United States
Department of
Agriculture

Natural
Resources
Conservation
Service

In cooperation with
Arkansas Agricultural
Experiment Station

Soil Survey of Arkansas County, Arkansas

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How To Use This Soil Survey

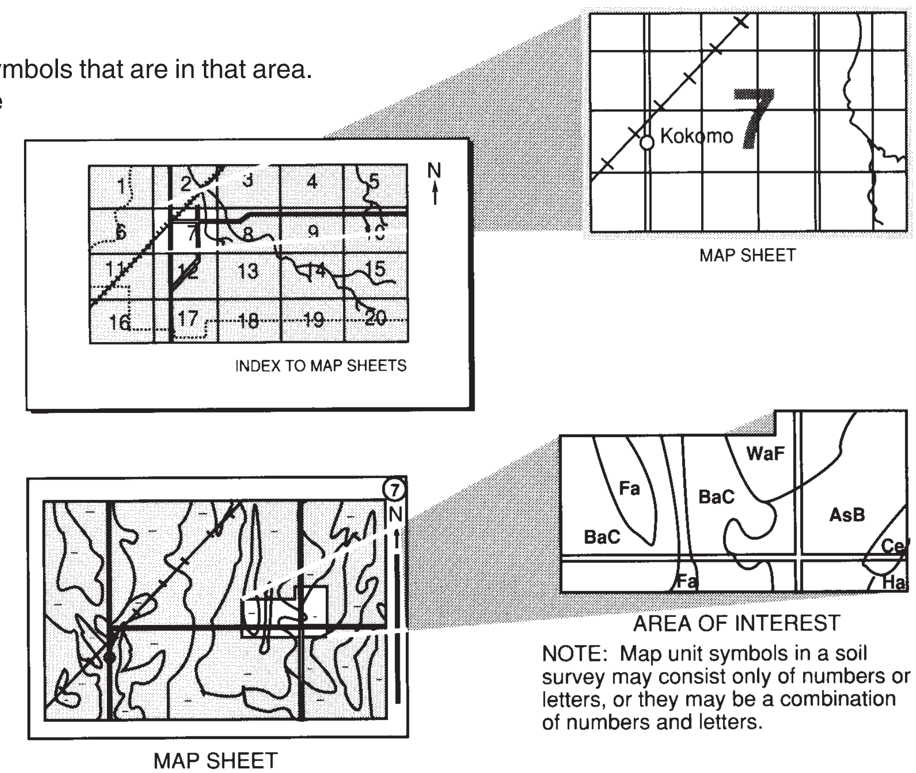
Detailed Soil Maps

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

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

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

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



NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

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

Major fieldwork for this soil survey was completed in 1995. Soil names and descriptions were approved in 1995. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1995. This survey was made cooperatively by the Natural Resources Conservation Service and the Arkansas Agricultural Experiment Station. The survey is part of the technical assistance furnished to the Arkansas County Soil and Water Conservation District.

Cover: Rice field in an area of Stuttgart silt loam, 0 to 1 percent slopes.

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Foreword

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

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

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. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

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Soil Survey of
Arkansas County, Arkansas

By Cornelius Harris, Kenneth Crader, and Edgar Mersiovsky, Natural Resources Conservation Service

Fieldwork by Cornelius Harris, Kenneth Crader, Edgar Mersiovsky, Richard Joslin, and Leander Brown, Natural Resources Conservation Service

United States Department of Agriculture, Natural Resources Conservation Service, in cooperation with
Arkansas Agricultural Experiment Station

This soil survey updates the survey of Arkansas County published in 1972 (USDA, 1972). It provides additional information and has larger maps, which show the soils in greater detail.

ARKANSAS COUNTY is in the southeastern part of Arkansas (fig. 1). It is about 60 miles from north to south and about 40 miles from east to west. The county has a total of 661,357 acres, or 1,033 square miles. This includes 16,650 acres of large bodies of water, which are more than 40 acres in size, including streams that are more than one-eighth of a mile wide. The total land area is about 644,707 acres. The County is bordered on the north by Lonoke, Monroe, and Prairie Counties, on the south by Desha County, on the east by Desha, Monroe, and Phillips Counties, and on the west by Jefferson, Lincoln, and Prairie Counties.

In 1990, the population of Arkansas County was 21,653. DeWitt, with a population of 3,553, and Stuttgart, with a population of 10,420, are the county seats. Gillett, with a population of 883, is also an important trading center.

Arkansas County is the first capital of the Arkansas Territory and the first European settlement west of the Mississippi River. The county is famous for its excellent hunting and fishing and notable for duck hunting. Stuttgart is known as the “Duck and Rice Capital of the World.”

The economy of Arkansas County is based mainly on farming. Except for a few manufacturing plants and large granaries, the local businesses provide agricultural services.

Figure 1.—Location of Arkansas County in Arkansas.

General Nature of the County

This section discusses farming, the geomorphology, the physiography and drainage, and the climate in Arkansas County.

Farming

Before the advent of the rice industry, settlers tended to avoid the Grand Prairie because land that would not grow trees was not suited for agriculture. Hence, early settlers founded trading posts, such as Casscoe on the White River that bounded the prairie on the east, or founded shaded spots along the Bayou Meto on the west where enough land could be cleared to grow a little corn, oats, and an acre or two of cotton to provide a little cash income. Cattle were grazed on the open prairie, and the prairie grasses were mowed and resulting hay sold; otherwise, the prairie was left undisturbed. Prairie land is not suitable for cotton and, as a result, hay became the first cash crop on the prairie.

In 1904, the first successful rice crop was grown on the prairie, and in 1907, the first rice mill began operation in Stuttgart, setting the precedent that was to make the community. Rice is still the major crop grown in the county, along with soybeans, wheat, and oats. Also, grain sorghum and corn are important crops grown. A few farmers raise catfish, truck crops, and beef cattle along with their row crop operations.

According to the 1992 Census of Agriculture, about 71 percent of Arkansas County was in farms. The rest consisted of wooded tracts, state- and federally-owned land, towns, transportation, and utility facilities.

Farms in Arkansas County are decreasing in number and increasing in size. Between 1987 and 1992, the number of farms decreased from 676 to 572. During the same period, the average farm size increased from 700 acres to 795 acres.

Most farms in Arkansas County are large enough to require hired laborers. The larger farms are operated by laborers who are supervised by an owner, manager, or tenant. Tenants pay a fix rent or percentage of the crop for use of the land. Most of the land is farmed by operators who are highly efficient and use the latest technologies available.

Geomorphology

Most of Arkansas County is located in the geomorphic division of the Lower Mississippi Valley known as the Grand Prairie, which is a portion of the Prairie Terrace Complex (Saucier, 1994). The Grand Prairie is a relic alluvial plain of the Arkansas River. The extreme northeastern portion of the county is located on the Deweyville Complex, which is slightly lower in elevation and also derived from the Arkansas River. The extreme western and southern portions of Arkansas County consist of the present flood plains of the Arkansas River. The extreme eastern portion of the county lies within the flood plains of the White River. Along the southeastern portion of the Grand Prairie are small areas of Pleistocene age valley train terraces deposited by an ancestor of the Mississippi River. These terraces are higher in elevation than the White River flood plains, but lower than the Grand Prairie. The principal drainage of the county includes the Arkansas River, White River, Bayou Meto, and LaGrue Bayou.

The regional slope of the county is to the south. The lowest elevation from east to west varies little, except on the flood plains where the consistently flattest terrain occurs on the flood plains of the Arkansas and White Rivers.

The events that led to the development of the Grand Prairie have been under discussion by several researchers. Most agree that the Arkansas River is the base for the Grand Prairie with the evidence of its characteristic red alluvium. The origin of the upper (browner) portion of the terrace has been somewhat uncertain. One theory suggests that the upper portion is windblown silts or loess derived from the Mississippi River which blanketed the Grand Prairie and became the parent material for the soils (Saucier, 1974 and 1994). Research has shown that the Mississippi River was not a source for loess across the Grand Prairie and suggests an alluvial nature of the soils (Mersiovsky, 1993). Channel scars and reddish colors in some soil horizons in the upper portions of some soils on the Grand Prairie also support this theory.

There are three major land resource areas in Arkansas County. These areas include the Southern Mississippi River Terraces, Arkansas River Alluvium, and the Southern Mississippi River Alluvium.

The Southern Mississippi River Terraces major land resource area is the most extensive area and includes the Grand Prairie, the Deweyville terrace, and the Pleistocene age valley train terraces. Erosional surfaces occur on the eastern side of the Grand Prairie. This area has the steepest slopes in the county. Slope gradients range from 1 to 20 percent. The elevation ranges from 207 feet at Crocketts Bluff to 179 feet at Nady. This area has about 5 to 12 feet of silty material underlain by Arkansas River alluvium.

The central portion of Arkansas County is made up of the Grand Prairie and the flood plains of Bayou LaGrue, Point Deuce Bayou, and Mills Bayou. The elevation ranges from 219 feet at Stuttgart to 1,778 feet in the southern part of the county. Slopes range from 0 to 8 percent.

The Grand Prairie is composed of the upper silty material underlain by red clayey subsoil. The major soils on the Grand Prairie are the Dewitt and Stuttgart soils. The soils are easily managed, except for some Stuttgart soils that have high sodium and salts in the subsoil. The presence of large concentrations of sodium salts dissolved in water and brought into contact with plant roots will cause the plant cells to erupt. This action, which is called plasmolysis, will cause the plant to wilt or the plant will finally die. Depths to the sodium layers should be determined before land leveling or cuts are made into the soil.

According to historical records, the Grand Prairie area was a tall grass prairie interlaced with woodlands. The wooded area, consisting mostly of bottomland species, occurred along the streamways and as islands in low areas. The prairie remained this way until 1904. This is when rice was introduced. There are several theories as to why the prairie remained almost treeless for thousands of years. The most logical theory is because of fires from lightning or those set by natives. Another factor that may have helped keep woody plants in check is the grazing of the bison herds and other animals.

The Deweyville terrace exists on the west side of the Grand Prairie. It lies topographically lower than the adjacent Prairie terrace and higher than the adjacent Holocene flood plain of the Arkansas River. It is about 15 miles long and 2 miles wide at the north and 4 miles wide at the south. The elevation ranges from 200 feet in the north to 189 feet in the south. It lies about 10 to 15 feet lower than the Grand Prairie and about 10 to 15 feet higher than the Arkansas River flood plain. It is dissected by abandoned Arkansas River tributaries and is of Pleistocene age. The soils consist of silty upper layer underlain by clayey Arkansas River deposits. The soils are somewhat poorly drained to moderately well drained. Slopes range from 0 to 5 percent.

The Pleistocene age valley train terraces in the southeastern part of the county lie about 30 feet below the adjacent Grand Prairie to the west and about 10 to 15 feet above the adjacent White River flood plain to the east. The length of the terraces is 7 miles from north to south, and the width is 2 miles from east to west. The elevation ranges from 160 feet in the north to 155 feet in the south. Slopes range from 0 to 3 percent. The soils are poorly drained to well drained, very deep, clayey and loamy. The Pleistocene age terraces are not subject to flooding.

A sublevel or lower terrace is adjacent to the Pleistocene valley train terraces on the south. The elevation is 5 feet lower and 10 feet higher than the adjacent White River flood plain. The elevation ranges from 150 feet to 148 feet. Slopes range from 0 to 2 percent. The deposits are clayey and loamy Pleistocene age alluvium. This terrace level is subject to frequent flooding. This lower terrace area is in woodland and is managed by the White River National Wildlife Refuge.

The Arkansas River is a meandering stream that flows southeasterly along the western and southern part of the county and empties into the Mississippi River east of Watson in Desha County. This area is within the Arkansas River Alluvium major land resource area. The channel belt is composed of alluvial deposits of Holocene age. The soils on the older stream terraces that lie farther from the present channel are Pleistocene in age and have developed argillic horizons.

The White River is a meandering stream that flows southward along the eastern side of the county and empties into the Mississippi River south of Lock and Dam Number 1. This area is part of the Southern Mississippi River Alluvium major land resource area. Its meander belt ranges from 6 miles wide at the northern part of the county to 9 miles wide at the southernmost part. The area floods annually for long periods. Almost all of the area is in woodland managed by the White River National Wildlife Refuge. The soils are very poorly drained to somewhat poorly drained and are loamy and clayey. Slopes range from 0 to 3 percent. The channel belt is composed of alluvial deposits of Holocene age.

Physiography and Drainage

The geologic deposits at the surface of Arkansas County are unconsolidated alluvium. Topographically, Arkansas County can be divided into three main regions: (1) the level to gently sloping Prairie Terrace or Grand Prairie in the central portion, (2) the level to moderately steep Prairie Terrace in the east-central portion, and (3) the flood plain areas.

The topography of the flood plains ranges from broad flat areas to nearly level and gently sloping natural levees in the western, eastern, and southern parts of the county. Parts of the area in the western part of the county are protected from flooding by levees. In the flood plain area, slope differences are generally less than 1 percent on the flats and range to 6 percent on side slopes.

In the Prairie Terrace region, the topography ranges from broad flats to gently sloping ridges and flood plains along natural drains. Slopes generally range from less than 1 percent to 8 percent. Parts of the area are protected from flooding by levees.

In the eastern portion of the Prairie Terrace, the topography is characterized by broad flats to moderately steep ridges and has narrow winding drainageways. Slopes generally range from 0 to 20 percent.

Drainage in the eastern part of Arkansas County is generally through a system of natural drainageways.

The major drainageway in the eastern part of the county is the White River.

The White River is a meandering stream with a well defined channel flowing south. The flow is regulated by major flood-control impoundments upstream from Arkansas County. It is open to barge traffic the year round. This river, along with its many oxbow lakes, also provides recreation in the form of fishing and hunting. Fish are removed in commercial quantities. About half the stream watersheds of Arkansas County drain into this river. Flooding occurs during the winter or spring almost every year along the White River and its tributaries. The surface water drains from the area through natural drains that follow the course of former river channels. The elevation in these areas ranges from about 156 feet at Preston Ferry north to 140 feet at Lock and Dam Number 1 south.

The central and east central part of the county is drained by Bayou LaGrue, Little LaGrue, and many artificial drains. Flooding occurs annually during winter and spring in low-lying areas along streams. The widespread use of ground water for all crops grown in the area has resulted in the drilling of several hundred wells and the construction of many large reservoirs and canals. When the first wells were drilled, the water was abundant, and because it was under artesian pressure, it rose upward in the well pipe to the surface. However, by 1916 more water was being withdrawn than was being recharged through natural processes. By 1930, many wells were declining at a rate of 1 foot per year, and some had gone dry. Today, the problem is acute as more wells continue to dry. Reservoirs offer an additional advantage of providing habitat for fish and migratory waterfowl.

The western and southern parts of the county are drained by the Arkansas River, Bayo Meto, Crooked Creek, Little Bayou Meto, and other natural and artificial drainage systems.

The Arkansas River is a meandering stream with a well defined channel flowing southeast. The flow is regulated by a series of locks and dams. It is open to barge traffic the year round. This river, along with its many oxbow lakes, also provides recreation in the form of fishing and hunting. Fish are removed in commercial quantities. The western part of the county is protected from flooding by a levee system, although some flooding in the backswamp areas from smaller streams may occur. The southern part of the county is subject to annual flooding from the Arkansas River.

Most of the land along the Arkansas River is cleared. Large tracts of woodland remain and are managed by private owners and used as animal refuge areas.

Climate

Table 1 gives data on temperature and precipitation for the survey area as recorded at Stuttgart 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 length of the growing season.

In winter, the average temperature is 44 degrees F and the average daily minimum temperature is 34 degrees. The lowest temperature on record, which occurred on January 18, 1930, is -8 degrees. In summer, the average temperature is 80 degrees and the average daily maximum temperature is 91 degrees. The highest recorded temperature, which occurred on July 29, 1930, is 112 degrees.

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

The total annual precipitation is about 49 inches. Of this, 37 inches, or 74 percent, usually falls in March through November. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period of record was 6 inches on February 10, 1966. Thunderstorms occur on about 57 days each year, and most occur between April and August.

The average seasonal snowfall is about 5 inches. The greatest snow depth at any one time during the period of record was 10 inches. On the average, 3 days of the year have at least 1 inch of snow on the ground. The number of such days varies greatly from year to year. The heaviest 1-day snowfall on record was 11 inches on January 7, 1988.

The average relative humidity in midafternoon is about 57 percent. Humidity is higher at night, and the average at dawn is about 84 percent. The sun shines 72 percent of the time possible in summer and 50 percent in winter. The prevailing wind is from the southwest. Average windspeed is highest, around 9 miles per hour, from February to April.

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 high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

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

Table 1.--Temperature and Precipitation

(Recorded in the period 1971-2000 at Stuttgart, Arkansas)

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January	49.3	31.8	40.5	78	10	51	3.88	2.02	5.51	6	2.4
February	57.1	35.5	46.3	78	16	76	3.73	2.10	5.18	5	1.9
March	66.5	44.7	55.6	86	23	228	5.34	3.17	7.29	7	0.5
April	75.6	52.4	64.0	89	32	425	5.14	2.30	7.56	6	0.0
May	82.0	60.3	71.2	95	45	656	5.02	2.68	7.07	7	0.0
June	89.2	68.2	78.7	99	55	861	3.88	1.77	5.69	5	0.0
July	92.9	71.9	82.4	102	59	1005	3.15	1.28	4.72	5	0.0
August	90.5	69.6	80.1	98	59	932	2.33	0.71	3.64	3	0.0
September	84.5	64.7	74.6	98	45	737	3.05	1.62	4.30	5	0.0
October	76.8	52.7	64.7	92	35	462	3.89	1.78	5.70	4	0.0
November	61.8	42.6	52.2	82	22	164	4.85	2.70	6.75	6	0.3
December	53.9	35.8	44.9	74	14	53	5.19	2.76	7.31	6	0.1
Yearly:											
Average	73.4	52.5	62.9	---	---	---	---	---	---	---	---
Extreme	103	5	---	102	9	---	---	---	---	---	---
Total	---	---	---	---	---	5,652	49.43	42.44	55.71	65	5.2

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minumum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 degrees F).

Table 2.--Freeze Dates in Spring and Fall

(Recorded in the period 1971-2000 at Stuttgart, Arkansas)

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 28	March 21	April 13
2 years in 10 later than--	February 24	March 14	April 5
5 years in 10 later than--	February 16	March 1	March 21
First freezing temperature in fall:			
1 year in 10 earlier than--	November 17	November 5	November 4
2 years in 10 earlier than--	November 24	November 10	November 7
5 years in 10 earlier than--	December 7	November 21	November 12

Table 3.--Growing Season

(Recorded in the period 1971-2000 at Stuttgart, Arkansas)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	279	242	210
8 years in 10	284	249	219
5 years in 10	293	263	235
2 years in 10	303	277	251
1 year in 10	308	284	260

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, Dubbs silt loam, 0 to 3 percent slopes, is a phase of the Dubbs series.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Riverwash, sandy, frequently flooded, 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.

Soil Descriptions

1C—Crevasse loamy fine sand, 0 to 5 percent slopes, occasionally flooded

Setting

Landscape: Arkansas River valley
Landform: Natural levee

Typical Profile

Surface layer:
0 to 4 inches—dark brown loamy fine sand

Substratum:
4 to 16 inches—yellowish brown sand
16 to 35 inches—pale brown sand
35 to 72 inches—grayish brown sand

Minor Components

- Miscellaneous wet areas
- Riverwash miscellaneous areas

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Excessively drained
Permeability: Rapid
Available water capacity: Very low
Depth to seasonal high water table: More than 6 feet throughout the year
Shrink-swell potential: Low
Hazard of flooding: Occasional, very brief duration, December through April
Surface runoff: Negligible
Soil reaction: Moderately acid to neutral throughout
Parent material: Sandy alluvium

Land Use

Major uses: Most areas are cultivated; a few areas are in woodland

Cropland

Land capability: 4s
Suitability: Poorly suited or not suited
Adapted crops: None
Management concerns:
- Occasional flooding
- Droughtiness
- Soil blowing

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Pasture and Hayland

Suitability: Moderately suited
Adapted plants: Bermudagrass
Management concerns:
- Occasional flooding
- Droughtiness
- Soil blowing

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Other Uses

Forest Management
Recreation
Wildlife Habitat
Urban Uses
Water Management
Waste Management
- See Use and Management of the Soils, Forest Productivity and Management, Recreation, Wildlife Habitat, and Engineering sections

2B—Desha silty clay, 0 to 3 percent slopes, occasionally flooded

Setting

Landscape: Arkansas River valley
Landform: Flood plain

Typical Profile

Surface layer:
0 to 9 inches—dark reddish brown silty clay

Subsoil:
9 to 28 inches—dark reddish brown clay
28 to 54 inches—dark reddish brown clay with brown iron depletions
54 to 80 inches—reddish brown clay with reddish brown iron depletions

Minor Components

- Perry soils
- Portland soils
- Miscellaneous wet areas

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Very slow
Available water capacity: High
Depth to seasonal high water table: Saturated 0 to 1.5 feet from December through April and moist in all underlying layers

Shrink-swell potential: High
Hazard of flooding: Occasional, brief duration, December through April
Surface runoff: Negligible to very high
Soil reaction: Slightly acid to slightly alkaline in the surface layer; neutral to moderately alkaline in the subsoil
Parent material: Clayey alluvium

Land Use

Major uses: Most areas are cultivated; a few areas are in woodland

Cropland

Land capability: 3w
Suitability: Poorly suited
Adapted crops: Soybeans
Management concerns:
- Occasional flooding
- Seasonal wetness

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Pasture and Hayland

Suitability: Moderately suited
Adapted plants: Bermudagrass and tall fescue
Management concerns:
- Occasional flooding
- Seasonal wetness

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Other Uses

Forest Management
Recreation
Wildlife Habitat
Urban Uses
Water Management
Waste Management
- See Use and Management of the Soils, Forest Productivity and Management, Recreation, Wildlife Habitat, and Engineering sections

3A—Dewitt silt loam, 0 to 1 percent slopes

Setting

Landscape: Grand Prairie upland
Landform: Stream terrace

Typical Profile

Surface layer:
0 to 7 inches—dark grayish brown silt loam

Subsurface layer:
7 to 15 inches—grayish brown silt loam with dark yellowish brown and dark brown iron concentrations
15 to 22 inches—light brownish gray silt loam with dark yellowish brown iron concentrations

Subsoil:
22 to 33 inches—gray silty clay loam with red and brown iron concentrations
33 to 53 inches—grayish brown silty clay loam with brown and yellowish brown iron concentrations
53 to 80 inches—light brownish gray silty clay loam with strong brown and yellowish brown iron accumulations

Minor Components

- Ethel soils
- Lagrue soils
- Stuttgart soils
- Miscellaneous wet areas

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Slow
Available water capacity: High
Depth to seasonal high water table: Saturated 0.5 foot to 1.5 feet from December through April and moist in all underlying layers
Shrink-swell potential: High
Hazard of flooding: None
Surface runoff: Negligible to medium
Soil reaction: Very strongly acid to moderately acid in the surface and subsurface layers, except where limed or irrigated; very strongly acid to slightly acid in the subsoil
Parent material: Loamy alluvium

Land Use

Major uses: Most areas are cultivated; a few areas are in woodland

Cropland

Land capability: 3w
Suitability: Moderately suited
Adapted crops: Rice, soybeans, and grain sorghum
Management concerns:
- Seasonal wetness

Management measures:
• See Use and Management of the Soils, Crops and Pasture section

Pasture and Hayland

Suitability: Moderately suited
Adapted plants: Bermudagrass and tall fescue
Management concerns:
• Seasonal wetness
Management measures:
• See Use and Management of the Soils, Crops and Pasture section

Other Uses

Forest Management
Recreation
Wildlife Habitat
Urban Uses
Water Management
Waste Management
• See Use and Management of the Soils, Forest Productivity and Management, Recreation, Wildlife Habitat, and Engineering sections

4B—Dubbs silt loam, 0 to 3 percent slopes

Setting

Landscape: White River valley
Landform: Natural levee

Typical Profile

Surface layer:
0 to 5 inches—brown silt loam

Subsoil:
5 to 44 inches—dark brown silty clay loam
44 to 58 inches—dark brown loam with pale brown iron depletions

Substratum:
58 to 80 inches—dark yellowish brown fine sandy loam with light brownish gray iron depletions

Minor Components

• Miscellaneous wet areas

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: High
Depth to seasonal high water table: More than 6 feet throughout the year
Shrink-swell potential: Moderate
Hazard of flooding: None
Surface runoff: Negligible to low
Soil reaction: Very strongly acid to moderately acid throughout, except where limed or irrigated
Parent material: Loamy alluvium

Land Use

Major uses: Most areas are cultivated; a few areas are in woodland

Cropland

Land capability: 2e
Suitability: Well suited
Adapted crops: Soybeans, corn, cotton, grain sorghum, and winter small grains
Management concerns:
• Moderate erosion hazard
Management measures:
• See Use and Management of the Soils, Crops and Pasture section

Pasture and Hayland

Suitability: Well suited
Adapted plants: Bermudagrass and tall fescue
Management concerns:
• Moderate erosion hazard
Management measures:
• See Use and Management of the Soils, Crops and Pasture section

Other Uses

Forest Management
Recreation
Wildlife Habitat
Urban Uses
Water Management
Waste Management
• See Use and Management of the Soils, Forest Productivity and Management, Recreation, Wildlife Habitat, and Engineering sections

5B—Dundee silt loam, 0 to 2 percent slopes, occasionally flooded

Setting

Landscape: White River valley
Landform: Natural levee

Typical Profile

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

Subsoil:
4 to 10 inches—dark grayish brown silt loam with dark yellowish brown iron concentrations
10 to 19 inches—grayish brown silty clay loam with strong brown iron concentrations
19 to 30 inches—dark grayish brown silty clay loam with strong brown iron concentrations
30 to 40 inches—grayish brown silt loam with strong brown iron concentrations
40 to 60 inches—dark grayish brown loam with brown iron concentrations

Substratum:
60 to 72 inches—gray fine sandy loam with yellowish brown iron concentrations

Minor Components

- Forestdale soils
- Miscellaneous wet areas

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Available water capacity: High
Depth to seasonal high water table: Saturated 1.5 to 3.5 feet from December through April and saturated in all underlying layers
Shrink-swell potential: Moderate
Hazard of flooding: Occasional, brief duration, December through April
Surface runoff: Negligible to medium
Soil reaction: Strongly acid or moderately acid in the surface layer; very strongly acid to moderately acid in the subsoil; very strongly acid to neutral in the substratum
Parent material: Loamy alluvium

Land Use

Major uses: Most areas are cultivated; a few areas are in woodland

Cropland

Land capability: 3w
Suitability: Poorly suited
Adapted crops: Soybeans
Management concerns:
- Occasional flooding
- Seasonal wetness

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Pasture and Hayland

Suitability: Moderately suited
Adapted plants: Bermudagrass and tall fescue
Management concerns:
- Occasional flooding
- Seasonal wetness

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Other Uses

Forest Management
Recreation
Wildlife Habitat
Urban Uses
Water Management
Waste Management
- See Use and Management of the Soils, Forest Productivity and Management, Recreation, Wildlife Habitat, and Engineering sections

6A—Ethel silt loam, 0 to 1 percent slopes

Setting

Landscape: Grand Prairie upland
Landform: Stream terrace

Typical Profile

Surface layer:
0 to 5 inches—grayish brown silt loam with brown iron concentrations

Subsurface layer:
5 to 13 inches—gray silt loam with strong brown iron concentrations
13 to 24 inches—light brownish gray silt loam with yellowish brown iron concentrations

Subsoil:
24 to 38 inches—60 percent dark gray silty clay loam with yellowish brown iron concentrations; 40 percent light brownish gray silt
38 to 52 inches—85 percent grayish brown silty clay loam with yellowish brown iron concentrations and dark gray iron depletions; 15 percent light brownish gray silt
52 to 64 inches—grayish brown silty clay loam with yellowish brown and dark yellowish brown iron concentrations and light brownish gray clay depletions
64 to 80 inches—grayish brown silty clay loam with yellowish brown and brown iron concentrations and light brownish gray clay depletions

Minor Components

- Miscellaneous wet areas

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Slow
Available water capacity: High
Depth to seasonal high water table: Saturated 0 to 2 feet from December through April and moist in all underlying layers
Shrink-swell potential: Moderate
Hazard of flooding: None
Surface runoff: Negligible to medium
Soil reaction: Strongly acid or moderately acid in the surface and subsurface layers; very strongly acid to moderately acid in the subsoil
Parent material: Silty alluvium

Land Use

Major uses: Most areas are cultivated; a few areas are in woodland

Cropland

Land capability: 3w
Suitability: Moderately suited
Adapted crops: Soybeans, grain sorghum, and rice
Management concerns:
- Seasonal wetness

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Pasture and Hayland

Suitability: Moderately suited
Adapted plants: Tall fescue and bermudagrass
Management concerns:
- Seasonal wetness

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Other Uses

Forest Management
Recreation
Wildlife Habitat
Urban Uses
Water Management
Waste Management
- See Use and Management of the Soils, Forest Productivity and Management, Recreation, Wildlife Habitat, and Engineering sections

7A—Forestdale silty clay loam, 0 to 1 percent slopes, frequently flooded

Setting

Landscape: White River valley
Landform: Stream terrace

Typical Profile

Surface layer:
0 to 5 inches—dark grayish brown silty clay loam

Subsoil:
5 to 20 inches—light gray silty clay with strong brown and yellowish brown iron concentrations
20 to 39 inches—gray silty clay with strong brown iron concentrations
39 to 60 inches—light brownish gray silty clay loam with yellowish brown iron concentrations
60 to 80 inches—grayish brown silty clay loam with yellowish brown iron concentrations

Minor Components

- Overcup soils
- Miscellaneous wet areas

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Very slow
Available water capacity: Moderate
Depth to seasonal high water table: Saturated 0.5 foot to 2 feet from December through April and saturated in all underlying layers
Shrink-swell potential: High
Hazard of flooding: Frequent, long duration, December through April
Surface runoff: Negligible to high
Soil reaction: Strongly acid or moderately acid in the surface layer; very strongly acid to moderately acid in the subsoil
Parent material: Clayey alluvium

Land Use

Major uses: Most areas are cultivated; a few areas are in woodland

Cropland

Land capability: 4w
Suitability: Poorly suited
Adapted crops: Soybeans
Management concerns:
- Frequent flooding
- Seasonal wetness

Management measures:
• See Use and Management of the Soils, Crops and Pasture section

Pasture and Hayland

Suitability: Moderately suited
Adapted plants: Tall fescue and bermudagrass
Management concerns:
• Frequent flooding
• Seasonal wetness
Management measures:
• See Use and Management of the Soils, Crops and Pasture section

Other Uses

Forest Management
Recreation
Wildlife Habitat
Urban Uses
Water Management
Waste Management
• See Use and Management of the Soils, Forest Productivity and Management, Recreation, Wildlife Habitat, and Engineering sections

8A—Hebert silt loam, 0 to 1 percent slopes

Setting

Landscape: Arkansas River valley
Landform: Natural levee

Typical Profile

Surface layer:
0 to 4 inches—brown silt loam

Subsoil:
4 to 12 inches—brown silt loam with grayish brown iron depletions and light brownish gray clay depletions
12 to 20 inches—brown silt loam with light brownish gray clay depletions
20 to 34 inches—reddish brown silty clay loam with light brownish gray clay depletions
34 to 50 inches—reddish brown silty clay loam with grayish brown clay depletions

Substratum:
50 to 72 inches—brown silt loam

Minor Components

• Portland soils
• Rilla soils
• Miscellaneous wet areas

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Available water capacity: High
Depth to seasonal high water table: Saturated 1.5 to 3 feet from December through April and saturated in all underlying layers
Shrink-swell potential: Moderate
Hazard of flooding: None
Surface runoff: Negligible to low
Soil reaction: Strongly acid to slightly acid in the surface layer (and subsurface layer when present); very strongly acid to slightly acid in the subsoil; strongly acid to slightly alkaline in the substratum
Parent material: Silty alluvium

Land Use

Major uses: Most areas are cultivated; a few areas are in woodland

Cropland

Land capability: 2w
Suitability: Well suited
Adapted crops: Soybeans, cotton, rice, grain sorghum, and winter small grains
Management concerns:
• Seasonal wetness
Management measures:
• See Use and Management of the Soils, Crops and Pasture section

Pasture and Hayland

Suitability: Moderately suited
Adapted plants: Tall fescue and bermudagrass
Management concerns:
• Seasonal wetness
Management measures:
• See Use and Management of the Soils, Crops and Pasture section

Other Uses

Forest Management
Recreation
Wildlife Habitat
Urban Uses
Water Management
Waste Management
• See Use and Management of the Soils, Forest Productivity and Management, Recreation, Wildlife Habitat, and Engineering sections

9A—Immanuel silt loam, 0 to 1 percent slopes

Setting

Landscape: Grand Prairie upland
Landform: Terrace

Typical Profile

Surface layer:
0 to 7 inches—brown silt loam with brown iron depletions

Subsoil:
7 to 18 inches—strong brown silty clay loam with brown accumulations
18 to 28 inches—yellowish brown silty clay loam with yellowish brown iron concentrations and brown iron depletions
28 to 33 inches—light brownish gray silt loam with yellowish brown iron concentrations
33 to 53 inches—60 percent yellowish brown silt loam with yellowish brown and strong brown iron concentrations and brown and light brownish gray iron depletions; 40 percent light brownish gray silt
53 to 80 inches—yellowish brown silt loam with yellowish brown and strong brown iron concentrations, brown iron depletions, and light brownish gray clay depletions

Minor Components

- Ethel soils
- Miscellaneous wet areas

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate above the fragic layer and slow in the fragic layer
Available water capacity: High
Depth to seasonal high water table: Saturated 1.5 to 2.5 feet from December through April and moist in all underlying layers
Shrink-swell potential: Low
Hazard of flooding: None
Surface runoff: Negligible to low
Soil reaction: Strongly acid or moderately acid in the surface layer; very strongly acid or strongly acid in the upper part of the subsoil; very strongly acid to slightly acid in the lower part of the subsoil
Parent material: Loess influenced alluvium

Land Use

Major uses: Most areas are cultivated; a few areas are in woodland

Cropland

Land capability: 2w
Suitability: Well suited
Adapted crops: Rice, soybeans, grain sorghum, cotton, and winter small grains
Management concerns:
- Seasonal wetness

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Pasture and Hayland

Suitability: Well suited
Adapted plants: Bermudagrass and tall fescue
Management concerns:
- None

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Other Uses

Forest Management
Recreation
Wildlife Habitat
Urban Uses
Water Management
Waste Management
- See Use and Management of the Soils, Forest Productivity and Management, Recreation, Wildlife Habitat, and Engineering sections

9B—Immanuel silt loam, 1 to 3 percent slopes

Setting

Landscape: Grand Prairie upland
Landform: Terrace

Typical Profile

Surface layer:
0 to 7 inches—brown silt loam with brown iron depletions

Subsoil:
7 to 18 inches—strong brown silty clay loam with brown accumulations
18 to 28 inches—yellowish brown silty clay loam with yellowish brown iron concentrations and brown iron depletions
28 to 33 inches—light brownish gray silt loam with yellowish brown iron concentrations
33 to 53 inches—60 percent yellowish brown silt loam with yellowish brown and strong brown iron

concentrations and brown and light brownish gray iron depletions; 40 percent light brownish gray silt
53 to 80 inches—yellowish brown silt loam with yellowish brown and strong brown iron concentrations, brown iron depletions, and light brownish gray clay depletions

Minor Components

- Ethel soils
- Miscellaneous wet areas

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate above the fragic layer and slow in the fragic layer
Available water capacity: High
Depth to seasonal high water table: Saturated 1.5 to 2.5 feet from December through April and moist in all underlying layers
Shrink-swell potential: Low
Hazard of flooding: None
Surface runoff: Medium
Soil reaction: Strongly acid or moderately acid in the surface layer; very strongly acid or strongly acid in the upper part of the subsoil; very strongly acid to slightly acid in the lower part of the subsoil
Parent material: Loess influenced alluvium

Land Use

Major uses: Most areas are cultivated; a few areas are in woodland

Cropland

Land capability: 2e
Suitability: Well suited
Adapted crops: Soybeans, grain sorghum, cotton, and winter small grains
Management concerns:
- Seasonal wetness
- Moderate erosion hazard

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Pasture and Hayland

Suitability: Well suited
Adapted plants: Bermudagrass and tall fescue
Management concerns:
- Moderate erosion hazard

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Other Uses

Forest Management
Recreation
Wildlife Habitat
Urban Uses
Water Management
Waste Management
- See Use and Management of the Soils, Forest Productivity and Management, Recreation, Wildlife Habitat, and Engineering sections

9C—Immanuel silt loam, 3 to 8 percent slopes

Setting

Landscape: Grand Prairie upland
Landform: Terrace

Typical Profile

Surface layer:
0 to 7 inches—brown silt loam with brown iron depletions

Subsoil:
7 to 18 inches—strong brown silty clay loam with brown accumulations
18 to 28 inches—yellowish brown silty clay loam with yellowish brown iron concentrations and brown iron depletions
28 to 33 inches—light brownish gray silt loam with yellowish brown iron concentrations
33 to 53 inches—60 percent yellowish brown silt loam with yellowish brown and strong brown iron concentrations and brown and light brownish gray iron depletions; 40 percent light brownish gray silt
53 to 80 inches—yellowish brown silt loam with yellowish brown and strong brown iron concentrations, brown iron depletions, and light brownish gray clay depletions

Minor Components

- Ethel soils
- Miscellaneous wet areas

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate above the fragic layer and slow in the fragic layer
Available water capacity: High
Depth to seasonal high water table: Saturated 1.5 to 2.5 feet from December through April and moist in all underlying layers

Shrink-swell potential: Low
Hazard of flooding: None
Surface runoff: Medium to high
Soil reaction: Strongly acid or moderately acid in the surface layer: very strongly acid or strongly acid in the upper part of the subsoil; very strongly acid to slightly acid in the lower part of the subsoil
Parent material: Loess influenced alluvium

Land Use

Major uses: Most areas are cultivated; a few areas are in woodland

Cropland

Land capability: 3e
Suitability: Poorly suited
Adapted crops: Soybeans, grain sorghum, and winter small grains
Management concerns:
- Severe erosion hazard
- Seasonal wetness

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Pasture and Hayland

Suitability: Moderately suited
Adapted plants: Bermudagrass and tall fescue
Management concerns:
- Severe erosion hazard

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Other Uses

Forest Management
Recreation
Wildlife Habitat
Urban Uses
Water Management
Waste Management
- See Use and Management of the Soils, Forest Productivity and Management, Recreation, Wildlife Habitat, and Engineering sections

9D—Immanuel silt loam, 8 to 15 percent slopes

Setting

Landscape: Grand Prairie upland
Landform: Terrace

Typical Profile

Surface layer:
0 to 7 inches—brown silt loam with brown iron depletions

Subsoil:
7 to 18 inches—strong brown silty clay loam with brown accumulations
18 to 28 inches—yellowish brown silty clay loam with yellowish brown iron concentrations and brown iron depletions
28 to 33 inches—light brownish gray silt loam with yellowish brown iron concentrations
33 to 53 inches—60 percent yellowish brown silt loam with yellowish brown and strong brown iron concentrations and brown and light brownish gray iron depletions; 40 percent light brownish gray silt
53 to 80 inches—yellowish brown silt loam with yellowish brown and strong brown iron concentrations, brown iron depletions, and light brownish gray clay depletions

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate above the fragic layer and slow in the fragic layer
Available water capacity: High
Depth to seasonal high water table: Saturated 1.5 to 2.5 feet from December through April and moist in all underlying layers
Shrink-swell potential: Low
Hazard of flooding: None
Surface runoff: High
Soil reaction: Strongly acid or moderately acid in the surface layer; very strongly acid or strongly acid in the upper part of the subsoil; very strongly acid to slightly acid in the lower part of the subsoil
Parent material: Loess influenced alluvium

Land Use

Major uses: Most areas are cultivated; a few areas are in woodland

Cropland

Land capability: 4e
Suitability: Not suited
Adapted crops: None
Management concerns:
- Very severe erosion hazard
- Slope

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Pasture and Hayland

Suitability: Moderately suited
Adapted plants: Bermudagrass and tall fescue
Management concerns:
• Very severe erosion hazard
Management measures:
• See Use and Management of the Soils, Crops and Pasture section

Other Uses

Forest Management
Recreation
Wildlife Habitat
Urban Uses
Water Management
Waste Management
• See Use and Management of the Soils, Forest Productivity and Management, Recreation, Wildlife Habitat, and Engineering sections

9E—Immanuel silt loam, 15 to 25 percent slopes

Setting

Landscape: Grand Prairie upland
Landform: Terrace

Typical Profile

Surface layer:
0 to 7 inches—brown silt loam with brown iron depletions

Subsoil:
7 to 18 inches—strong brown silty clay loam with brown accumulations
18 to 28 inches—yellowish brown silty clay loam with yellowish brown iron concentrations and brown iron depletions
28 to 33 inches—light brownish gray silt loam with yellowish brown iron concentrations
33 to 53 inches—60 percent yellowish brown silt loam with yellowish brown and strong brown iron concentrations and brown and light brownish gray iron depletions; 40 percent light brownish gray silt
53 to 80 inches—yellowish brown silt loam with yellowish brown and strong brown iron concentrations, brown iron depletions, and light brownish gray clay depletions

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate above the fragic layer and slow in the fragic layer
Available water capacity: High
Depth to seasonal high water table: Saturated 1.5 to 2.5 feet from December through April and moist in all underlying layers
Shrink-swell potential: Low
Hazard of flooding: None
Surface runoff: High
Soil reaction: Strongly acid or moderately acid in the surface layer; very strongly acid or strongly acid in the upper part of the subsoil; very strongly acid to slightly acid in the lower part of the subsoil
Parent material: Loess influenced alluvium

Land Use

Major uses: Most areas are cultivated; a few areas are in woodland

Cropland

Land capability: 6e
Suitability: Not suited
Adapted crops: None
Management concerns:
• Very severe erosion hazard
• Slope
Management measures:
• See Use and Management of the Soils, Crops and Pasture section

Pasture and Hayland

Suitability: Poorly suited
Adapted plants: Bermudagrass and tall fescue
Management concerns:
• Very severe erosion hazard
• Steep slope
Management measures:
• See Use and Management of the Soils, Crops and Pasture section

Other Uses

Forest Management
Recreation
Wildlife Habitat
Urban Uses
Water Management
Waste Management
• See Use and Management of the Soils, Forest Productivity and Management, Recreation, Wildlife Habitat, and Engineering sections

10A—Keo loam, 0 to 1 percent slopes, occasionally flooded

Setting

Landscape: Arkansas River valley
Landform: Natural levee

Typical Profile

Surface layer:
0 to 5 inches—dark brown loam

Subsoil:
5 to 19 inches—reddish brown very fine sandy loam
19 to 31 inches—reddish brown silt loam
31 to 39 inches—dark reddish brown silt loam
39 to 47 inches—reddish brown silt loam

Substratum:
47 to 60 inches—dark reddish brown silty clay loam
60 to 80 inches—reddish brown loam

Minor Components

- Hebert soils
- Miscellaneous wet areas

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: High
Depth to seasonal high water table: More than 6 feet throughout the year
Shrink-swell potential: Low
Hazard of flooding: Occasional, brief duration, December through April
Surface runoff: Negligible
Soil reaction: Slightly acid to slightly alkaline in the surface layer; neutral to moderately alkaline in the subsoil and substratum
Parent material: Loamy alluvium

Land Use

Major uses: Most areas are cultivated; a few areas are in woodland

Cropland

Land capability: 2w
Suitability: Well suited
Adapted crops: Cotton, corn, soybeans, and winter small grains
Management concerns:
- Occasional flooding

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Pasture and Hayland

Suitability: Well suited
Adapted plants: Bermudagrass and tall fescue
Management concerns:
- Occasional flooding

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Other Uses

Forest Management
Recreation
Wildlife Habitat
Urban Uses
Water Management
Waste Management
- See Use and Management of the Soils, Forest Productivity and Management, Recreation, Wildlife Habitat, and Engineering sections

10C—Keo loam, 1 to 6 percent slopes, occasionally flooded

Setting

Landscape: Arkansas River valley
Landform: Natural levee

Typical Profile

Surface layer:
0 to 5 inches—dark brown loam

Subsoil:
5 to 19 inches—reddish brown very fine sandy loam
19 to 31 inches—reddish brown loam
31 to 39 inches—dark reddish brown silt loam
39 to 47 inches—reddish brown silt loam

Substratum:
47 to 60 inches—dark reddish brown silty clay loam
60 to 80 inches—reddish brown loam

Minor Components

- Perry soils
- Portland soils
- Miscellaneous wet areas

Soil Properties and Qualities

Depth class: Very deep

Drainage class: Well drained
Permeability: Moderate
Available water capacity: High
Depth to seasonal high water table: More than 6 feet throughout the year
Shrink-swell potential: Low
Hazard of flooding: Occasional, brief duration, December through April
Surface runoff: Low
Soil reaction: Slightly acid to slightly alkaline in the surface layer; neutral to moderately alkaline in the subsoil and substratum
Parent material: Loamy alluvium

Land Use

Major uses: Most areas are cultivated; a few areas are in woodland

Cropland

Land capability: 2e
Suitability: Moderately suited
Adapted crops: Cotton, corn, soybeans, and small grains
Management concerns:
- Occasional flooding
- Moderate erosion hazard

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Pasture and Hayland

Suitability: Well suited
Adapted plants: Bermudagrass and tall fescue
Management concerns:
- Occasional flooding
- Moderate erosion hazard

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Other Uses

Forest Management
Recreation
Wildlife Habitat
Urban Uses
Water Management
Waste Management
- See Use and Management of the Soils, Forest Productivity and Management, Recreation, Wildlife Habitat, and Engineering sections

11A—Kobel silty clay, 0 to 1 percent slopes, frequently flooded

Setting

Landscape: White River valley
Landform: Backswamp

Typical Profile

Surface layer:
0 to 5 inches—dark grayish brown silty clay

Subsoil:
5 to 40 inches—gray clay with yellowish brown and dark yellowish brown iron concentrations
40 to 54 inches—gray clay with strong brown iron concentrations

Substratum:
54 to 72 inches—gray silty clay loam with strong brown iron concentrations

Minor Components

- Kobel soils
- Yancopin soils
- Miscellaneous wet areas

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Very slow
Available water capacity: High
Depth to seasonal high water table: Saturated 0 to 1 foot from December through April and saturated in all underlying layers
Shrink-swell potential: Very high
Hazard of flooding: Frequent, long duration, December through April
Surface runoff: Negligible to high
Soil reaction: Moderately acid to neutral in the surface layer; slightly acid to slightly alkaline in the subsoil; neutral to moderately alkaline in the substratum
Parent material: Clayey alluvium

Land Use

Major uses: Most areas are in woodland; a few areas are cultivated

Cropland

Land capability: 4w
Suitability: Poorly suited
Adapted crops: Soybeans

Management concerns:
- Frequent flooding
- Seasonal wetness

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Pasture and Hayland

Suitability: Moderately suited
Adapted plants: Bermudagrass and tall fescue
Management concerns:
- Frequent flooding
- Seasonal wetness

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Other Uses

Forest Management
Recreation
Wildlife Habitat
Urban Uses
Water Management
Waste Management
- See Use and Management of the Soils, Forest Productivity and Management, Recreation, Wildlife Habitat, and Engineering sections

12A—Kobel silty clay, ponded, 0 to 1 percent slopes, frequently flooded

Setting

Landscape: White River valley
Landform: Backswamp

Typical Profile

Surface layer:
0 to 5 inches—dark grayish brown silty clay

Subsoil:
5 to 40 inches—gray clay with yellowish brown and dark yellowish brown iron concentrations
40 to 54 inches—gray clay with strong brown iron concentrations

Substratum:
54 to 72 inches—gray silty clay loam with strong brown iron concentrations

Minor Components

- Kobel soils
- Yancopin soils
- Miscellaneous wet areas

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Very poorly drained
Permeability: Very slow
Available water capacity: High
Depth to seasonal high water table: Saturated 0 to 1 foot from September through June and saturated in all underlying layers
Shrink-swell potential: Very high
Hazard of flooding: Frequent, long duration, December through April
Frequency of ponding: Frequent, very long duration, 0.5 foot to 5 feet deep, December through June
Surface runoff: Negligible to high
Soil reaction: Moderately acid to neutral in the surface layer; slightly acid to slightly alkaline in the subsoil; neutral to moderately alkaline in the substratum
Parent material: Clayey alluvium

Land Use

Major uses: Most areas are in woodland; a few areas are cultivated

Cropland

Land capability: 7w
Suitability: Not suited
Adapted crops: None
Management concerns:
- Frequent flooding
- Frequent ponding
- Seasonal wetness

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Pasture and Hayland

Suitability: Not suited
Adapted plants: None
Management concerns:
- Frequent flooding
- Frequent ponding
- Seasonal wetness

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Other Uses

Forest Management
Recreation
Wildlife Habitat
Urban Uses

Water Management
Waste Management
• See Use and Management of the Soils, Forest Productivity and Management, Recreation, Wildlife Habitat, and Engineering sections

13A—Lagrue silty clay loam, 0 to 1 percent slopes

Setting

Landscape: Grand Prairie upland
Landform: Depression

Typical Profile

Surface layer:
0 to 4 inches—dark grayish brown silty clay loam with strong brown iron concentrations

Subsoil:
4 to 11 inches—gray silty clay loam with strong brown iron concentrations
11 to 30 inches—gray silty clay with strong brown and yellowish red iron concentrations
30 to 63 inches—light brownish gray silty clay with strong brown and yellowish red iron concentrations and gray iron depletions
63 to 80 inches—grayish brown silty clay with strong brown and brown iron concentrations and gray iron depletions

Minor Components

• Dewitt soils
• Miscellaneous wet areas

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Very slow
Available water capacity: High
Depth to seasonal high water table: Saturated 0 to 1 foot from December through April and moist in all underlying layers
Shrink-swell potential: High
Hazard of flooding: None
Surface runoff: Negligible to high
Soil reaction: Strongly acid to neutral in the surface layer; extremely acid to moderately acid in the subsoil
Parent material: Clayey alluvium

Land Use

Major uses: Most areas are cultivated; a few areas are in woodland

Cropland

Land capability: 3w
Suitability: Moderately suited
Adapted crops: Soybeans, grain sorghum, and rice
Management concerns:
• Seasonal wetness
Management measures:
• See Use and Management of the Soils, Crops and Pasture section

Pasture and Hayland

Suitability: Moderately suited
Adapted plants: Tall fescue and bermudagrass
Management concerns:
• Seasonal wetness
Management measures:
• See Use and Management of the Soils, Crops and Pasture section

Other Uses

Forest Management
Recreation
Wildlife Habitat
Urban Uses
Water Management
Waste Management
• See Use and Management of the Soils, Forest Productivity and Management, Recreation, Wildlife Habitat, and Engineering sections

14B—Muskogee silt loam, 1 to 3 percent slopes

Setting

Landscape: Grand Prairie upland
Landform: Terrace

Typical Profile

Surface layer:
0 to 5 inches—dark grayish brown silt loam

Subsoil:
5 to 10 inches—yellowish brown silty clay loam with yellowish red iron concentrations
10 to 16 inches—yellowish brown silty clay with yellowish red, red, and strong brown iron concentrations and light gray iron depletions
16 to 29 inches—yellowish brown silty clay with yellowish red iron concentrations and light gray iron depletions
29 to 41 inches—variegated yellowish brown, light gray, and red silty clay

41 to 53 inches—yellowish red silty clay with strong brown iron concentrations and light yellowish brown and light gray iron depletions
53 to 60 inches—red silty clay with strong brown iron concentrations
60 to 72 inches—red clay
72 to 90 inches—red clay with white clay depletions

Minor Components

- Dewitt soils
- Immanuel soils
- Stuttgart soils
- Tichnor soils
- Miscellaneous wet areas

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Slow
Available water capacity: High
Depth to seasonal high water table: Saturated 1 foot to 2 feet from December through April and saturated in all underlying layers
Shrink-swell potential: High
Hazard of flooding: None
Surface runoff: High
Soil reaction: Strongly acid to slightly acid in the surface layer (and subsurface layer when present) and upper part of the subsoil; moderately acid to moderately alkaline in the lower part of the subsoil
Parent material: Silty over clayey alluvium

Land Use

Major uses: Most areas are cultivated; a few areas are in woodland

Cropland

Land capability: 2e
Suitability: Moderately suited
Adapted crops: Winter small grains, soybeans, rice, corn, and grain sorghum
Management concerns:
- Seasonal wetness
- Moderate erosion hazard

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Pasture and Hayland

Suitability: Well suited
Adapted plants: Common bermudagrass and bahiagrass
Management concerns:
- Seasonal wetness
- Moderate erosion hazard

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Other Uses

Forest Management
Recreation
Wildlife Habitat
Urban Uses
Water Management
Waste Management
- See Use and Management of the Soils, Forest Productivity and Management, Recreation, Wildlife Habitat, and Engineering sections

14C—Muskogee silt loam, 3 to 8 percent slopes

Setting

Landscape: Grand Prairie upland
Landform: Terrace

Typical Profile

Surface layer:
0 to 5 inches—dark grayish brown silt loam

Subsoil:
5 to 10 inches—yellowish brown silty clay loam with yellowish red iron concentrations
10 to 16 inches—yellowish brown silty clay with yellowish red, red, and strong brown iron concentrations and light gray iron depletions
16 to 29 inches—yellowish brown silty clay with yellowish red iron concentrations and light gray iron depletions
29 to 41 inches—variegated yellowish brown, light gray, and red silty clay
41 to 53 inches—yellowish red silty clay with strong brown iron concentrations and light yellowish brown and light gray iron depletions
53 to 60 inches—red silty clay with strong brown iron concentrations
60 to 72 inches—red clay
72 to 90 inches—red clay with white clay depletions

Minor Components

- Immanuel soils
- Stuttgart soils
- Tichnor soils
- Miscellaneous wet areas

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Slow
Available water capacity: High
Depth to seasonal high water table: Saturated 1 foot to 2 feet from December through April and saturated in all underlying layers
Shrink-swell potential: High
Hazard of flooding: None
Surface runoff: High to very high
Soil reaction: Strongly acid to slightly acid in the surface layer (and subsurface layer when present) and upper part of the subsoil; moderately acid to moderately alkaline in the lower part of the subsoil
Parent material: Silty over clayey alluvium

Land Use

Major uses: Most areas are cultivated; a few areas are in woodland

Cropland

Land capability: 3e
Suitability: Poorly suited
Adapted crops: Winter small grains, soybeans, corn, and grain sorghum
Management concerns:
• Seasonal wetness
• Severe erosion hazard
Management measures:
• See Use and Management of the Soils, Crops and Pasture section

Pasture and Hayland

Suitability: Well suited
Adapted plants: Common bermudagrass and bahiagrass
Management concerns:
• Severe erosion hazard
Management measures:
• See Use and Management of the Soils, Crops and Pasture section

Other Uses

Forest Management
Recreation
Wildlife Habitat
Urban Uses
Water Management
Waste Management
• See Use and Management of the Soils, Forest Productivity and Management, Recreation, Wildlife Habitat, and Engineering sections

14D—Muskogee silt loam, 8 to 15 percent slopes

Setting

Landscape: Grand Prairie upland
Landform: Terrace

Typical Profile

Surface layer:
0 to 5 inches—dark grayish brown silt loam

Subsoil:
5 to 10 inches—yellowish brown silty clay with yellowish red, red, and strong brown iron concentrations and light gray iron depletions
10 to 16 inches—yellowish brown silty clay with yellowish red, red, and strong brown iron concentrations and light gray iron depletions
16 to 29 inches—yellowish brown silty clay with yellowish red iron concentrations and light gray iron depletions
29 to 41 inches—variegated yellowish brown, light gray, and red silty clay
41 to 53 inches—yellowish red silty clay with strong brown iron concentrations and light yellowish brown and light gray iron depletions
53 to 60 inches—red silty clay with strong brown iron concentrations
60 to 72 inches—red clay
72 to 90 inches—red clay with white clay depletions

Minor Components

• Immanuel soils
• Stuttgart soils
• Tichnor soils

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Slow
Available water capacity: High
Depth to seasonal high water table: Saturated 1 foot to 2 feet from December through April and saturated in all underlying layers
Shrink-swell potential: High
Hazard of flooding: None
Surface runoff: Very high
Soil reaction: Strongly acid to slightly acid in the surface layer (and subsurface layer when present) and upper part of the subsoil; moderately acid to moderately alkaline in the lower part of the subsoil
Parent material: Silty over clayey alluvium

Land Use

Major uses: Most areas are cultivated; a few areas are in woodland

Cropland

Land capability: 4e
Suitability: Not suited
Adapted crops: None
Management concerns:
- Seasonal wetness
- Very severe erosion hazard

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Pasture and Hayland

Suitability: Moderately suited
Adapted plants: Common bermudagrass and bahiagrass
Management concerns:
- Very severe erosion hazard

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Other Uses

Forest Management
Recreation
Wildlife Habitat
Urban Uses
Water Management
Waste Management
- See Use and Management of the Soils, Forest Productivity and Management, Recreation, Wildlife Habitat, and Engineering sections

15A—Oaklimeter silt loam, 0 to 1 percent slopes, occasionally flooded

Setting

Landscape: Grand Prairie upland
Landform: Flood plain

Typical Profile

Surface layer:
0 to 8 inches—brown silt loam

Subsoil:
8 to 21 inches—brown silt loam with brown, yellowish brown, and strong brown iron concentrations
21 to 40 inches—yellowish brown silt loam with brown and yellowish brown iron concentrations and grayish brown iron depletions
40 to 55 inches—yellowish brown silt loam with yellowish brown and brown iron concentrations and light gray and brownish gray iron depletions
55 to 72 inches—grayish brown silt loam with yellowish brown and brown iron concentrations and light gray iron depletions

Minor Components

- Tichnor soils
- Miscellaneous wet areas

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate
Available water capacity: High
Depth to seasonal high water table: Saturated 1.5 to 2.5 feet from December through April and saturated in all underlying layers
Shrink-swell potential: Low
Hazard of flooding: Occasional, very brief duration, December through April
Surface runoff: Negligible
Soil reaction: Very strongly acid to moderately acid in the surface layer; very strongly acid or strongly acid in the subsoil
Parent material: Silty alluvium

Land Use

Major uses: Most areas are cultivated; a few areas are in woodland

Cropland

Land capability: 2w
Suitability: Well suited
Adapted crops: Soybeans, cotton, and grain sorghum
Management concerns:
- Occasional flooding
- Seasonal wetness

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Pasture and Hayland

Suitability: Moderately suited
Adapted plants: Tall fescue and bermudagrass
Management concerns:
- Occasional flooding
- Seasonal wetness

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Other Uses

Forest Management
Recreation
Wildlife Habitat
Urban Uses
Water Management
Waste Management
• See Use and Management of the Soils, Forest Productivity and Management, Recreation, Wildlife Habitat, and Engineering sections

16A—Overcup silt loam, 0 to 1 percent slopes

Setting

Landscape: White River valley
Landform: Stream terrace

Typical Profile

Surface layer:
0 to 8 inches—dark grayish brown silt loam

Subsurface layer:
8 to 14 inches—light gray silt loam with yellowish brown iron concentrations

Subsoil:
14 to 40 inches—grayish brown clay with yellowish brown iron concentrations
40 to 60 inches—grayish brown silty clay with yellowish brown iron concentrations
60 to 72 inches—light brownish gray silty clay loam with yellowish brown iron concentrations

Minor Components

- Forestdale soils
- Miscellaneous wet areas

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Very slow
Available water capacity: High
Depth to seasonal high water table: Saturated 0 to 1 foot from December through April and saturated in all underlying layers
Shrink-swell potential: High
Hazard of flooding: None
Surface runoff: Negligible to high
Soil reaction: Strongly acid or moderately acid in the surface layer; very strongly acid to moderately acid in the subsurface layer; very strongly acid to slightly acid in the upper part of the subsoil; moderately acid to moderately alkaline in the lower part of the subsoil
Parent material: Clayey alluvium

Land Use

Major uses: Most areas are cultivated; a few areas are in woodland

Cropland

Land capability: 3w
Suitability: Moderately suited
Adapted crops: Rice, soybeans, and grain sorghum
Management concerns:
• Seasonal wetness
Management measures:
• See Use and Management of the Soils, Crops and Pasture section

Pasture and Hayland

Suitability: Moderately suited
Adapted plants: Bermudagrass and tall fescue
Management concerns:
• Seasonal wetness
Management measures:
• See Use and Management of the Soils, Crops and Pasture section

Other Uses

Forest Management
Recreation
Wildlife Habitat
Urban Uses
Water Management
Waste Management
• See Use and Management of the Soils, Forest Productivity and Management, Recreation, Wildlife Habitat, and Engineering sections

17A—Perry clay, 0 to 1 percent slopes

Setting

Landscape: Arkansas River valley
Landform: Backswamp

Typical Profile

Surface layer:
0 to 4 inches—dark grayish brown clay

Subsoil:
4 to 27 inches—gray clay with strong brown iron concentrations

27 to 36 inches—gray clay with strong brown and yellowish red iron concentrations
36 to 60 inches—reddish brown clay

Substratum:
60 to 80 inches—reddish brown clay

Minor Components

- Hebert soils
- Perry soils
- Portland soils
- Miscellaneous wet areas

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Very slow
Available water capacity: High
Depth to seasonal high water table: Saturated 0 to 2 feet from December through April and moist in all underlying layers
Shrink-swell potential: Very high
Hazard of flooding: None
Surface runoff: Negligible to high
Soil reaction: Strongly acid to slightly acid in the surface layer; very strongly acid to slightly acid in the upper part of the subsoil; and neutral to moderately alkaline in the lower part of the subsoil and substratum
Parent material: Clayey alluvium

Land Use

Major uses: Most areas are cultivated; a few areas are in woodland

Cropland

Land capability: 3w
Suitability: Moderately suited
Adapted crops: Rice, soybeans, and grain sorghum
Management concerns:
- Seasonal wetness

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Pasture and Hayland

Suitability: Moderately suited
Adapted plants: Bermudagrass and tall fescue
Management concerns:
- Seasonal wetness

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Other Uses

Forest Management
Recreation
Wildlife Habitat
Urban Uses
Water Management
Waste Management
- See Use and Management of the Soils, Forest Productivity and Management, Recreation, Wildlife Habitat, and Engineering sections

18A—Perry clay, 0 to 1 percent slopes, frequently flooded

Setting

Landscape: Arkansas River valley
Landform: Backswamp

Typical Profile

Surface layer:
0 to 4 inches—dark grayish brown clay

Subsoil:
4 to 27 inches—gray clay with strong brown iron concentrations
27 to 36 inches—gray clay with strong brown and yellowish red iron concentrations
36 to 60 inches—reddish brown clay

Substratum:
60 to 80 inches—reddish brown clay

Minor Components

- Hebert soils
- Perry soils
- Portland soils
- Miscellaneous wet areas

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Very slow
Available water capacity: High
Depth to seasonal high water table: Saturated 0 to 2 feet from December through April and moist in all underlying layers
Shrink-swell potential: Very high
Hazard of flooding: Frequent, long duration, December through April
Surface runoff: Negligible to high
Soil reaction: Strongly acid to slightly acid in the surface layer; very strongly acid to slightly acid in the upper part of the subsoil; neutral to

moderately alkaline in the lower part of the subsoil and substratum
Parent material: Clayey alluvium

Land Use

Major uses: Most areas are cultivated; a few areas are in woodland

Cropland

Land capability: 4w
Suitability: Poorly suited
Adapted crops: Soybeans
Management concerns:
- Frequent flooding
- Seasonal wetness

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Pasture and Hayland

Suitability: Poorly suited
Adapted plants: Bermudagrass and tall fescue
Management concerns:
- Frequent flooding
- Seasonal wetness

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Other Uses

Forest Management
Recreation
Wildlife Habitat
Urban Uses
Water Management
Waste Management
- See Use and Management of the Soils, Forest Productivity and Management, Recreation, Wildlife Habitat, and Engineering sections

19A—Portland clay, 0 to 1 percent slopes

Setting

Landscape: Arkansas River valley
Landform: Backswamp

Typical Profile

Surface layer:
0 to 4 inches—dark brown clay

Subsoil:
4 to 17 inches—brown clay with light brownish gray iron depletions
17 to 23 inches—brown clay with light brownish gray iron depletions
23 to 30 inches—reddish brown clay with light brownish gray iron depletions
30 to 50 inches—reddish brown clay

Substratum:
50 to 80 inches—reddish brown silty clay

Minor Components

- Hebert soils
- Perry soils
- Portland soils
- Miscellaneous wet areas

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Very slow
Available water capacity: High
Depth to seasonal high water table: Saturated 1 foot to 2 feet from December through April and moist in all underlying layers
Shrink-swell potential: High
Hazard of flooding: None
Surface runoff: Negligible to high
Soil reaction: Very strongly acid to slightly acid in the surface layer and upper part of the subsoil; slightly acid to moderately alkaline in the lower part of the subsoil and substratum
Parent material: Clayey alluvium

Land Use

Major uses: Most areas are cultivated; a few areas are in woodland

Cropland

Land capability: 3w
Suitability: Moderately suited
Adapted crops: Rice, soybeans, and grain sorghum
Management concerns:
- Seasonal wetness

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Pasture and Hayland

Suitability: Moderately suited
Adapted plants: Bermudagrass and tall fescue
Management concerns:
- Seasonal wetness

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Other Uses

Forest Management
Recreation
Wildlife Habitat
Urban Uses
Water Management
Waste Management
• See Use and Management of the Soils, Forest Productivity and Management, Recreation, Wildlife Habitat, and Engineering sections

20A—Portland clay, 0 to 1 percent slopes, frequently flooded

Setting

Landscape: Arkansas River valley
Landform: Backswamp

Typical Profile

Surface layer:
0 to 4 inches—dark brown clay

Subsoil:
4 to 17 inches—brown clay with light brownish gray iron depletions
17 to 23 inches—brown clay with light brownish gray iron depletions
23 to 30 inches—reddish brown clay with light brownish gray iron depletions
30 to 50 inches—reddish brown clay

Substratum:
50 to 80 inches—reddish brown silty clay

Minor Components

- Hebert soils
- Perry soils
- Portland soils
- Miscellaneous wet areas

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Very slow
Available water capacity: High
Depth to seasonal high water table: Saturated 1 foot to 2 feet from December through April and moist in all underlying layers
Shrink-swell potential: High
Hazard of flooding: Frequent, brief duration, December through April
Surface runoff: Negligible to high
Soil reaction: Very strongly acid to slightly acid in the surface layer and upper part of the subsoil; slightly acid to moderately alkaline in the lower part of the subsoil and substratum
Parent material: Clayey alluvium

Land Use

Major uses: Most areas are cultivated; a few areas are in woodland

Cropland

Land capability: 4w
Suitability: Poorly suited
Adapted crops: Rice, soybeans, and grain sorghum
Management concerns:
- Frequent flooding
- Seasonal wetness

Management measures:
• See Use and Management of the Soils, Crops and Pasture section

Pasture and Hayland

Suitability: Moderately suited
Adapted plants: Bermudagrass and tall fescue
Management concerns:
- Frequent flooding
- Seasonal wetness

Management measures:
• See Use and Management of the Soils, Crops and Pasture section

Other Uses

Forest Management
Recreation
Wildlife Habitat
Urban Uses
Water Management
Waste Management
• See Use and Management of the Soils, Forest Productivity and Management, Recreation, Wildlife Habitat, and Engineering sections

21A—Rilla silt loam, 0 to 1 percent slopes

Setting

Landscape: Arkansas River valley
Landform: Natural levee

Typical Profile

Surface layer:
0 to 5 inches—brown silt loam

Subsoil:
5 to 11 inches—yellowish red silty clay loam with pale brown clay depletions
11 to 25 inches—reddish brown silty clay loam with pale brown clay depletions
25 to 35 inches—reddish brown silty clay loam
35 to 55 inches—reddish brown loam with pale brown clay depletions

Substratum:
55 to 72 inches—light reddish brown loam with light brownish gray clay depletions

Minor Components

- Hebert soils
- Miscellaneous wet areas

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Very high
Depth to seasonal high water table: More than 6 feet throughout the year
Shrink-swell potential: Moderate
Hazard of flooding: None
Surface runoff: Negligible
Soil reaction: Strongly acid to slightly acid in the surface layer; very strongly acid or strongly acid in the upper part of the subsoil; strongly acid or moderately acid in the lower part of the subsoil; very strongly acid to neutral in the substratum
Parent material: Loamy alluvium

Land Use

Major uses: Most areas are cultivated; a few areas are in woodland

Cropland

Land capability: 1
Suitability: Well suited
Adapted crops: Soybeans, corn, cotton, grain sorghum, and winter small grains
Management concerns:
- None

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Pasture and Hayland

Suitability: Well suited
Adapted plants: Bermudagrass and tall fescue
Management concerns:
- None

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Other Uses

Forest Management
Recreation
Wildlife Habitat
Urban Uses
Water Management
Waste Management
- See Use and Management of the Soils, Forest Productivity and Management, Recreation, Wildlife Habitat, and Engineering sections

21B—Rilla silt loam, 1 to 3 percent slopes

Setting

Landscape: Arkansas River valley
Landform: Natural levee

Typical Profile

Surface layer:
0 to 5 inches—brown silt loam

Subsoil:
5 to 11 inches—yellowish red silty clay loam with pale brown clay depletions
11 to 25 inches—reddish brown silty clay loam with pale brown clay depletions
25 to 35 inches—reddish brown silty clay loam
35 to 55 inches—reddish brown loam with pale brown clay depletions

Substratum:
55 to 72 inches—light reddish brown loam with light brownish gray clay depletions

Minor Components

- Hebert soils
- Miscellaneous wet areas

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Very high
Depth to seasonal high water table: More than 6 feet throughout the year
Shrink-swell potential: Moderate
Hazard of flooding: None
Surface runoff: Low

Soil reaction: Strongly acid to slightly acid in the surface layer; very strongly acid or strongly acid in the upper part of the subsoil; strongly acid or moderately acid in the lower part of the subsoil; very strongly acid to neutral in the substratum
Parent material: Loamy alluvium

Land Use

Major uses: Most areas are cultivated; a few areas are in woodland

Cropland

Land capability: 2e
Suitability: Well suited
Adapted crops: Soybeans, corn, cotton, grain sorghum, and winter small grains
Management concerns:
• Moderate erosion hazard
Management measures:
• See Use and Management of the Soils, Crops and Pasture section

Pasture and Hayland

Suitability: Well suited
Adapted plants: Bermudagrass and tall fescue
Management concerns:
• Moderate erosion hazard
Management measures:
• See Use and Management of the Soils, Crops and Pasture section

Other Uses

Forest Management
Recreation
Wildlife Habitat
Urban Uses
Water Management
Waste Management
• See Use and Management of the Soils, Forest Productivity and Management, Recreation, Wildlife Habitat, and Engineering sections

22—Riverwash, sandy, frequently flooded

Setting

Landscape: Arkansas River valley and White River valley
Landform: Channel

Riverwash is a miscellaneous area that consists of unstable sandy sediments that are frequently flooded, washed, and reworked by rivers. These areas are subject to constant deposition and erosion.

Minor Components

- Crevasse soils
- Miscellaneous wet areas

23A—Stuttgart silt loam, 0 to 1 percent slopes

Setting

Landscape: Grand Prairie upland
Landform: Stream terrace

Typical Profile

Surface layer:
0 to 4 inches—brown silt loam with dark brown and strong brown iron concentrations

Subsurface layer:
4 to 9 inches—dark brown silt loam with brown and dark yellowish brown iron concentrations
9 to 15 inches—yellowish brown silt loam with red and yellowish red iron concentrations, pale brown iron depletions, and light gray clay depletions

Subsoil:
15 to 21 inches—variegated reddish brown and grayish brown silty clay with light gray clay depletions
21 to 27 inches—dark brown silty clay loam with grayish brown and yellowish brown iron depletions and gray clay depletions
27 to 50 inches—light brownish gray silt loam with strong brown and yellowish brown iron concentrations, grayish brown iron depletions, and light gray clay depletions
50 to 80 inches—light brownish gray silt loam with light yellowish brown and strong brown iron concentrations

Minor Components

- Dewitt soils
- Immanuel soils
- Lagrue soils
- Tichnor soils

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Slow
Available water capacity: Very high
Depth to seasonal high water table: Saturated 1 foot to 2 feet from December through April and saturated in all underlying layers
Shrink-swell potential: Severe

Hazard of flooding: None
Surface runoff: Negligible to medium
Soil reaction: Strongly acid or moderately acid in the surface and subsurface layers; very strongly acid to moderately acid in the upper part of the subsoil; moderately acid to slightly acid in the lower part of the subsoil
Parent material: Silty and clayey alluvium

Land Use

Major uses: Most areas are cultivated; a few areas are in woodland

Cropland

Land capability: 2w
Suitability: Well suited
Adapted crops: Rice, soybeans, grain sorghum, and wheat
Management concerns:
- Seasonal wetness
- High sodium content near surface

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Pasture and Hayland

Suitability: Moderately suited
Adapted plants: Bahiagrass, bermudagrass, and tall fescue
Management concerns:
- Seasonal wetness
- High sodium content near surface

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Other Uses

Forest Management
Recreation
Wildlife Habitat
Urban Uses
Water Management
Waste Management
- See Use and Management of the Soils, Forest Productivity and Management, Recreation, Wildlife Habitat, and Engineering sections

23B—Stuttgart silt loam, 1 to 3 percent slopes

Setting

Landscape: Grand Prairie upland
Landform: Stream terrace

Typical Profile

Surface layer:
0 to 4 inches—brown silt loam with dark brown and strong brown iron concentrations

Subsurface layer:
4 to 9 inches—dark brown silt loam with brown and dark yellowish brown iron concentrations
9 to 15 inches—yellowish brown silt loam with red and yellowish red iron concentrations, pale brown iron depletions, and light gray clay depletions

Subsoil:
15 to 21 inches—variegated reddish brown and grayish brown silty clay with light gray clay depletions
21 to 27 inches—dark brown silty clay loam with grayish brown and yellowish brown iron depletions and gray clay depletions
27 to 50 inches—light brownish gray silt loam with strong brown and yellowish brown iron concentrations, grayish brown iron depletions, and light gray clay depletions
50 to 80 inches—light brownish gray silt loam with light yellowish brown and strong brown iron concentrations

Minor Components

- Immanuel soils
- Tichnor soils
- Miscellaneous wet areas

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Slow
Available water capacity: Very high
Depth to seasonal high water table: Saturated 1 foot to 2 feet from December through April and saturated in all underlying layers
Shrink-swell potential: Severe
Hazard of flooding: None
Surface runoff: High
Soil reaction: Strongly acid or moderately acid in the surface and subsurface layers; very strongly acid to moderately acid in the upper part of the subsoil; moderately acid to slightly acid in the lower part of the subsoil
Parent material: Silty and clayey alluvium

Land Use

Major uses: Most areas are cultivated; a few areas are in woodland

Cropland

Land capability: 2e
Suitability: Moderately suited
Adapted crops: Rice, soybeans, grain sorghum, and wheat
Management concerns:
• Seasonal wetness
• High sodium content near surface
• Moderate erosion hazard
Management measures:
• See Use and Management of the Soils, Crops and Pasture section

Pasture and Hayland

Suitability: Well suited
Adapted plants: Bermudagrass and tall fescue
Management concerns:
• Seasonal wetness
• High sodium content near surface
• Moderate erosion hazard
Management measures:
• See Use and Management of the Soils, Crops and Pasture section

Other Uses

Forest Management
Recreation
Wildlife Habitat
Urban Uses
Water Management
Waste Management
• See Use and Management of the Soils, Forest Productivity and Management, Recreation, Wildlife Habitat, and Engineering sections

24A—Tichnor silt loam, 0 to 1 percent slopes, frequently flooded

Setting

Landscape: Grand Prairie upland
Landform: Flood plain

Typical Profile

Surface layer:
0 to 7 inches—dark brown silt loam with strong brown iron concentrations

Subsurface layer:
7 to 19 inches—light brownish gray silt loam with strong brown, yellowish brown, and yellowish red iron concentrations
19 to 31 inches—light gray silt loam with pale brown and brownish yellow iron concentrations

Subsoil:
31 to 47 inches—light brownish gray silty clay loam with strong brown and brownish yellow iron concentrations and light brownish gray iron depletions
47 to 65 inches—light brownish gray silty clay loam with yellowish brown, brownish yellow, and strong brown iron concentrations
65 to 80 inches—light brownish gray silt loam with yellowish brown and dark yellowish brown iron concentrations

Minor Components

• Oaklimeter soils
• Tichnor soils
• Miscellaneous wet areas

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Moderately slow
Available water capacity: High
Depth to seasonal high water table: Saturated 0 to 1 foot from December through April and saturated in all underlying layers
Shrink-swell potential: Moderate
Hazard of flooding: Frequent, long duration, December through April
Surface runoff: Negligible
Soil reaction: Extremely acid to moderately acid throughout
Parent material: Loamy alluvium

Land Use

Major uses: Most areas are cultivated; a few areas are in woodland

Cropland

Land capability: 4w
Suitability: Poorly suited
Adapted crops: Soybeans
Management concerns:
• Frequent flooding
• Seasonal wetness
Management measures:
• See Use and Management of the Soils, Crops and Pasture section

Pasture and Hayland

Suitability: Moderately suited
Adapted plants: Bermudagrass and tall fescue
Management concerns:
• Frequent flooding
• Seasonal wetness

Management measures:
• See Use and Management of the Soils, Crops and Pasture section

Other Uses

Forest Management
Recreation
Wildlife Habitat
Urban Uses
Water Management
Waste Management
• See Use and Management of the Soils, Forest Productivity and Management, Recreation, Wildlife Habitat, and Engineering sections

25A—Tichnor silt loam, ponded, 0 to 1 percent slopes, frequently flooded

Setting

Landscape: Grand Prairie upland
Landform: Flood plain

Typical Profile

Surface layer:
0 to 7 inches—dark brown silt loam with strong brown iron concentrations

Subsurface layer:
7 to 19 inches—light brownish gray silt loam with strong brown, yellowish brown, and yellowish red iron concentrations
19 to 31 inches—light gray silt loam with pale brown and brownish yellow iron concentrations

Subsoil:
31 to 47 inches—light brownish gray silty clay loam with strong brown and brownish yellow iron concentrations and light brownish gray iron depletions
47 to 65 inches—light brownish gray silty clay loam with yellowish brown, brownish yellow, and strong brown iron concentrations
65 to 80 inches—light brownish gray silt loam with yellowish brown and dark yellowish brown iron concentrations

Minor Components

• Tichnor soils
• Miscellaneous wet areas

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Very poorly drained
Permeability: Moderately slow
Available water capacity: High
Depth to seasonal high water table: Saturated 0 to 1 foot from September through June and saturated in all underlying layers
Shrink-swell potential: Moderate
Hazard of flooding: Frequent, very long duration, December through April
Frequency of ponding: Frequent, very long duration, 0.5 foot to 5 feet deep, December through June
Surface runoff: Negligible
Soil reaction: Extremely acid to moderately acid throughout
Parent material: Loamy alluvium

Land Use

Major uses: Most areas are in woodland; a few areas are cultivated

Cropland

Land capability: 7w
Suitability: Not suited
Adapted crops: None
Management concerns:
• Frequent flooding
• Frequent ponding
• Seasonal wetness
Management measures:
• See Use and Management of the Soils, Crops and Pasture section

Pasture and Hayland

Suitability: Not suited
Adapted plants: None
Management concerns:
• Frequent flooding
• Frequent ponding
• Seasonal wetness
Management measures:
• See Use and Management of the Soils, Crops and Pasture section

Other Uses

Forest Management
Recreation
Wildlife Habitat
Urban Uses
Water Management
Waste Management
• See Use and Management of the Soils, Forest Productivity and Management, Recreation, Wildlife Habitat, and Engineering sections

26C—Udipsamments, 0 to 8 percent slopes

Setting

Landscape: Arkansas River valley and White River valley
Landform: Flood plain

Typical Profile

Surface layer:
0 to 5 inches—light yellowish brown loamy fine sand

Substratum:
5 to 80 inches—stratified light brownish gray, pale brown, and brown loamy fine sand, fine sand, and sand

Minor Components

- Miscellaneous wet areas

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Excessively drained
Permeability: Very rapid
Available water capacity: Very low
Depth to seasonal high water table: More than 6 feet throughout the year
Shrink-swell potential: Low
Hazard of flooding: None
Surface runoff: Negligible to very low
Soil reaction: Slightly acid to moderately alkaline throughout
Parent material: Sandy sediments dredged from the navigation channels along the White and Arkansas Rivers and deposited on the river banks

Land Use

Major uses: Most areas have sparse vegetation

Cropland

Land capability: 7s
Suitability: Not suited
Adapted crops: None
Management concerns:
- Droughtiness
- Soil blowing

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Pasture and Hayland

Suitability: Not suited
Adapted plants: None
Management concerns:
- Droughtiness
- Soil blowing

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Other Uses

Forest Management
Recreation
Wildlife Habitat
Urban Uses
Water Management
Waste Management
- See Use and Management of the Soils, Forest Productivity and Management, Recreation, Wildlife Habitat, and Engineering sections

27—Water

Setting

Landscape: Arkansas River Valley, White River valley, and Grand Prairie upland
Landform: Rivers, streams, ponds, and oxbow lakes

28B—Yancopin silty clay loam, 1 to 3 percent slopes, frequently flooded

Setting

Landscape: White River valley
Landform: Flood plain

Typical Profile

Surface layer:
0 to 3 inches—grayish brown silty clay loam

Subsoil:
3 to 12 inches—grayish brown silty clay loam with yellowish brown iron concentrations
12 to 26 inches—grayish brown silty clay loam with brown and strong brown iron concentrations
26 to 36 inches—dark grayish brown silty clay loam with strong brown iron concentrations
36 to 55 inches—dark grayish brown silt loam with yellowish brown iron concentrations

Substratum:
55 to 72 inches—grayish brown sandy loam with dark yellowish brown iron concentrations

Minor Components

- Kobel soils
- Miscellaneous wet areas

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Available water capacity: High
Depth to seasonal high water table: Saturated 1.5 to 4 feet from December through April and moist in all underlying layers
Shrink-swell potential: Moderate
Hazard of flooding: Frequent, brief duration, December through April
Surface runoff: Medium
Soil reaction: Moderately acid to neutral in the surface layer; slightly acid to neutral in the subsoil; slightly acid to slightly alkaline in the substratum
Parent material: Silty alluvium

Land Use

Major uses: Most areas are in woodland; a few areas are cultivated

Cropland

Land capability: 4w
Suitability: Poorly suited
Adapted crops: Rice, soybeans, and grain sorghum
Management concerns:
- Frequent flooding
- Seasonal wetness

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Pasture and Hayland

Suitability: Moderately suited
Adapted plants: Bermudagrass and tall fescue
Management concerns:
- Frequent flooding
- Seasonal wetness

Management measures:
- See Use and Management of the Soils, Crops and Pasture section

Other Uses

Forest Management
Recreation
Wildlife Habitat
Urban Uses
Water Management
Waste Management
- See Use and Management of the Soils, Forest Productivity and Management, Recreation, Wildlife Habitat, and Engineering sections

29A—Yorktown silty clay, ponded, 0 to 1 percent slopes, frequently flooded

Setting

Landscape: Arkansas River valley
Landform: Oxbow

Typical Profile

Surface layer:
0 to 7 inches—gray silty clay with gray iron depletions

Subsoil:
7 to 22 inches—gray clay with strong brown and yellowish brown iron concentrations
22 to 42 inches—gray clay with strong brown iron concentrations
42 to 60 inches—greenish gray clay with yellowish red iron concentrations
60 to 72 inches—reddish brown clay with gray iron depletions

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Very poorly drained
Permeability: Very slow
Available water capacity: Moderate
Depth to seasonal high water table: Saturated 0 to 1 foot from December through April and moist in all underlying layers
Shrink-swell potential: Very high
Hazard of flooding: Frequent, very long duration, December through April
Frequency of ponding: Frequent, very long duration, 0.5 foot to 5 feet deep, December through June
Surface runoff: Negligible to high
Soil reaction: Moderately acid to neutral in the surface layer and upper part of the subsoil; slightly alkaline or moderately alkaline in the lower part of the subsoil
Parent material: Clayey alluvium

Land Use

Major uses: Most areas are in woodland

Cropland

Land capability: 7w
Suitability: Not suited
Adapted crops: None
Management concerns:
- Frequent flooding
- Frequent ponding
- Seasonal wetness

Management measures:
• See Use and Management of the Soils, Crops and Pasture section

Pasture and Hayland

Suitability: Not suited
Adapted plants: None
Management concerns:
• Frequent flooding
• Frequent ponding
• Seasonal wetness
Management measures:
• See Use and Management of the Soils, Crops and Pasture section

Other Uses

Forest Management
Recreation
Wildlife Habitat
Urban Uses
Water Management
Waste Management
• See Use and Management of the Soils, Forest Productivity and Management, Recreation, Wildlife Habitat, and Engineering sections

Table 4.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
1C	Crevasse loamy fine sand, 0 to 5 percent slopes, occasionally flooded	4,158	0.6
2B	Desha silty clay, 0 to 3 percent slopes, occasionally flooded	3,719	0.6
3A	Dewitt silt loam, 0 to 1 percent slopes	127,286	19.2
4B	Dubbs silt loam, 0 to 3 percent slopes	620	*
5B	Dundee silt loam, 0 to 2 percent slopes, occasionally flooded	5,708	0.9
6A	Ethel silt loam, 0 to 1 percent slopes	20,742	3.1
7A	Forestdale silty clay loam, 0 to 1 percent slopes, frequently flooded	3,363	0.5
8A	Hebert silt loam, 0 to 1 percent slopes	12,741	1.9
9A	Immanuel silt loam, 0 to 1 percent slopes	6,399	1.0
9B	Immanuel silt loam, 1 to 3 percent slopes	32,138	4.9
9C	Immanuel silt loam, 3 to 8 percent slopes	20,926	3.2
9D	Immanuel silt loam, 8 to 15 percent slopes	8,412	1.3
9E	Immanuel silt loam, 15 to 25 percent slopes	1,166	0.2
10A	Keo loam, 0 to 1 percent slopes, occasionally flooded	296	*
10C	Keo loam, 1 to 6 percent slopes, occasionally flooded	12,486	1.9
11A	Kobel silty clay, 0 to 1 percent slopes, frequently flooded	34,512	5.2
12A	Kobel silty clay, ponded, 0 to 1 percent slopes, frequently flooded	7,246	1.1
13A	Lagrue silty clay loam, 0 to 1 percent slopes	8,972	1.4
14B	Muskogee silt loam, 1 to 3 percent slopes	4,118	0.6
14C	Muskogee silt loam, 3 to 8 percent slopes	8,236	1.2
14D	Muskogee silt loam, 8 to 15 percent slopes	2,366	0.4
15A	Oaklimeter silt loam, 0 to 1 percent slopes, occasionally flooded	2,325	0.4
16A	Overcup silt loam, 0 to 1 percent slopes	6,733	1.0
17A	Perry clay, 0 to 1 percent slopes	15,183	2.3
18A	Perry clay, 0 to 1 percent slopes, frequently flooded	37,259	5.6
19A	Portland clay, 0 to 1 percent slopes	8,806	1.3
20A	Portland clay, 0 to 1 percent slopes, frequently flooded	9,980	1.5
21A	Rilla silt loam, 0 t 1 percent slopes	4,683	0.7
21B	Rilla silt loam, 1 to 3 percent slopes	5,405	0.8
22	Riverwash, sandy, frequently flooded	225	*
23A	Stuttgart silt loam, 0 to 1 percent slopes	99,350	15.0
23B	Stuttgart silt loam, 1 to 3 percent slopes	47,662	7.2
24A	Tichnor silt loam, 0 to 1 percent slopes, frequently flooded	38,835	5.9
25A	Tichnor silt loam, ponded, 0 to 1 percent slopes, frequently flooded	9,114	1.4
26C	Udipsamments, 0 to 8 percent slopes	540	*
27	Water	32,911	5.0
28B	Yancopin silty clay loam, 1 to 3 percent slopes, frequently flooded	6,852	1.0
29A	Yorktown silty clay, ponded, 0 to 1 percent slopes, frequently flooded	9,701	1.5
DAM	Dam	4	*
LVS	Levee	179	*
	Total	661,357	100.0

* Less than 0.1 percent.

Prime Farmland

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

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, 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 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

About 412,886 acres in the survey area, or nearly 62 percent of the total acreage, meets the soil requirements for prime farmland. Scattered areas of this land are throughout the county.

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 below. 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 at the back of this publication. The soil qualities that affect use and management are described under the heading “Detailed Soil Map Units.”

Some soils that have a seasonal high water table and all soils that are frequently flooded during the growing season qualify as prime farmland only in areas where these limitations have been overcome by drainage measures or flood control. The need for these measures is indicated after the map unit name below. Onsite evaluation is needed to determine whether or not these limitations have been overcome by corrective measures.

The soils identified as prime farmland in Arkansas County are:

2B	Desha silty clay, 0 to 3 percent slopes, occasionally flooded
3A	Dewitt silt loam, 0 to 1 percent slopes (where drained)
4B	Dubbs silt loam, 0 to 3 percent slopes
5B	Dundee silt loam, 0 to 2 percent slopes, occasionally flooded
6A	Ethel silt loam, 0 to 1 percent slopes (where drained)
8A	Hebert silt loam, 0 to 1 percent slopes
9A	Immanuel silt loam, 0 to 1 percent slopes
9B	Immanuel silt loam, 1 to 3 percent slopes
10A	Keo loam, 0 to 1 percent slopes, occasionally flooded
13A	Lagrue silty clay loam, 0 to 1 percent slopes (where drained)
14B	Muskogee silt loam, 1 to 3 percent slopes
15A	Oaklimeter silt loam, 0 to 1 percent slopes, occasionally flooded

16A Overcup silt loam, 0 to 1 percent slopes (where drained)
17A Perry clay, 0 to 1 percent slopes (where drained)
19A Portland clay, 0 to 1 percent slopes (where drained)
21A Rilla silt loam, 0 t 1 percent slopes
21B Rilla silt loam, 1 to 3 percent slopes
23A Stuttgart silt loam, 0 to 1 percent slopes
23B Stuttgart silt loam, 1 to 3 percent slopes

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations 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 for predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as rangeland and woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and for wildlife habitat. It can be used to identify the 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 that is in harmony with nature.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where 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.

Interpretive Ratings

The interpretive tables in this survey rate the soils in the survey area for various uses. Many of the tables identify the limitations that affect specified uses and indicate the severity of those limitations. The ratings in these tables are both verbal and numerical.

Rating Class Terms

Rating classes are expressed in the tables in terms that indicate the extent to which the soils are limited or not limited by all of the soil features that affect a specified use. Terms for the limitation classes are *not limited, slightly limited, moderately limited, limited,* and *very limited*. In certain tables, the soils are rated as *improbable, possible,* or *probable* sources of specific materials used for construction materials.

Numerical Ratings

Numerical ratings in the tables indicate the severity of individual limitations. They also indicate the overall degree to which a soil is limited or not limited for a specific use. The numerical ratings are shown as decimal fractions ranging from 0.00 to 1.00. Limitation classes are assigned as follows:

Not limited	0.00
Slightly limited	0.01 to 0.30
Moderately limited	0.31 to 0.60
Limited	0.61 to 0.99
Very limited	1.00

The numerical ratings used to express the severity of individual limitations indicate gradations between the point at which a soil feature has the greatest negative impact on the use and the point at which the soil feature is not a limitation.

In tables that use limitation class terms, such as *very limited* or *limited*, the limitation class terms and numerical ratings are shown for each limiting soil feature listed. As many as three soil features may be listed for each map unit component. The overall limitation rating for the component is based on the most severe limitation.

Crops and Pasture

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

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

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.

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

Land Capability Classification

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

The capability classification of map units in this survey area is given in the section “Detailed Soil Map Units” and in the yields table.

Forest Productivity and Management

The tables in this section can help forest owners or managers plan the use of soils for wood crops. Potential productivity of the soils for wood crops is provided in table 6. Interpretive ratings are provided for various aspects of forest management in tables 7a and 7b.

Forest Productivity

In table 6, 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 codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that forest managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability. More detailed information regarding site index is available in the “National Forestry Manual,” which is available in local offices of the Natural Resources Conservation Service or on the Internet.

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 and calculated at the age of culmination of the mean annual increment (CMAI), indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

Trees to manage are those that are preferred for planting, seeding, or natural regeneration and those that remain in the stand after thinning or partial harvest.

Forest Management

In tables 7a and 7b, interpretive ratings are given for various aspects of forest management. The ratings in the tables are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified aspect of forest management. *Not limited* indicates that the soil has features that are very favorable for the specified aspect of management. Good performance and very low maintenance can be expected. *Slightly limited* indicates that the soil has features that are favorable for the specified aspect of management. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. *Moderately limited* indicates that the soil has features that are moderately favorable for the specified aspect of management. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Limited* indicates that the soil has one or more features that are significant limitations for the specified aspect of management. The limitations can be overcome, but overcoming them generally requires special design, special planning, soil reclamation, specialized equipment, or other procedures that may result in additional expense. Fair performance and moderate or high maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified aspect of management. The limitations generally cannot be overcome without major soil reclamation, special design, specialized equipment, or other expensive procedures. Poor performance, unsafe conditions, or high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The numerical ratings are shown as decimal fractions ranging from 0.00 to 1.00. Limitation classes are assigned as follows:

Not limited	0.00
Slightly limited	0.01 to 0.30
Moderately limited	0.31 to 0.60
Limited	0.61 to 0.99
Very limited	1.00

The numerical ratings used to express the severity of individual limitations indicate gradations between the point at which a soil feature has the greatest negative impact on the use and the point at which the soil feature is not a limitation.

Limitation class terms and numerical ratings are shown for each limiting soil feature listed. As many as three soil features may be listed for each component. The overall limitation class for the component is based on the most severe limitation.

The paragraphs that follow indicate the soil properties considered in rating the soils for forest management factors. More detailed information about the criteria used in the ratings is available in the "National Forestry Manual," which is available in local offices of the Natural Resources Conservation Service or through the Agency's Website.

Ratings in the column *hand planting* are based on slope, depth to a restrictive layer, content of sand, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. Ratings indicate the expected difficulty of hand planting, which includes the proper placement of root systems of tree seedlings to a depth of up to 12 inches, using standard hand planting tools. It is assumed that necessary site preparation is completed before seedlings are planted.

Ratings in the column *mechanical planting* are based on slope, depth to a restrictive layer, content of sand, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. Ratings indicate the expected difficulty in using a mechanical planter, which includes proper placement of root systems of tree seedlings to a depth of up to 12 inches. It is assumed that necessary site preparation is completed before seedlings are planted.

Ratings in the column *harvest equipment* are based on slope, rock fragments on the surface, plasticity index, content of sand, surface texture, depth to a water table, and ponding. Ratings indicate the suitability for operating harvest equipment for off-road transport or harvest of logs and/or wood products by ground-based wheeled or tracked equipment.

Ratings in the column *mechanical site preparation (surface)* are based on slope, depth to a restrictive layer, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The part of the soil from the surface to a depth of about 12 inches is considered in the ratings. Ratings indicate the suitability of using surface-altering soil tillage equipment to prepare the site for planting or seeding.

Ratings in the column *roads (natural surface)* are based on slope, rock fragments on the surface, plasticity index, content of sand, surface texture, depth to a water table, ponding, flooding, and the hazard of soil slippage. The ratings indicate the suitability for using the natural surface of the soil for roads on which trucks transport logs and other wood products from the site.

In table 7b, ratings in the column *erosion on roads and trails* are based on the soil erodibility factor K, slope, and content of rock fragments. The ratings apply to unsurfaced roads and trails.

Ratings in the column *off-road or off-trail erosion* are based on slope and on the soil erodibility factor K. The soil loss is caused by sheet or rill erosion in off-road or off-trail areas where 50 to 75 percent of the surface has been exposed by logging, grazing, mining, or other kinds of disturbance.

Ratings in the column *soil rutting* are based on depth to a water table, rock fragments on or below the surface, surface texture, depth to a restrictive layer, and slope. Ruts form as a result of the operation of forest equipment. Ratings indicate limitations affecting the hazard or risk of ruts in the uppermost layers of the soil. Soil displacement and puddling (soil deformation and compaction) may occur simultaneously with the formation of ruts.

Ratings in the column *log landings* are based on slope, rock fragments on the surface, plasticity index, content of sand, surface texture, depth to a water table, ponding, flooding, and the hazard of soil slippage. Ratings indicate the suitability of the soil at the forest site to serve as a log landing and to allow the efficient and effective use of equipment for the temporary storage and handling of logs.

Ratings in the column *seedling survival* are based on flooding, ponding, depth to a water table, content of lime, reaction, salinity, available water capacity, soil moisture regime, soil temperature regime, aspect, and slope. Ratings indicate the impact of soil, physiographic, and climatic conditions on the survivability of newly established tree seedlings.

Recreation

The soils of the survey area are rated in table 8 according to limitations that affect their suitability for recreational use. Soils are rated for camp areas, picnic areas, playgrounds, and paths and trails.

The ratings in the table 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 also are important. Soils that are 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 ratings in the table are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect recreational site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Slightly limited* indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. *Moderately limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Limited* indicates that the soil has one or more features that are significant limitations for the specified use. The limitations can be overcome, but overcoming them generally requires special design, soil reclamation, or installation procedures that may result in additional expense. Fair performance and moderate or high maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The numerical ratings are shown as decimal fractions ranging from 0.00 to 1.00. Limitation classes are assigned as follows:

Not limited	0.00
Slightly limited	0.01 to 0.30
Moderately limited	0.31 to 0.60
Limited	0.61 to 0.99
Very limited	1.00

The numerical ratings used to express the severity of individual limitations indicate gradations between the point at which a soil feature has the greatest negative impact on the use and the point at which the soil feature is not a limitation.

Limitation class terms and numerical ratings are shown for each limiting soil feature listed. As many as three soil features may be listed for each component. The overall limitation rating for the component is based on the most severe limitation.

The information in table 8 can be supplemented by other information in this survey, for example, interpretations for building site development, construction materials, sanitary facilities, and water management.

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 soil properties that affect the performance of the areas after development are those that influence trafficability and promote the growth of vegetation, especially in heavily used areas. For good trafficability, the surface of camp areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The ratings are based on the soil properties that affect the ease of developing picnic areas and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of picnic areas. For good trafficability, the surface of picnic areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Playgrounds require soils that are nearly level, are free of stones, and can withstand intensive foot traffic. The ratings are based on the soil properties that affect the ease of developing playgrounds and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of playgrounds. For good trafficability, the surface of the playgrounds should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The ratings are based on the soil properties that affect trafficability and erodibility. These properties are stoniness, a water table, ponding, flooding, slope, and texture of the surface layer. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to frequent flooding during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Wildlife Habitat

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

In tables 9a and 9b, 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 ratings in the tables are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified use. *Not limited* indicates that the soil has features that are very favorable for the specified use. Habitat is easily established, improved, or maintained. *Slightly limited* indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Habitat can be established, improved, or maintained. *Moderately limited* indicates that the soil has features that are moderately favorable for the specified use. Habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. *Limited* indicates that the soil has one or more features that are significant limitations for the specified use. Habitat is difficult to create, improve, or maintain in most places. Management is difficult and must be very intensive. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. Habitat is usually impractical or impossible to create, improve, or maintain. Management would be very difficult, and unsatisfactory results can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The numerical ratings are shown as decimal fractions ranging from 0.00 to 1.00. Limitation classes are assigned as follows:

Not limited	0.00
Slightly limited	0.01 to 0.30
Moderately limited	0.31 to 0.60
Limited	0.61 to 0.99
Very limited	1.00

The numerical ratings used to express the severity of individual limitations indicate gradations between the point at which a soil feature has the greatest negative impact on the use and the point at which the soil feature is not a limitation.

Limitation class terms and numerical ratings are shown for each limiting soil feature listed. As many as three soil features may be listed for each component. The overall limitation class for the component is based on the most severe limitation.

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 are also considerations. Selection should be made from a list of locally adapted species.

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 are also considerations. Selection should be made from a list of locally adapted species.

Upland 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 are also considerations. Selection should be made from a list of locally adapted species.

Upland shrubs and vines are bushy woody plants that produce fruit, buds, twigs, bark, and foliage. Soil properties and features that affect the growth of shrubs and vines are depth of the root zone, available water capacity, salinity, and soil moisture. Selection should be made from a list of locally adapted species.

Upland deciduous 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 are depth of the root zone, available water capacity, and wetness. Selection should be made from a list of locally adapted species.

Upland mixed deciduous-conifer trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, browse, seeds and foliage. Soil properties and features that affect the growth of these trees are depth of the root zone, available water capacity, and wetness. Selection should be made from a list of locally adapted species.

Riparian herbaceous plants are annual and perennial native or naturally established grasses and forbs that grow on moist or wet sites. Soil properties and features affecting riparian herbaceous plants are surface texture, wetness, flooding, ponding, and surface stones. Selection should be made from a list of locally adapted species.

Riparian shrubs, vines, and trees are bushy woody plants and trees that grow on moist or wet sites. Soil properties and features affecting these plants are surface texture, wetness, flooding, ponding, and surface stones. Selection should be made from a list of locally adapted species.

Freshwater wetland plants are grasses, forbs, and shrubs that are adapted to wet soil conditions. The soils suitable for this habitat generally occur adjacent to springs, seeps, depressions, bottomlands, marshes, or backwater areas of flood plains. Most areas are ponded for some period of time during the year. Soil properties and features affecting these plants are surface texture, wetness, ponding, and soil reaction. Selection should be made from a list of locally adapted species.

Irrigated freshwater wetland plants are grasses, forbs, and shrubs that are adapted to wet soil conditions. The soils suitable for this habitat generally occur in areas of cropland, previously cropped areas, and marginal areas associated with cropland and wetlands. These areas may be ponded for some period of time during the year. These areas are generally suitable for restoring wetland features temporarily or permanently. Soil properties and features affecting these plants are surface texture, permeability, wetness, ponding, and soil reaction. Selection should be made from a list of locally adapted species.

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, water management, and waste 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 within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

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

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

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the 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; evaluate sites for agricultural waste management; 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

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. Table 10 shows the degree and kind of soil limitations that affect dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping.

The ratings in the table are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Slightly limited* indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. *Moderately limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Limited* indicates that the soil has one or more features that are significant limitations for the specified use. The limitations can be overcome, but overcoming them generally requires special design, soil reclamation, or installation procedures that may result in additional expense. Fair performance and moderate or high maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The numerical ratings are shown as decimal fractions ranging from 0.00 to 1.00. Limitation classes are assigned as follows:

Not limited	0.00
Slightly limited	0.01 to 0.30
Moderately limited	0.31 to 0.60
Limited	0.61 to 0.99
Very limited	1.00

The numerical ratings used to express the severity of individual limitations indicate gradations between the point at which a soil feature has the greatest negative impact on the use and the point at which the soil feature is not a limitation.

Limitation class terms and numerical ratings are shown for each limiting soil feature listed. As many as three soil features may be listed for each component. The overall limitation rating for the component is based on the most severe limitation.

Dwellings are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Small commercial buildings are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

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 soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, a water table, and ponding.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer.

Sanitary Facilities

The soils of the survey area are rated in table 11 according to limitations that affect their suitability for sanitary facilities. Soils are rated for septic tank absorption fields, sewage lagoons, sanitary landfills, and daily cover for landfill.

The ratings in the table are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect sanitary facilities. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Slightly limited* indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. *Moderately limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Limited* indicates that the soil has one or more features that are significant limitations for the specified use. The limitations can be overcome, but overcoming them generally requires special design, soil reclamation, or installation procedures that may result in additional expense. Fair performance and moderate or high maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The numerical ratings are shown as decimal fractions ranging from 0.00 to 1.00. Limitation classes are assigned as follows:

Not limited	0.00
Slightly limited	0.01 to 0.30
Moderately limited	0.31 to 0.60
Limited	0.61 to 0.99
Very limited	1.00

The numerical ratings used to express the severity of individual limitations indicate gradations between the point at which a soil feature has the greatest negative impact on the use and the point at which the soil feature is not a limitation.

Limitation class terms and numerical ratings are shown for each limiting soil feature listed. As many as three soil features may be listed for each component. The overall limitation rating for the component is based on the most severe limitation.

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, 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 be contaminated. Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, hillside seepage, and contamination of ground water, can affect public health.

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, 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, 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, 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 soil within 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 *area 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, 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, 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 and Excavating

The soils of the survey area are rated in table 12 as a source of roadfill, sand, gravel, or topsoil. Normal compaction, minor processing, and other standard construction practices are assumed. The soils are also rated according to limitations that affect their suitability for shallow excavations. The ratings in the table are both verbal and numerical.

Rating class terms, as follows, are used to indicate the extent to which the soils are limited by soil features that affect their use as a source for roadfill, sand, gravel, or topsoil or their suitability for shallow excavations. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Slightly limited* indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. *Moderately limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Limited* indicates that the soil has one or more features that are significant limitations for the specified use. The limitations can be overcome, but overcoming them generally requires special design, soil reclamation, or installation procedures that may result in additional expense. Fair performance and moderate or high maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The numerical ratings are shown as decimal fractions ranging from 0.00 to 1.00. Limitation classes are assigned as follows:

Not limited	0.00
Slightly limited	0.01 to 0.30
Moderately limited	0.31 to 0.60
Limited	0.61 to 0.99
Very limited	1.00

The numerical ratings used to express the severity of individual limitations indicate gradations between the point at which a soil feature has the greatest negative impact on the use and the point at which the soil feature is not a limitation.

Limitation class terms and numerical ratings are shown for each limiting soil feature listed. As many as three soil features may be listed for each component. The overall limitation rating for the component is based on the most severe limitation.

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 whole soil, from the surface to a depth of about 5 feet. It is assumed that soil layers will be mixed when the soil material is excavated and spread.

The ratings are based on the amount of suitable material and on soil properties that affect the ease of excavation and the performance of the material after it is in place. The thickness of the suitable material is a major consideration. The ease of excavation is affected by large stones, a 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 AASHTO classification of the soil) and linear extensibility (shrink-swell potential).

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In the table, 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 Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the lowest layer of the soil contains sand or gravel, the soil is rated as a probable source regardless of the thickness. The assumption is that the sand or gravel layer below the depth of observation exceeds the minimum thickness.

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. The ratings are based on the soil properties that affect plant growth; the ease of excavating, loading, and spreading the material; and reclamation of the borrow area. Toxic substances, soil reaction, and the properties that are inferred from soil texture, such as available water capacity and fertility, affect plant growth. 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, depth to bedrock or a cemented pan, and toxic material.

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.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

Water Management

The soils of the survey area are rated in table 13 according to limitations that affect their suitability for water management. Soils are rated for pond reservoir areas, drainage, irrigation, terraces and diversions, and grassed waterways. Restrictive features that affect each soil for the specified use are also listed in the table.

The ratings in the table are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified use. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Slightly limited* indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. *Moderately limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Limited* indicates that the soil has one or more features that are significant limitations for the specified use. The limitations can be overcome, but overcoming them generally requires special design, soil reclamation, or installation procedures that may result in additional expense. Fair performance and moderate or high maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The numerical ratings are shown as decimal fractions ranging from 0.00 to 1.00. Limitation classes are assigned as follows:

Not limited	0.00
Slightly limited	0.01 to 0.30
Moderately limited	0.31 to 0.60
Limited	0.61 to 0.99
Very limited	1.00

The numerical ratings used to express the severity of individual limitations indicate gradations between the point at which a soil feature has the greatest negative impact on the use and the point at which the soil feature is not a limitation.

Limitation class terms and numerical ratings are shown for each limiting soil feature listed. As many as three soil features may be listed for each component. The overall limitation rating for the component is based on the most severe limitation.

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. Slope can affect the storage capacity of the reservoir area.

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, permeability, depth to a water table, ponding, slope, and flooding. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or a cemented pan, large stones, slope, and the likelihood that cutbanks will cave. 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. The 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 a water table, ponding, flooding, available water capacity, intake rate, permeability, erodibility, and slope. The construction of a system is affected by large stones and depth to bedrock. The performance of a system is affected by the depth of the root zone, reaction, and the amount of salts, sodium, sulfur, lime, or gypsum.

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, a water table, ponding, large stones, and depth to bedrock affect the construction of terraces and diversions. A restricted rooting depth, erodibility, 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, a water table, slope, and depth to bedrock affect the construction of grassed waterways. Erodibility, soil moisture regime, available water capacity, restricted rooting depth, restricted permeability, and toxic substances, such as salts and sodium, affect the growth and maintenance of the grass after construction.

Waste Management

Soil properties are important considerations in areas where soils are used as sites for the treatment and disposal of organic waste and wastewater. Selection of soils with properties that favor waste management can help to prevent environmental damage.

Table 14 shows the degree and kind of soil limitations affecting the treatment of agricultural waste, including municipal and food-processing wastewater and effluent from lagoons or storage ponds. Municipal wastewater is the waste stream from a municipality. It contains domestic waste and may contain industrial waste. It may have received primary or secondary treatment. It is rarely untreated sewage. Food-processing wastewater results from the preparation of fruits, vegetables, milk, cheese, and meats for public consumption. In places it is high in content of sodium and chloride. In the context of this table, the effluent in lagoons and storage ponds is from facilities used to treat or store food-processing wastewater or domestic or animal waste. Domestic and food-processing wastewater is very dilute, and the effluent from the facilities that treat or store it commonly is very low in content of carbonaceous and nitrogenous material; the content of nitrogen commonly ranges from 10 to 30 mg/l. The wastewater from animal waste treatment lagoons or storage ponds, however, has much higher concentrations of these materials, mainly because the manure has not been diluted as much as the domestic waste. The content of nitrogen in this wastewater generally ranges from 50 to 2,000 mg/l. When wastewater is applied, checks should be made to ensure that nitrogen, heavy metals, and salts are not added in excessive amounts.

The ratings in the table are for waste management systems that not only dispose of and treat organic waste or wastewater but also are beneficial to crops (application of manure and food-processing waste, application of sewage sludge, and disposal of wastewater through irrigation) and for waste management systems that are designed only for the purpose of wastewater disposal and treatment (slow rate treatment of wastewater and rapid infiltration of wastewater).

The ratings in the table are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified use. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Slightly limited* indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. *Moderately limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Limited* indicates that the soil has one or more features that are significant limitations for the specified use. The limitations can be overcome, but overcoming them generally requires special design, soil reclamation, or installation procedures that may result in additional expense. Fair performance and moderate or high maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The numerical ratings are shown as decimal fractions ranging from 0.00 to 1.00. Limitation classes are assigned as follows:

Not limited	0.00
Slightly limited	0.01 to 0.30
Moderately limited	0.31 to 0.60
Limited	0.61 to 0.99
Very limited	1.00

The numerical ratings used to express the severity of individual limitations indicate gradations between the point at which a soil feature has the greatest negative impact on the use and the point at which the soil feature is not a limitation.

Limitation class terms and numerical ratings are shown for each limiting soil feature listed. As many as three soil features may be listed for each component. The overall limitation rating for the component is based on the most severe limitation.

Land application of manure and food-processing waste not only disposes of waste material but also improves crop production by increasing the supply of nutrients in the soils where the material is applied. Manure is the excrement of livestock and poultry, and food-processing waste is damaged fruit and vegetables and the peelings, stems, leaves, pits, and soil particles removed in food preparation. The manure and food-processing waste are either solid, slurry, or liquid. Their nitrogen content varies. A high content of nitrogen limits the application rate. Toxic or otherwise dangerous wastes, such as those mixed with the lye used in food processing, are not considered in the ratings.

The ratings are based on the soil properties that affect absorption, plant growth, microbial activity, erodibility, the rate at which the waste is applied, and the method by which the waste is applied. The properties that affect absorption include permeability, a water table, ponding, the sodium adsorption ratio, depth to bedrock or a cemented pan, and available water capacity. The properties that affect plant growth and microbial activity include reaction, the sodium adsorption ratio, salinity, and bulk density. The wind erodibility group, the soil erodibility factor K, and slope are considered in estimating the likelihood of wind erosion or water erosion. Stones, cobbles, a water table, ponding, and flooding can hinder the application of waste.

Land application of municipal sewage sludge not only disposes of waste material but also improves crop production by increasing the supply of nutrients in the soils where the material is applied. In the context of this table, sewage sludge is the residual product of the treatment of municipal sewage. The solid component consists mainly of cell mass, primarily bacteria cells that developed during secondary treatment and have incorporated soluble organics into their own bodies. The sludge has small amounts of sand, silt, and other solid debris. The content of nitrogen varies. Some sludge has constituents that are toxic to plants or hazardous to the food chain, such as heavy metals and exotic organic compounds, and should be analyzed chemically prior to use.

The content of water in the sludge ranges from about 98 percent to less than 40 percent. The sludge is considered liquid if it is more than about 90 percent water, slurry if it is about 50 to 90 percent water, and solid if it is less than about 50 percent water.

The ratings in the table are based on the soil properties that affect absorption, plant growth, microbial activity, erodibility, the rate at which the sludge is applied, and the method by which the sludge is applied. The properties that affect absorption, plant growth, and microbial activity include permeability, a water table, ponding, the sodium adsorption ratio, depth to bedrock or a cemented pan, available water capacity, reaction, salinity, and bulk density. The wind erodibility group, the soil erodibility factor K, and slope are considered in estimating the likelihood of wind erosion or water erosion. Stones, cobbles, a water table, ponding, and flooding can hinder the application of sludge.

Disposal of wastewater by irrigation not only disposes of municipal wastewater and wastewater from food-processing plants, lagoons, and storage ponds but also improves crop production by increasing the amount of water available to crops. The ratings in the table are based on the soil properties that affect the design, construction, management, and performance of the irrigation system. The properties that affect design and management include the sodium adsorption ratio, a water table, ponding, available water capacity, permeability, slope, and flooding. The properties that affect construction include stones, cobbles, depth to bedrock or a cemented pan, a water table, and ponding. The properties that affect performance include depth to bedrock or a cemented pan, bulk density, the sodium adsorption ratio, salinity, reaction, and the cation-exchange capacity, which is used to estimate the capacity of a soil to adsorb heavy metals.

Slow rate treatment of wastewater is a process in which wastewater is applied to land at a rate normally between 0.5 inch and 4.0 inches per week. The application rate commonly exceeds the rate needed for irrigation of cropland. The applied wastewater is treated as it moves through the soil. Much of the treated water percolates to the ground water, and some enters the atmosphere through evapotranspiration. The applied water generally is not allowed to run off the surface. Waterlogging is prevented either through control of the application rate or through the use of tile drains, or both.

The ratings in the table are based on the soil properties that affect absorption, plant growth, microbial activity, erodibility, and the application of waste. The properties that affect absorption include the sodium adsorption ratio, a water table, ponding, available water capacity, permeability, depth to bedrock or a cemented pan, reaction, the cation-exchange capacity, and slope. Reaction, the sodium adsorption ratio, salinity, and bulk density affect plant growth and microbial activity. The wind erodibility group, the soil erodibility factor K, and slope are considered in estimating the likelihood of wind erosion or water erosion. Stones, cobbles, a water table, ponding, and flooding can hinder the application of waste.

Rapid infiltration of wastewater is a process in which wastewater applied in a level basin at a rate of 4 to 120 inches per week percolates through the soil, eventually reaching the ground water. The application rate commonly exceeds the rate needed for irrigation of cropland. Vegetation is not a necessary part of the treatment; hence, the basins may or may not be vegetated. The thickness of the soil material needed for proper treatment of the wastewater is more than 72 inches. As a result, geologic and hydrologic investigation is needed to ensure proper design and performance and to determine the risk of ground-water pollution.

The ratings in the table are based on the soil properties that affect the risk of pollution and the design, construction, and performance of the system. A water table, ponding, flooding, and depth to bedrock or a cemented pan affect the risk of pollution and the design and construction of the system. Slope, stones, and cobbles also affect design and construction. Permeability and reaction affect performance.

Table 5.--Land Capability and Yields per Acre of Crops and Pasture

(Yields are those that can be expected under a high level of management. They are for nonirrigated areas. 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	Common bermudagrass	Corn	Grain sorghum	Rice	Soybeans	Tall fescue	Wheat
		AUM	Bu	Bu	Bu	Bu	AUM	Bu
1C:								
Crevasse	4s	4.50	---	---	---	---	5.00	---
2B:								
Desha	3w	6.00	---	---	---	30.00	7.00	---
3A:								
Dewitt	3w	6.00	---	---	---	30.00	8.50	40.00
4B:								
Dubbs	2e	8.00	90.00	---	---	35.00	10.00	50.00
5B:								
Dundee	3w	7.00	80.00	---	---	30.00	8.00	35.00
6A:								
Ethel	3w	6.00	---	---	---	30.00	8.50	40.00
7A:								
Forestdale	4w	5.00	---	---	---	---	---	---
8A:								
Hebert	2w	8.00	85.00	---	---	35.00	---	45.00
9A:								
Immanuel	2w	8.00	130.00	---	---	35.00	8.50	50.00
9B:								
Immanuel	2e	8.00	120.00	---	---	30.00	8.00	40.00
9C:								
Immanuel	3e	6.00	85.00	---	---	20.00	7.00	35.00
9D:								
Immanuel	4e	5.50	---	---	---	---	6.50	---
9E:								
Immanuel	6e	---	---	---	---	---	5.00	---
10A:								
Keo	2w	8.00	95.00	95.00	---	40.00	---	40.00
10C:								
Keo	2e	7.00	80.00	80.00	---	30.00	---	35.00
11A:								
Kobel	4w	5.00	---	---	---	25.00	5.00	---
12A:								
Kobel	7w	---	---	---	---	---	---	---
13A:								
Lagrue	3w	6.50	---	60.00	---	30.00	---	---
14B:								
Muskogee	2e	7.00	60.00	---	---	25.00	6.50	35.00
14C:								
Muskogee	3e	7.00	55.00	---	---	20.00	6.00	30.00

Table 5.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Common bermudagrass	Corn	Grain sorghum	Rice	Soybeans	Tall fescue	Wheat
		AUM	Bu	Bu	Bu	Bu	AUM	Bu
14D: Muskogee------	4e	6.00	---	---	---	---	5.00	---
15A: Oaklimeter----	2w	9.00	95.00	---	---	35.00	10.00	40.00
16A: Overcup-------	3w	6.00	---	90.00	---	30.00	6.00	---
17A: Perry---------	3w	6.50	---	65.00	---	30.00	7.50	---
18A: Perry---------	4w	5.00	---	---	---	30.00	---	---
19A: Portland------	3w	6.50	---	85.00	---	35.00	7.50	---
20A: Portland------	4w	6.00	---	80.00	---	30.00	6.00	---
21A: Rilla---------	1	8.00	95.00	95.00	---	40.00	---	60.00
21B: Rilla---------	2e	7.50	85.00	90.00	---	35.00	---	55.00
22: Riverwash-----	8w	---	---	---	---	---	---	---
23A: Stuttgart-----	2w	7.50	---	---	---	35.00	8.00	40.00
23B: Stuttgart-----	2e	7.50	---	---	---	30.00	8.00	35.00
24A: Tichnor-------	4w	6.00	---	80.00	---	30.00	5.00	---
25A: Tichnor-------	7w	---	---	---	---	---	---	---
26C: Udipsamments--	7s	---	---	---	---	---	---	---
27. Water								
28B: Yancopin------	4w	7.00	---	---	---	30.00	6.00	---
29A: Yorktown------	7w	---	---	---	---	---	---	---
DAM. Dam								
LVS. Levee								

Table 6.--Forest Productivity

(Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available.)

Map symbol and soil name	Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
1C:				
Crevasse	eastern cottonwood	80	86	---
	sweetgum	90	---	
2B:				
Desha	cherrybark oak	80	86	eastern cottonwood, Nuttall oak, sweetgum, water oak, willow oak
	eastern cottonwood	90	---	
	green ash	75	---	
	water hickory	---	---	
	water oak	80	---	
3A:				
Dewitt	cherrybark oak	---	---	cherrybark oak, green ash, loblolly pine, shortleaf pine, water oak
	loblolly pine	80	114	
	sweetgum	---	---	
	water oak	---	---	
4B:				
Dubbs	cherrybark oak	100	143	American sycamore, eastern cottonwood, green ash, Nuttall oak, sweetgum
	eastern cottonwood	100	---	
	green ash	80	---	
	Nuttall oak	95	---	
	Shumard's oak	100	---	
	sweetgum	95	---	
	water oak	90	---	
	willow oak	95	---	
5B:				
Dundee	cherrybark oak	100	143	---
	eastern cottonwood	100	---	
	sweetgum	100	---	
	water oak	95	---	
6A:				
Ethel	cherrybark oak	---	---	cherrybark oak, green ash, loblolly pine, shortleaf pine, water oak
	loblolly pine	80	114	
	sweetgum	---	---	
	water oak	---	---	
7A:				
Forestdale	cherrybark oak	80	86	American sycamore, eastern cottonwood, green ash, Nuttall oak, sweetgum
	eastern cottonwood	100	---	
	green ash	78	---	
	Nuttall oak	99	---	
	sweetgum	100	---	
	water oak	90	---	
	willow oak	94	---	
8A:				
Hebert	American sycamore	---	---	cherrybark oak, Shumard's oak, water oak
	cherrybark oak	95	129	
	eastern cottonwood	95	---	
	green ash	---	---	
	Nuttall oak	90	---	
	pecan	---	---	
	sweetgum	90	---	
	water oak	90	---	

Table 6.--Forest Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
9A, 9B, 9C, 9D, 9E:				
Immanuel	cherrybark oak	85	---	cherrybark oak, loblolly pine, shortleaf pine, Shumard's oak, sweetgum, water oak, white oak
	loblolly pine	90	129	
	shortleaf pine	75	---	
	southern red oak	80	---	
	sweetgum	80	---	
10A, 10C:				
Keo	cherrybark oak	100	143	cherrybark oak, Nuttall oak, willow oak
	green ash	95	---	
	sweetgum	95	---	
	willow oak	90	---	
11A:				
Kobel	cherrybark oak	80	86	cherrybark oak, eastern cottonwood, green ash, water oak
	eastern cottonwood	90	---	
	green ash	75	---	
	water hickory	---	---	
	water oak	80	---	
12A:				
Kobel	baldcypress	70	---	baldcypress, green ash, water tupelo
	green ash	---	---	
	water hickory	---	---	
	water tupelo	55	72	
13A:				
Lagrue	cherrybark oak	90	114	green ash, Nuttall oak, water oak
	green ash	85	---	
	honeylocust	---	---	
	sugarberry	---	---	
	sweetgum	90	---	
	water oak	90	---	
14B, 14C, 14D:				
Muskogee	loblolly pine	90	129	loblolly pine, shortleaf pine, sweetgum, water oak
	shortleaf pine	75	---	
	southern red oak	---	---	
	sweetgum	80	---	
	water oak	---	---	
15A:				
Oaklimeter	cherrybark oak	100	---	cherrybark oak, eastern cottonwood, loblolly pine, Nuttall oak, sweetgum, water
	eastern cottonwood	100	---	
	green ash	90	---	
	loblolly pine	90	129	
	Nuttall oak	100	---	
	sweetgum	100	---	
	willow oak	100	---	
16A:				
Overcup	cherrybark oak	90	114	cherrybark oak, Nuttall oak, willow oak
	green ash	80	---	
	sweetgum	90	---	
	water oak	90	---	
	willow oak	90	---	

Table 6.--Forest Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
17A:				
Perry	cherrybark oak	80	86	cherrybark oak, Nuttall oak
	honeylocust	---	---	
	Nuttall oak	---	---	
	sugarberry	---	---	
	sweetgum	92	---	
	water oak	---	---	
18A:				
Perry	baldcypress	---	---	baldcypress, cherrybark oak, green ash
	cherrybark oak	70	72	
	green ash	70	---	
	overcup oak	---	---	
	sweetgum	70	---	
	water hickory	---	---	
19A:				
Portland	eastern cottonwood	100	---	eastern cottonwood, Nuttall oak, sweetgum, water oak
	green ash	80	---	
	Nuttall oak	90	114	
	sweetgum	90	---	
	water oak	90	---	
20A:				
Portland	eastern cottonwood	90	---	baldcypress, eastern cottonwood, Nuttall oak, sweetgum, water oak
	green ash	70	---	
	Nuttall oak	80	100	
	sweetgum	80	---	
	water oak	85	---	
21A, 21B:				
Rilla	American sycamore	---	---	cherrybark oak, pecan, Shumard's oak, water oak
	cherrybark oak	100	143	
	eastern cottonwood	100	---	
	Nuttall oak	85	---	
	pecan	---	---	
	sweetgum	100	---	
	water oak	---	---	
23A, 23B:				
Stuttgart	cherrybark oak	70	---	cherrybark oak, loblolly pine, shortleaf pine, Shumard's oak, southern red oak, willow oak
	loblolly pine	80	114	
	shortleaf pine	70	---	
	sweetgum	80	---	
24A:				
Tichnor	cherrybark oak	80	86	cherrybark oak, eastern cottonwood, Nuttall oak, water oak
	eastern cottonwood	106	---	
	Nuttall oak	100	---	
	sweetgum	100	---	
25A:				
Tichnor	baldcypress	70	---	baldcypress, green ash, water tupelo
	green ash	---	---	
	water hickory	---	---	
	water tupelo	55	72	
26C:				
Udipsamments	eastern cottonwood	80	86	eastern cottonwood, loblolly pine

Table 6.--Forest Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
28B:				
Yancopin	eastern cottonwood	113	172	American sycamore, eastern cottonwood, green ash, overcup oak, water oak
	Nuttall oak	---	---	
	overcup oak	---	---	
	water hickory	---	---	
29A:				
Yorktown	baldcypress	75	43	baldcypress, green ash, water tupelo
	green ash	---	---	
	water hickory	---	---	
	water tupelo	---	---	

Table 7a.--Forest Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Hand planting		Mechanical planting		Use of harvesting equipment		Mechanical site preparation (surface)		Roads (natural surface)	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1C: Crevasse	Not limited		Not limited		Not limited		Not limited		Moderately limited	
									~flooding (moderately limited)	0.60
2B: Desha	Limited		Limited		Limited		Limited		Limited	
	~stickiness (surface) (limited)	0.75	~stickiness (surface) (limited)	0.75	~seasonal wetness (limited)	0.76	~seasonal wetness (limited)	0.76	~seasonal wetness (limited)	0.76
	~seasonal wetness (moderately limited)	0.60	~seasonal wetness (moderately limited)	0.60	~stickiness (surface) (limited)	0.75	~stickiness (surface) (limited)	0.75	~stickiness (surface) (limited)	0.75
					~low strength (moderately limited)	0.50			~flooding (moderately limited)	0.60
3A: Dewitt	Moderately limited		Moderately limited		Limited		Limited		Limited	
	~seasonal wetness (moderately limited)	0.60	~seasonal wetness (moderately limited)	0.60	~seasonal wetness (limited)	0.62	~seasonal wetness (limited)	0.62	~seasonal wetness (limited)	0.62
					~low strength (moderately limited)	0.50			~low strength (moderately limited)	0.50
4B: Dubbs	Not limited		Not limited		Moderately limited		Not limited		Moderately limited	
					~low strength (moderately limited)	0.50			~low strength (moderately limited)	0.50
5B: Dundee	Not limited		Not limited		Moderately limited		Slightly limited		Moderately limited	
					~low strength (moderately limited)	0.50	~seasonal wetness (slightly limited)	0.10	~flooding (moderately limited)	0.60
					~seasonal wetness (slightly limited)	0.10			~low strength (moderately limited)	0.50
									~seasonal wetness (slightly limited)	0.10
6A: Ethel	Moderately limited		Moderately limited		Limited		Limited		Limited	
	~seasonal wetness (moderately limited)	0.60	~seasonal wetness (moderately limited)	0.60	~seasonal wetness (limited)	0.62	~seasonal wetness (limited)	0.62	~seasonal wetness (limited)	0.62
					~low strength (moderately limited)	0.50			~low strength (moderately limited)	0.50

Table 7a.--Forest Management--Continued

Map symbol and soil name	Hand planting: Rating class and limiting features	Value	Mechanical planting: Rating class and limiting features	Value	Use of harvesting equipment: Rating class and limiting features	Value	Mechanical site preparation (surface): Rating class and limiting features	Value	Roads (natural surface): Rating class and limiting features	Value
7A:										
Forestdale-----	Moderately limited		Moderately limited		Moderately limited		Moderately limited		Very limited	
	~stickiness (surface)	0.50	~stickiness (surface)	0.50	~stickiness (surface)	0.50	~stickiness (surface)	0.50	~flooding	1.00
	(moderately limited)		(moderately limited)		(moderately limited)		(moderately limited)		(very limited)	
					~low strength	0.50	~seasonal wetness	0.45	~stickiness (surface)	0.50
					(moderately limited)		(moderately limited)		(moderately limited)	
					~seasonal wetness	0.45			~low strength	0.50
					(moderately limited)				(moderately limited)	
8A:										
Hebert---------	Not limited		Not limited		Moderately limited		Slightly limited		Moderately limited	
					~low strength	0.50	~seasonal wetness	0.15	~low strength	0.50
					(moderately limited)		(slightly limited)		(moderately limited)	
					~seasonal wetness	0.15			~seasonal wetness	0.15
					(slightly limited)				(slightly limited)	
9A, 9B:										
Immanuel-------	Not limited		Not limited		Moderately limited		Slightly limited		Moderately limited	
					~low strength	0.50	~seasonal wetness	0.20	~low strength	0.50
					(moderately limited)		(slightly limited)		(moderately limited)	
					~seasonal wetness	0.20			~seasonal wetness	0.20
					(slightly limited)				(slightly limited)	
9C:										
Immanuel-------	Not limited		Slightly limited		Moderately limited		Slightly limited		Moderately limited	
			~slope	0.05	~low strength	0.50	~seasonal wetness	0.20	~low strength	0.50
			(slightly limited)		(moderately limited)		(slightly limited)		(moderately limited)	
					~seasonal wetness	0.20			~seasonal wetness	0.20
					(slightly limited)				(slightly limited)	
9D:										
Immanuel-------	Not limited		Moderately limited		Moderately limited		Slightly limited		Limited	
			~slope	0.45	~low strength	0.50	~seasonal wetness	0.20	~slope	0.72
			(moderately limited)		(moderately limited)		(slightly limited)		(limited)	
					~seasonal wetness	0.20			~low strength	0.50
					(slightly limited)				(moderately limited)	
									~seasonal wetness	0.20
									(slightly limited)	
9E:										
Immanuel-------	Slightly limited		Limited		Moderately limited		Moderately limited		Very limited	
	~slope	0.07	~slope	0.80	~low strength	0.50	~slope	0.30	~slope	1.00
	(slightly limited)		(limited)		(moderately limited)		(moderately limited)		(very limited)	
					~slope	0.30	~seasonal wetness	0.20	~low strength	0.50
					(moderately limited)		(slightly limited)		(moderately limited)	
					~seasonal wetness	0.20			~seasonal wetness	0.20
					(slightly limited)				(slightly limited)	

Table 7a.--Forest Management--Continued

Map symbol and soil name	Hand planting: Rating class and limiting features	Hand planting: Value	Mechanical planting: Rating class and limiting features	Mechanical planting: Value	Use of harvesting equipment: Rating class and limiting features	Use of harvesting equipment: Value	Mechanical site preparation (surface): Rating class and limiting features	Mechanical site preparation (surface): Value	Roads (natural surface): Rating class and limiting features	Roads (natural surface): Value
10A, 10C:										
Keo	Not limited		Not limited		Moderately limited		Not limited		Moderately limited	
					~low strength (moderately limited)	0.50			~flooding (moderately limited)	0.60
									~low strength (moderately limited)	0.50
11A:										
Kobel	Limited		Limited		Limited		Limited		Very limited	
	~stickiness (surface) (limited)	0.75	~stickiness (surface) (limited)	0.75	~seasonal wetness (limited)	0.91	~seasonal wetness (limited)	0.91	~flooding (very limited)	1.00
	~seasonal wetness (moderately limited)	0.60	~seasonal wetness (moderately limited)	0.60	~stickiness (surface) (limited)	0.75	~stickiness (surface) (limited)	0.75	~seasonal wetness (limited)	0.91
					~low strength (moderately limited)	0.50			~stickiness (surface) (limited)	0.75
12A:										
Kobel	Limited		Limited		Limited		Limited		Very limited	
	~seasonally ponded (limited)	0.80	~seasonally ponded (limited)	0.80	~seasonal wetness (limited)	0.91	~seasonal wetness (limited)	0.91	~ponded (wetness) (very limited)	1.00
	~stickiness (surface) (limited)	0.75	~stickiness (surface) (limited)	0.75	~seasonally ponded (limited)	0.80	~seasonally ponded (limited)	0.80	~flooding (very limited)	1.00
	~seasonal wetness (moderately limited)	0.60	~seasonal wetness (moderately limited)	0.60	~stickiness (surface) (limited)	0.75	~stickiness (surface) (limited)	0.75	~seasonal wetness (limited)	0.91
13A:										
Lagrue	Moderately limited		Moderately limited		Limited		Limited		Limited	
	~seasonal wetness (moderately limited)	0.60	~seasonal wetness (moderately limited)	0.60	~seasonal wetness (limited)	0.91	~seasonal wetness (limited)	0.91	~seasonal wetness (limited)	0.91
	~stickiness (surface) (moderately limited)	0.50	~stickiness (surface) (moderately limited)	0.50	~stickiness (surface) (moderately limited)	0.50	~stickiness (surface) (moderately limited)	0.50	~stickiness (surface) (moderately limited)	0.50
					~low strength (moderately limited)	0.50			~low strength (moderately limited)	0.50
14B:										
Muskogee	Not limited		Not limited		Moderately limited		Slightly limited		Moderately limited	
					~low strength (moderately limited)	0.50	~seasonal wetness (slightly limited)	0.29	~low strength (moderately limited)	0.50
					~seasonal wetness (slightly limited)	0.29			~seasonal wetness (slightly limited)	0.29
14C:										
Muskogee	Not limited		Slightly limited		Moderately limited		Slightly limited		Moderately limited	
			~slope (slightly limited)	0.05	~low strength (moderately limited)	0.50	~seasonal wetness (slightly limited)	0.29	~low strength (moderately limited)	0.50
					~seasonal wetness (slightly limited)	0.29			~seasonal wetness (slightly limited)	0.29

Table 7a.--Forest Management--Continued

Map symbol and soil name	Hand planting: Rating class and limiting features	Value	Mechanical planting: Rating class and limiting features	Value	Use of harvesting equipment: Rating class and limiting features	Value	Mechanical site preparation (surface): Rating class and limiting features	Value	Roads (natural surface): Rating class and limiting features	Value
14D:										
Muskogee-------	Not limited		Moderately limited		Moderately limited		Slightly limited		Limited	
			~slope (moderately limited)	0.45	~low strength (moderately limited)	0.50	~seasonal wetness (slightly limited)	0.29	~slope (limited)	0.72
					~seasonal wetness (slightly limited)	0.29			~low strength (moderately limited)	0.50
									~seasonal wetness (slightly limited)	0.29
15A:										
Oaklimeter-----	Not limited		Not limited		Moderately limited		Slightly limited		Moderately limited	
					~low strength (moderately limited)	0.50	~seasonal wetness (slightly limited)	0.20	~flooding (moderately limited)	0.60
					~seasonal wetness (slightly limited)	0.20			~low strength (moderately limited)	0.50
									~seasonal wetness (slightly limited)	0.20
16A:										
Overcup--------	Moderately limited		Moderately limited		Limited		Limited		Limited	
	~seasonal wetness (moderately limited)	0.60	~seasonal wetness (moderately limited)	0.60	~seasonal wetness (limited)	0.91	~seasonal wetness (limited)	0.91	~seasonal wetness (limited)	0.91
					~low strength (moderately limited)	0.50			~low strength (moderately limited)	0.50
17A:										
Perry----------	Limited		Limited		Limited		Limited		Limited	
	~stickiness (surface) (limited)	0.75	~stickiness (surface) (limited)	0.75	~stickiness (surface) (limited)	0.75	~stickiness (surface) (limited)	0.75	~stickiness (surface) (limited)	0.75
	~seasonal wetness (moderately limited)	0.60	~seasonal wetness (moderately limited)	0.60	~seasonal wetness (limited)	0.62	~seasonal wetness (limited)	0.62	~seasonal wetness (limited)	0.62
					~low strength (moderately limited)	0.50			~low strength (moderately limited)	0.50
18A:										
Perry----------	Limited		Limited		Limited		Limited		Very limited	
	~stickiness (surface) (limited)	0.75	~stickiness (surface) (limited)	0.75	~stickiness (surface) (limited)	0.75	~stickiness (surface) (limited)	0.75	~flooding (very limited)	1.00
	~seasonal wetness (moderately limited)	0.60	~seasonal wetness (moderately limited)	0.60	~seasonal wetness (limited)	0.62	~seasonal wetness (limited)	0.62	~stickiness (surface) (limited)	0.75
					~low strength (moderately limited)	0.50			~seasonal wetness (limited)	0.62

Table 7a.--Forest Management--Continued

Map symbol and soil name	Hand planting: Rating class and limiting features	Value	Mechanical planting: Rating class and limiting features	Value	Use of harvesting equipment: Rating class and limiting features	Value	Mechanical site preparation (surface): Rating class and limiting features	Value	Roads (natural surface): Rating class and limiting features	Value
19A:										
Portland	Limited		Limited		Limited		Limited		Limited	
	~stickiness (surface) (limited)	0.75	~stickiness (surface) (limited)	0.75	~stickiness (surface) (limited)	0.75	~stickiness (surface) (limited)	0.75	~stickiness (surface) (limited)	0.75
					~low strength (moderately limited)	0.50	~seasonal wetness (slightly limited)	0.29	~low strength (moderately limited)	0.50
					~seasonal wetness (slightly limited)	0.29			~seasonal wetness (slightly limited)	0.29
20A:										
Portland	Limited		Limited		Limited		Limited		Very limited	
	~stickiness (surface) (limited)	0.75	~stickiness (surface) (limited)	0.75	~stickiness (surface) (limited)	0.75	~stickiness (surface) (limited)	0.75	~flooding (very limited)	1.00
					~low strength (moderately limited)	0.50	~seasonal wetness (slightly limited)	0.29	~stickiness (surface) (limited)	0.75
					~seasonal wetness (slightly limited)	0.29			~low strength (moderately limited)	0.50
21A, 21B:										
Rilla	Not limited		Not limited		Moderately limited		Not limited		Moderately limited	
					~low strength (moderately limited)	0.50			~low strength (moderately limited)	0.50
22:										
Riverwash	Not rated		Not rated		Not rated		Not rated		Not rated	
23A, 23B:										
Stuttgart	Not limited		Not limited		Moderately limited		Slightly limited		Moderately limited	
					~low strength (moderately limited)	0.50	~seasonal wetness (slightly limited)	0.29	~low strength (moderately limited)	0.50
					~seasonal wetness (slightly limited)	0.29			~seasonal wetness (slightly limited)	0.29
24A:										
Tichnor	Moderately limited		Moderately limited		Limited		Limited		Very limited	
	~seasonal wetness (moderately limited)	0.60	~seasonal wetness (moderately limited)	0.60	~seasonal wetness (limited)	0.91	~seasonal wetness (limited)	0.91	~flooding (very limited)	1.00
					~low strength (moderately limited)	0.50			~seasonal wetness (limited)	0.91
									~low strength (moderately limited)	0.50

Table 7a.--Forest Management--Continued

Map symbol and soil name	Hand planting: Rating class and limiting features	Hand planting: Value	Mechanical planting: Rating class and limiting features	Mechanical planting: Value	Use of harvesting equipment: Rating class and limiting features	Use of harvesting equipment: Value	Mechanical site preparation (surface): Rating class and limiting features	Mechanical site preparation (surface): Value	Roads (natural surface): Rating class and limiting features	Roads (natural surface): Value
25A:										
Tichnor--------	Limited		Limited		Limited		Limited		Very limited	
	~seasonally ponded (limited)	0.80	~seasonally ponded (limited)	0.80	~seasonal wetness (limited)	0.91	~seasonal wetness (limited)	0.91	~ponded (wetness) (very limited)	1.00
	~seasonal wetness (moderately limited)	0.60	~seasonal wetness (moderately limited)	0.60	~seasonally ponded (limited)	0.80	~seasonally ponded (limited)	0.80	~flooding (very limited)	1.00
					~low strength (moderately limited)	0.50			~seasonal wetness (limited)	0.91
26C:										
Udipsamments---	Not limited		Not limited		Not limited		Not limited		Not Limited	
27:										
Water----------	Not rated		Not rated		Not rated		Not rated		Not rated	
28B:										
Yancopin-------	Not limited		Not limited		Moderately limited		Not limited		Very limited	
					~low strength (moderately limited)	0.50			~flooding (very limited)	1.00
									~low strength (moderately limited)	0.50
29A:										
Yorktown-------	Limited		Limited		Limited		Limited		Very limited	
	~seasonally ponded (limited)	0.80	~seasonally ponded (limited)	0.80	~seasonal wetness (limited)	0.91	~seasonal wetness (limited)	0.91	~ponded (wetness) (very limited)	1.00
	~stickiness (surface) (limited)	0.75	~stickiness (surface) (limited)	0.75	~seasonally ponded (limited)	0.80	~seasonally ponded (limited)	0.80	~flooding (very limited)	1.00
	~seasonal wetness (moderately limited)	0.60	~seasonal wetness (moderately limited)	0.60	~stickiness (surface) (limited)	0.75	~stickiness (surface) (limited)	0.75	~seasonal wetness (limited)	0.91
DAM:										
Dam------------	Not rated		Not rated		Not rated		Not rated		Not rated	
LVS:										
Levee----------	Not rated		Not rated		Not rated		Not rated		Not rated	

Table 7b.--Forest Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Erosion on roads and trails		Off-road or off-trail erosion		Soil rutting		Log landings		Seedling survival	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1C:										
Crevasse	Not limited		Slightly limited		Moderately limited		Moderately limited		Very limited	
			~slope/erodibility (slightly limited)	0.05	~low strength (moderately limited)	0.50	~flooding (moderately limited)	0.60	~droughty (very limited)	1.00
									~flooding (moderately limited)	0.60
2B:										
Desha	Slightly limited		Slightly limited		Limited		Limited		Limited	
	~slope/erodibility (slightly limited)	0.17	~slope/erodibility (slightly limited)	0.04	~low strength (limited)	0.80	~seasonal wetness (limited)	0.76	~seasonal wetness (limited)	0.76
					~seasonal wetness (limited)	0.76	~stickiness (surface) (limited)	0.75	~flooding (moderately limited)	0.60
							~flooding (moderately limited)	0.60		
3A:										
Dewitt	Slightly limited		Slightly limited		Limited		Limited		Limited	
	~slope/erodibility (slightly limited)	0.06	~slope/erodibility (slightly limited)	0.01	~low strength (limited)	0.80	~seasonal wetness (limited)	0.62	~seasonal wetness (limited)	0.62
					~seasonal wetness (limited)	0.62	~low strength (moderately limited)	0.50		
4B:										
Dubbs	Slightly limited		Slightly limited		Limited		Moderately limited		Not limited	
	~slope/erodibility (slightly limited)	0.17	~slope/erodibility (slightly limited)	0.04	~low strength (limited)	0.80	~low strength (moderately limited)	0.50		
5B:										
Dundee	Slightly limited		Slightly limited		Limited		Moderately limited		Moderately limited	
	~slope/erodibility (slightly limited)	0.11	~slope/erodibility (slightly limited)	0.02	~low strength (limited)	0.80	~flooding (moderately limited)	0.60	~flooding (moderately limited)	0.60
					~seasonal wetness (slightly limited)	0.10	~low strength (moderately limited)	0.50		
							~seasonal wetness (slightly limited)	0.10		

Table 7b.--Forest Management--Continued

Map symbol and soil name	Erosion on roads and trails: Rating class and limiting features	Value	Off-road or off-trail erosion: Rating class and limiting features	Value	Soil rutting: Rating class and limiting features	Value	Log landings: Rating class and limiting features	Value	Seedling survival: Rating class and limiting features	Value
6A:										
Ethel----------	Slightly limited ~slope/erodibility (slightly limited)	 0.06	Slightly limited ~slope/erodibility (slightly limited)	 0.01	Limited ~low strength (limited) ~seasonal wetness (limited)	 0.80 0.62	Limited ~seasonal wetness (limited) ~low strength (moderately limited)	 0.62 0.50	Limited ~seasonal wetness (limited)	 0.62
7A:										
Forestdale-----	Slightly limited ~slope/erodibility (slightly limited)	 0.06	Slightly limited ~slope/erodibility (slightly limited)	 0.01	Limited ~low strength (limited) ~seasonal wetness (moderately limited)	 0.80 0.45	Very limited ~flooding (very limited) ~stickiness (surface) (moderately limited) ~low strength (moderately limited)	 1.00 0.50 0.50	Limited ~flooding (limited) ~seasonal wetness (moderately limited)	 0.90 0.30
8A:										
Hebert---------	Slightly limited ~slope/erodibility (slightly limited)	 0.06	Slightly limited ~slope/erodibility (slightly limited)	 0.01	Limited ~low strength (limited) ~seasonal wetness (slightly limited)	 0.80 0.15	Moderately limited ~low strength (moderately limited) ~seasonal wetness (slightly limited)	 0.50 0.15	Not limited	
9A:										
Immanuel-------	Slightly limited ~slope/erodibility (slightly limited)	 0.06	Slightly limited ~slope/erodibility (slightly limited)	 0.01	Limited ~low strength (limited) ~seasonal wetness (slightly limited)	 0.80 0.20	Moderately limited ~low strength (moderately limited) ~seasonal wetness (slightly limited)	 0.50 0.20	Not limited	
9B:										
Immanuel-------	Slightly limited ~slope/erodibility (slightly limited)	 0.22	Slightly limited ~slope/erodibility (slightly limited)	 0.05	Limited ~low strength (limited) ~seasonal wetness (slightly limited)	 0.80 0.20	Moderately limited ~low strength (moderately limited) ~seasonal wetness (slightly limited)	 0.50 0.20	Not limited	
9C:										
Immanuel-------	Limited ~slope/erodibility (limited) ~slope/erodibility (moderately limited)	 0.61 0.50	Slightly limited ~slope/erodibility (slightly limited)	 0.13	Limited ~low strength (limited) ~seasonal wetness (slightly limited)	 0.80 0.20	Moderately limited ~low strength (moderately limited) ~seasonal wetness (slightly limited)	 0.50 0.20	Not limited	

Table 7b.--Forest Management--Continued

Map symbol and soil name	Erosion on roads and trails: Rating class and limiting features	Value	Off-road or off-trail erosion: Rating class and limiting features	Value	Soil rutting: Rating class and limiting features	Value	Log landings: Rating class and limiting features	Value	Seedling survival: Rating class and limiting features	Value
9D:										
Immanuel-------	Very limited		Slightly limited		Limited		Limited		Not limited	
	~slope/erodibility (very limited)	1.00	~slope/erodibility (slightly limited)	0.28	~low strength (limited)	0.80	~slope (limited)	0.72		
	~slope/erodibility (moderately limited)	0.50			~seasonal wetness (slightly limited)	0.20	~low strength (moderately limited)	0.50		
							~seasonal wetness (slightly limited)	0.20		
9E:										
Immanuel-------	Very limited		Moderately limited		Limited		Very limited		Not limited	
	~slope/erodibility (very limited)	1.00	~slope/erodibility (moderately limited)	0.49	~low strength (limited)	0.80	~slope (very limited)	1.00		
	~slope/erodibility (limited)	0.95			~seasonal wetness (slightly limited)	0.20	~low strength (moderately limited)	0.50		
							~seasonal wetness (slightly limited)	0.20		
10A:										
Keo------------	Slightly limited		Slightly limited		Limited		Moderately limited		Moderately limited	
	~slope/erodibility (slightly limited)	0.06	~slope/erodibility (slightly limited)	0.01	~low strength (limited)	0.80	~flooding (moderately limited)	0.60	~flooding (moderately limited)	0.60
							~low strength (moderately limited)	0.50		
10C:										
Keo------------	Moderately limited		Slightly limited		Limited		Moderately limited		Moderately limited	
	~slope/erodibility (moderately limited)	0.39	~slope/erodibility (slightly limited)	0.09	~low strength (limited)	0.80	~flooding (moderately limited)	0.60	~flooding (moderately limited)	0.60
							~low strength (moderately limited)	0.50		
11A:										
Kobel----------	Slightly limited		Slightly limited		Limited		Very limited		Limited	
	~slope/erodibility (slightly limited)	0.06	~slope/erodibility (slightly limited)	0.01	~seasonal wetness (limited)	0.91	~flooding (very limited)	1.00	~seasonal wetness (limited)	0.91
					~low strength (limited)	0.80	~seasonal wetness (limited)	0.91	~flooding (limited)	0.90
							~stickiness (surface) (limited)	0.75		

Table 7b.--Forest Management--Continued

Map symbol and soil name	Erosion on roads and trails: Rating class and limiting features	Value	Off-road or off-trail erosion: Rating class and limiting features	Value	Soil rutting: Rating class and limiting features	Value	Log landings: Rating class and limiting features	Value	Seedling survival: Rating class and limiting features	Value
12A: Kobel----------	Slightly limited ~slope/erodibility (slightly limited)	 0.06	Slightly limited ~slope/erodibility (slightly limited)	 0.01	Limited ~seasonal wetness (limited) ~low strength (limited)	 0.91 0.80	Very limited ~flooding (very limited) ~seasonal wetness (limited) ~seasonally ponded (limited)	 1.00 0.91 0.80	Limited ~seasonal wetness (limited) ~flooding (limited)	 0.91 0.90
13A: Lagrue---------	Not limited		Slightly limited ~slope/erodibility (slightly limited)	 0.01	Limited ~seasonal wetness (limited) ~low strength (limited)	 0.91 0.80	Limited ~seasonal wetness (limited) ~stickiness (surface) (moderately limited) ~low strength (moderately limited)	 0.91 0.50 0.50	Limited ~seasonal wetness (limited)	 0.91
14B: Muskogee-------	Slightly limited ~slope/erodibility (slightly limited)	 0.22	Slightly limited ~slope/erodibility (slightly limited)	 0.05	Limited ~low strength (limited) ~seasonal wetness (slightly limited)	 0.80 0.29	Moderately limited ~low strength (moderately limited) ~seasonal wetness (slightly limited)	 0.50 0.29	Not limited	
14C: Muskogee-------	Limited ~slope/erodibility (limited) ~slope/erodibility (moderately limited)	 0.61 0.50	Slightly limited ~slope/erodibility (slightly limited)	 0.13	Limited ~low strength (limited) ~seasonal wetness (slightly limited)	 0.80 0.29	Moderately limited ~low strength (moderately limited) ~seasonal wetness (slightly limited)	 0.50 0.29	Not limited	
14D: Muskogee-------	Very limited ~slope/erodibility (very limited) ~slope/erodibility (moderately limited)	 1.00 0.50	Slightly limited ~slope/erodibility (slightly limited)	 0.28	Limited ~low strength (limited) ~seasonal wetness (slightly limited)	 0.80 0.29	Limited ~slope (limited) ~low strength (moderately limited) ~seasonal wetness (slightly limited)	 0.72 0.50 0.29	Not limited	

Table 7b.--Forest Management--Continued

Map symbol and soil name	Erosion on roads and trails: Rating class and limiting features	Erosion on roads and trails: Value	Off-road or off-trail erosion: Rating class and limiting features	Off-road or off-trail erosion: Value	Soil rutting: Rating class and limiting features	Soil rutting: Value	Log landings: Rating class and limiting features	Log landings: Value	Seedling survival: Rating class and limiting features	Seedling survival: Value
15A: Oaklimeter-----	Slightly limited ~slope/erodibility (slightly limited)	 0.06	Slightly limited ~slope/erodibility (slightly limited)	 0.01	Limited ~low strength (limited) ~seasonal wetness (slightly limited)	 0.80 0.20	Moderately limited ~flooding (moderately limited) ~low strength (moderately limited) ~seasonal wetness (slightly limited)	 0.60 0.50 0.20	Moderately limited ~flooding (moderately limited)	 0.60
16A: Overcup--------	Slightly limited ~slope/erodibility (slightly limited)	 0.06	Slightly limited ~slope/erodibility (slightly limited)	 0.01	Limited ~seasonal wetness (limited) ~low strength (limited)	 0.91 0.80	Limited ~seasonal wetness (limited) ~low strength (moderately limited)	 0.91 0.50	Limited ~seasonal wetness (limited)	 0.91
17A: Perry----------	Slightly limited ~slope/erodibility (slightly limited)	 0.06	Slightly limited ~slope/erodibility (slightly limited)	 0.01	Limited ~low strength (limited) ~seasonal wetness (limited)	 0.80 0.62	Limited ~stickiness (surface) (limited) ~seasonal wetness (limited) ~low strength (moderately limited)	 0.75 0.62 0.50	Limited ~seasonal wetness (limited)	 0.62
18A: Perry----------	Slightly limited ~slope/erodibility (slightly limited)	 0.06	Slightly limited ~slope/erodibility (slightly limited)	 0.01	Limited ~low strength (limited) ~seasonal wetness (limited)	 0.80 0.62	Very limited ~flooding (very limited) ~stickiness (surface) (limited) ~seasonal wetness (limited)	 1.00 0.75 0.62	Limited ~flooding (limited) ~seasonal wetness (limited)	 0.90 0.62
19A: Portland-------	Slightly limited ~slope/erodibility (slightly limited)	 0.06	Slightly limited ~slope/erodibility (slightly limited)	 0.01	Limited ~low strength (limited) ~seasonal wetness (slightly limited)	 0.80 0.29	Limited ~stickiness (surface) (limited) ~low strength (moderately limited) ~seasonal wetness (slightly limited)	 0.75 0.50 0.29	Not limited	

Table 7b.--Forest Management--Continued

Map symbol and soil name	Erosion on roads and trails: Rating class and limiting features	Value	Off-road or off-trail erosion: Rating class and limiting features	Value	Soil rutting: Rating class and limiting features	Value	Log landings: Rating class and limiting features	Value	Seedling survival: Rating class and limiting features	Value
20A:										
Portland	Slightly limited		Slightly limited		Limited		Very limited		Limited	
	~slope/erodibility (slightly limited)	0.06	~slope/erodibility (slightly limited)	0.01	~low strength (limited)	0.80	~flooding (very limited)	1.00	~flooding (limited)	0.90
					~seasonal wetness (slightly limited)	0.29	~stickiness (surface) (limited)	0.75		
							~low strength (moderately limited)	0.50		
21A:										
Rilla	Slightly limited		Slightly limited		Limited		Moderately limited		Not limited	
	~slope/erodibility (slightly limited)	0.06	~slope/erodibility (slightly limited)	0.01	~low strength (limited)	0.80	~low strength (moderately limited)	0.50		
21B:										
Rilla	Slightly limited		Slightly limited		Limited		Moderately limited		Not limited	
	~slope/erodibility (slightly limited)	0.22	~slope/erodibility (slightly limited)	0.05	~low strength (limited)	0.80	~low strength (moderately limited)	0.50		
22:										
Riverwash	Not rated		Not rated		Not rated		Not rated		Not rated	
23A:										
Stuttgart	Slightly limited		Slightly limited		Limited		Moderately limited		Not limited	
	~slope/erodibility (slightly limited)	0.06	~slope/erodibility (slightly limited)	0.01	~low strength (limited)	0.80	~low strength (moderately limited)	0.50		
					~seasonal wetness (slightly limited)	0.29	~seasonal wetness (slightly limited)	0.29		
23B:										
Stuttgart	Slightly limited		Slightly limited		Limited		Moderately limited		Not limited	
	~slope/erodibility (slightly limited)	0.22	~slope/erodibility (slightly limited)	0.05	~low strength (limited)	0.80	~low strength (moderately limited)	0.50		
					~seasonal wetness (slightly limited)	0.29	~seasonal wetness (slightly limited)	0.29		
24A:										
Tichnor	Slightly limited		Slightly limited		Limited		Very limited		Limited	
	~slope/erodibility (slightly limited)	0.06	~slope/erodibility (slightly limited)	0.01	~seasonal wetness (limited)	0.91	~flooding (very limited)	1.00	~seasonal wetness (limited)	0.91
					~low strength (limited)	0.80	~seasonal wetness (limited)	0.91	~flooding (limited)	0.90
							~low strength (moderately limited)	0.50		

Table 7b.--Forest Management--Continued

Map symbol and soil name	Erosion on roads and trails: Rating class and limiting features	Value	Off-road or off-trail erosion: Rating class and limiting features	Value	Soil rutting: Rating class and limiting features	Value	Log landings: Rating class and limiting features	Value	Seedling survival: Rating class and limiting features	Value
25A:										
Tichnor	Slightly limited		Slightly limited		Limited		Very limited		Limited	
	~slope/erodibility (slightly limited)	0.06	~slope/erodibility (slightly limited)	0.01	~seasonal wetness (limited)	0.91	~flooding (very limited)	1.00	~seasonal wetness (limited)	0.91
					~low strength (limited)	0.80	~seasonal wetness (limited)	0.91	~flooding (limited)	0.90
							~seasonally ponded (limited)	0.80		
26C:										
Udipsamments	Not limited		Slightly limited		Moderately limited		Not limited		Very limited	
			~slope/erodibility (slightly limited)	0.06	~low strength (moderately limited)	0.50			~droughty (very limited)	1.00
27:										
Water	Not rated		Not rated		Not rated		Not rated		Not rated	
28B:										
Yancopin	Slightly limited		Slightly limited		Limited		Very limited		Limited	
	~slope/erodibility (slightly limited)	0.22	~slope/erodibility (slightly limited)	0.05	~low strength (limited)	0.80	~flooding (very limited)	1.00	~flooding (limited)	0.90
							~low strength (moderately limited)	0.50		
29A:										
Yorktown	Slightly limited		Slightly limited		Limited		Very limited		Limited	
	~slope/erodibility (slightly limited)	0.06	~slope/erodibility (slightly limited)	0.01	~seasonal wetness (limited)	0.91	~flooding (very limited)	1.00	~seasonal wetness (limited)	0.91
					~low strength (limited)	0.80	~seasonal wetness (limited)	0.91	~flooding (limited)	0.90
							~seasonally ponded (limited)	0.80		
DAM:										
Dam	Not rated		Not rated		Not rated		Not rated		Not rated	
LVS:										
Levee	Not rated		Not rated		Not rated		Not rated		Not rated	

Table 8.--Recreation

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value	Paths and trails: Rating class and limiting features	Value
1C:								
Crevasse-------	Very limited		Moderately limited		Moderately limited		Moderately limited	
	~flooding (very limited)	1.00	~too sandy (moderately limited)	0.50	~flooding (moderately limited)	0.60	~too sandy (moderately limited)	0.50
	~too sandy (moderately limited)	0.50			~too sandy (moderately limited)	0.50		
					~slope (slightly limited)	0.02		
2B:								
Desha----------	Very limited		Very limited		Very limited		Very limited	
	~too clayey (very limited)	1.00	~too clayey (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
	~flooding (very limited)	1.00	~wetness (very limited)	1.00	~too clayey (very limited)	1.00	~too clayey (very limited)	1.00
	~wetness (very limited)	1.00	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00		
3A:								
Dewitt---------	Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
	~percs slowly (moderately limited)	0.39	~percs slowly (moderately limited)	0.39	~percs slowly (moderately limited)	0.39		
4B:								
Dubbs----------	Not limited		Not limited		Not limited		Not limited	
5B:								
Dundee---------	Very limited		Slightly limited		Moderately limited		Not limited	
	~flooding (very limited)	1.00	~percs slowly (slightly limited)	0.17	~flooding (moderately limited)	0.60		
	~percs slowly (slightly limited)	0.17			~percs slowly (slightly limited)	0.17		
6A:								
Ethel----------	Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
	~percs slowly (slightly limited)	0.17	~percs slowly (slightly limited)	0.17	~percs slowly (slightly limited)	0.17		

Table 8.--Recreation--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value	Paths and trails: Rating class and limiting features	Value
7A:								
Forestdale-----	Very limited		Very limited		Very limited		Limited	
	~flooding (very limited)	1.00	~percs slowly (very limited)	1.00	~flooding (very limited)	1.00	~wetness (limited)	0.81
	~wetness (very limited)	1.00	~wetness (limited)	0.81	~wetness (very limited)	1.00	~flooding (moderately limited)	0.60
	~percs slowly (very limited)	1.00	~flooding (moderately limited)	0.60	~percs slowly (very limited)	1.00	~too clayey (moderately limited)	0.60
8A:								
Hebert---------	Moderately limited		Slightly limited		Moderately limited		Slightly limited	
	~wetness (moderately limited)	0.35	~percs slowly (slightly limited)	0.17	~wetness (moderately limited)	0.35	~wetness (slightly limited)	0.13
	~percs slowly (slightly limited)	0.17	~wetness (slightly limited)	0.13	~percs slowly (slightly limited)	0.17		
9A, 9B:								
Immanuel-------	Moderately limited		Slightly limited		Moderately limited		Slightly limited	
	~wetness (moderately limited)	0.50	~wetness (slightly limited)	0.28	~wetness (moderately limited)	0.50	~wetness (slightly limited)	0.28
	~percs slowly (slightly limited)	0.17	~percs slowly (slightly limited)	0.17	~percs slowly (slightly limited)	0.17		
9C:								
Immanuel-------	Moderately limited		Slightly limited		Limited		Slightly limited	
	~wetness (moderately limited)	0.50	~wetness (slightly limited)	0.28	~slope (limited)	0.90	~wetness (slightly limited)	0.28
	~percs slowly (slightly limited)	0.17	~percs slowly (slightly limited)	0.17	~wetness (moderately limited)	0.50		
					~percs slowly (slightly limited)	0.17		
9D:								
Immanuel-------	Moderately limited		Moderately limited		Very limited		Very limited	
	~slope (moderately limited)	0.50	~slope (moderately limited)	0.50	~slope (very limited)	1.00	~erodes easily (very limited)	1.00
	~wetness (moderately limited)	0.50	~wetness (slightly limited)	0.28	~wetness (moderately limited)	0.50	~wetness (slightly limited)	0.28
	~percs slowly (slightly limited)	0.17	~percs slowly (slightly limited)	0.17	~percs slowly (slightly limited)	0.17		

Table 8.--Recreation--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value	Paths and trails: Rating class and limiting features	Value
9E:								
Immanuel-------	Very limited		Very limited		Very limited		Very limited	
	~slope (very limited)	1.00	~slope (very limited)	1.00	~slope (very limited)	1.00	~erodes easily (very limited)	1.00
	~wetness (moderately limited)	0.50	~wetness (slightly limited)	0.28	~wetness (moderately limited)	0.50	~slope (moderately limited)	0.50
	~percs slowly (slightly limited)	0.17	~percs slowly (slightly limited)	0.17	~percs slowly (slightly limited)	0.17	~wetness (slightly limited)	0.28
10A:								
Keo------------	Very limited		Not limited		Moderately limited		Not limited	
	~flooding (very limited)	1.00			~flooding (moderately limited)	0.60		
10C:								
Keo------------	Very limited		Not limited		Moderately limited		Not limited	
	~flooding (very limited)	1.00			~flooding (moderately limited)	0.60		
					~slope (slightly limited)	0.22		
11A:								
Kobel----------	Very limited		Very limited		Very limited		Very limited	
	~too clayey (very limited)	1.00	~too clayey (very limited)	1.00	~flooding (very limited)	1.00	~wetness (very limited)	1.00
	~flooding (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~too clayey (very limited)	1.00
	~wetness (very limited)	1.00	~percs slowly (very limited)	1.00	~too clayey (very limited)	1.00	~flooding (moderately limited)	0.60
12A:								
Kobel----------	Very limited		Very limited		Very limited		Very limited	
	~too clayey (very limited)	1.00	~too clayey (very limited)	1.00	~flooding (very limited)	1.00	~ponded (wetness) (very limited)	1.00
	~ponded (wetness) (very limited)	1.00	~ponded (wetness) (very limited)	1.00	~ponded (wetness) (very limited)	1.00	~wetness (very limited)	1.00
	~flooding (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~too clayey (very limited)	1.00
13A:								
Lagrue---------	Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~too clayey (moderately limited)	0.60
	~too clayey (moderately limited)	0.60	~too clayey (moderately limited)	0.60	~too clayey (moderately limited)	0.60		

Table 8.--Recreation--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value	Paths and trails: Rating class and limiting features	Value
14B: Muskogee	Limited		Limited		Limited		Limited	
	~wetness (limited)	0.96	~wetness (limited)	0.60	~wetness (limited)	0.96	~wetness (limited)	0.60
	~percs slowly (moderately limited)	0.39	~percs slowly (moderately limited)	0.39	~percs slowly (moderately limited)	0.39		
14C: Muskogee	Limited		Limited		Limited		Limited	
	~wetness (limited)	0.96	~wetness (limited)	0.60	~wetness (limited)	0.96	~wetness (limited)	0.60
	~percs slowly (moderately limited)	0.39	~percs slowly (moderately limited)	0.39	~slope (limited)	0.90		
					~percs slowly (moderately limited)	0.39		
14D: Muskogee	Limited		Limited		Very limited		Very limited	
	~wetness (limited)	0.96	~wetness (limited)	0.60	~slope (very limited)	1.00	~erodes easily (very limited)	1.00
	~slope (moderately limited)	0.50	~slope (moderately limited)	0.50	~wetness (limited)	0.96	~wetness (limited)	0.60
	~percs slowly (moderately limited)	0.39	~percs slowly (moderately limited)	0.39	~percs slowly (moderately limited)	0.39		
15A: Oaklimeter	Very limited		Slightly limited		Moderately limited		Slightly limited	
	~flooding (very limited)	1.00	~wetness (slightly limited)	0.28	~flooding (moderately limited)	0.60	~wetness (slightly limited)	0.28
	~wetness (moderately limited)	0.50			~wetness (moderately limited)	0.50		
16A: Overcup	Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00		
17A: Perry	Very limited		Very limited		Very limited		Very limited	
	~too clayey (very limited)	1.00	~too clayey (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~too clayey (very limited)	1.00	~too clayey (very limited)	1.00
	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00		

Table 8.--Recreation--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value	Paths and trails: Rating class and limiting features	Paths and trails: Value
18A:								
Perry----------	Very limited		Very limited		Very limited		Very limited	
	~too clayey (very limited)	1.00	~too clayey (very limited)	1.00	~flooding (very limited)	1.00	~wetness (very limited)	1.00
	~flooding (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~too clayey (very limited)	1.00
	~wetness (very limited)	1.00	~percs slowly (very limited)	1.00	~too clayey (very limited)	1.00	~flooding (moderately limited)	0.60
19A:								
Portland-------	Very limited		Very limited		Very limited		Very limited	
	~too clayey (very limited)	1.00	~too clayey (very limited)	1.00	~too clayey (very limited)	1.00	~too clayey (very limited)	1.00
	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~wetness (limited)	0.60
	~wetness (limited)	0.96	~wetness (limited)	0.60	~wetness (limited)	0.96		
20A:								
Portland-------	Very limited		Very limited		Very limited		Very limited	
	~too clayey (very limited)	1.00	~too clayey (very limited)	1.00	~flooding (very limited)	1.00	~too clayey (very limited)	1.00
	~flooding (very limited)	1.00	~percs slowly (very limited)	1.00	~too clayey (very limited)	1.00	~wetness (limited)	0.60
	~percs slowly (very limited)	1.00	~wetness (limited)	0.60	~percs slowly (very limited)	1.00	~flooding (moderately limited)	0.60
21A, 21B:								
Rilla----------	Not limited		Not limited		Not limited		Not limited	
22:								
Riverwash------	Not rated		Not rated		Not rated		Not rated	
23A, 23B:								
Stuttgart------	Very limited		Very limited		Very limited		Limited	
	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~wetness (limited)	0.60
	~wetness (limited)	0.96	~wetness (limited)	0.60	~wetness (limited)	0.96		
24A:								
Tichnor--------	Very limited		Very limited		Very limited		Very limited	
	~flooding (very limited)	1.00	~wetness (very limited)	1.00	~flooding (very limited)	1.00	~wetness (very limited)	1.00
	~wetness (very limited)	1.00	~flooding (moderately limited)	0.60	~wetness (very limited)	1.00	~flooding (moderately limited)	0.60
	~percs slowly (slightly limited)	0.17	~percs slowly (slightly limited)	0.17	~percs slowly (slightly limited)	0.17		

Table 8.--Recreation--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value	Paths and trails: Rating class and limiting features	Value
25A:								
Tichnor	Very limited		Very limited		Very limited		Very limited	
	~ponded (wetness) (very limited)	1.00	~ponded (wetness) (very limited)	1.00	~flooding (very limited)	1.00	~ponded (wetness) (very limited)	1.00
	~flooding (very limited)	1.00	~wetness (very limited)	1.00	~ponded (wetness) (very limited)	1.00	~wetness (very limited)	1.00
	~wetness (very limited)	1.00	~flooding (moderately limited)	0.60	~wetness (very limited)	1.00	~flooding (moderately limited)	0.60
26C:								
Udipsamments	Moderately limited		Moderately limited		Moderately limited		Moderately limited	
	~too sandy (moderately limited)	0.50	~too sandy (moderately limited)	0.50	~too sandy (moderately limited)	0.50	~too sandy (moderately limited)	0.50
					~slope (slightly limited)	0.10		
27:								
Water	Not rated		Not rated		Not rated		Not rated	
28B:								
Yancopin	Very limited		Moderately limited		Very limited		Moderately limited	
	~flooding (very limited)	1.00	~flooding (moderately limited)	0.60	~flooding (very limited)	1.00	~flooding (moderately limited)	0.60
	~too clayey (moderately limited)	0.60	~too clayey (moderately limited)	0.60	~too clayey (moderately limited)	0.60	~too clayey (moderately limited)	0.60
	~percs slowly (slightly limited)	0.17	~percs slowly (slightly limited)	0.17	~percs slowly (slightly limited)	0.17		
29A:								
Yorktown	Very limited		Very limited		Very limited		Very limited	
	~too clayey (very limited)	1.00	~too clayey (very limited)	1.00	~flooding (very limited)	1.00	~ponded (wetness) (very limited)	1.00
	~ponded (wetness) (very limited)	1.00	~ponded (wetness) (very limited)	1.00	~ponded (wetness) (very limited)	1.00	~wetness (very limited)	1.00
	~flooding (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~too clayey (very limited)	1.00
DAM:								
Dam	Not rated		Not rated		Not rated		Not rated	
LVS:								
Levee	Not rated		Not rated		Not rated		Not rated	

Table 9a.--Wildlife Habitat

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Grain and seed crops (for use as food and cover)		Domestic grasses and legumes (for use as food and cover)		Upland wild herbaceous plants		Upland shrubs and vines		Upland deciduous trees	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1C:										
Crevasse	Very limited		Very limited		Very limited		Very limited		Very limited	
	~droughty (very limited)	1.00	~droughty (very limited)	1.00	~droughty (very limited)	1.00	~droughty (very limited)	1.00	~droughty (very limited)	1.00
	~flooding (moderately limited)	0.60	~flooding (moderately limited)	0.60	~too sandy (moderately limited)	0.50	~too sandy (moderately limited)	0.50		
	~too sandy (moderately limited)	0.50	~too sandy (moderately limited)	0.50						
2B:										
Desha	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~too clayey (limited)	0.61	~too clayey (limited)	0.61		
	~too clayey (limited)	0.61	~too clayey (limited)	0.61						
3A:										
Dewitt	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
	~percs slowly (moderately limited)	0.39	~percs slowly (moderately limited)	0.39						
4B:										
Dubbs	Moderately limited		Moderately limited		Not limited		Not limited		Not limited	
	~moderate erodibility (moderately limited)	0.50	~moderate erodibility (moderately limited)	0.50						
5B:										
Dundee	Moderately limited		Moderately limited		Slightly limited		Slightly limited		Moderately limited	
	~flooding (moderately limited)	0.60	~flooding (moderately limited)	0.60	~wetness (slightly limited)	0.28	~wetness (slightly limited)	0.28	~wetness (moderately limited)	0.45
	~wetness (slightly limited)	0.28	~wetness (slightly limited)	0.28						
	~percs slowly (slightly limited)	0.17	~percs slowly (slightly limited)	0.17						

Table 9a.--Wildlife Habitat--Continued

Map symbol and soil name	Grain and seed crops (for use as food and cover): Rating class and limiting features	Value	Domestic grasses and legumes (for use as food and cover): Rating class and limiting features	Value	Upland wild herbaceous plants: Rating class and limiting features	Value	Upland shrubs and vines: Rating class and limiting features	Value	Upland deciduous trees: Rating class and limiting features	Value
6A:										
Ethel	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
	~percs slowly (slightly limited)	0.17	~percs slowly (slightly limited)	0.17						
7A:										
Forestdale	Very limited		Very limited		Limited		Limited		Very limited	
	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~wetness (limited)	0.81	~wetness (limited)	0.81	~wetness (very limited)	1.00
	~flooding (limited)	0.90	~flooding (limited)	0.90	~flooding (prolonged) (slightly limited)	0.20	~flooding (prolonged) (slightly limited)	0.20	~flooding (prolonged) (slightly limited)	0.20
	~wetness (limited)	0.81	~wetness (limited)	0.81	~too clayey (slightly limited)	0.10	~too clayey (slightly limited)	0.10		
8A:										
Hebert	Moderately limited		Moderately limited		Moderately limited		Moderately limited		Moderately limited	
	~wetness (moderately limited)	0.36	~wetness (moderately limited)	0.36	~wetness (moderately limited)	0.36	~wetness (moderately limited)	0.36	~wetness (moderately limited)	0.51
	~percs slowly (slightly limited)	0.17	~percs slowly (slightly limited)	0.17						
9A:										
Immanuel	Moderately limited		Moderately limited		Moderately limited		Moderately limited		Moderately limited	
	~wetness (moderately limited)	0.44	~wetness (moderately limited)	0.44	~wetness (moderately limited)	0.44	~wetness (moderately limited)	0.44	~wetness (moderately limited)	0.59
	~percs slowly (slightly limited)	0.17	~percs slowly (slightly limited)	0.17						
9B:										
Immanuel	Moderately limited		Moderately limited		Moderately limited		Moderately limited		Moderately limited	
	~moderate erodibility (moderately limited)	0.50	~moderate erodibility (moderately limited)	0.50	~wetness (moderately limited)	0.44	~wetness (moderately limited)	0.44	~wetness (moderately limited)	0.59
	~wetness (moderately limited)	0.44	~wetness (moderately limited)	0.44						
	~percs slowly (slightly limited)	0.17	~percs slowly (slightly limited)	0.17						

Table 9a.--Wildlife Habitat--Continued

Map symbol and soil name	Grain and seed crops (for use as food and cover): Rating class and limiting features	Value	Domestic grasses and legumes (for use as food and cover): Rating class and limiting features	Value	Upland wild herbaceous plants: Rating class and limiting features	Value	Upland shrubs and vines: Rating class and limiting features	Value	Upland deciduous trees: Rating class and limiting features	Value
9C, 9D:										
Immanuel-------	Limited		Limited		Moderately limited		Moderately limited		Moderately limited	
	~high erodibility (limited)	0.80	~high erodibility (limited)	0.80	~wetness (moderately limited)	0.44	~wetness (moderately limited)	0.44	~wetness (moderately limited)	0.59
	~wetness (moderately limited)	0.44	~wetness (moderately limited)	0.44						
	~percs slowly (slightly limited)	0.17	~percs slowly (slightly limited)	0.17						
9E:										
Immanuel-------	Limited		Limited		Moderately limited		Moderately limited		Moderately limited	
	~high erodibility (limited)	0.80	~high erodibility (limited)	0.80	~wetness (moderately limited)	0.44	~wetness (moderately limited)	0.44	~wetness (moderately limited)	0.59
	~wetness (moderately limited)	0.44	~wetness (moderately limited)	0.44						
	~slope (moderately limited)	0.30	~slope (moderately limited)	0.30						
10A:										
Keo------------	Moderately limited		Moderately limited		Not limited		Not limited		Not limited	
	~flooding (moderately limited)	0.60	~flooding (moderately limited)	0.60						
10C:										
Keo------------	Moderately limited		Moderately limited		Not limited		Not limited		Not limited	
	~flooding (moderately limited)	0.60	~flooding (moderately limited)	0.60						
	~moderate erodibility (moderately limited)	0.50	~moderate erodibility (moderately limited)	0.50						
11A:										
Kobel----------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~too clayey (moderately limited)	0.47	~too clayey (moderately limited)	0.47	~flooding (prolonged) (slightly limited)	0.20
	~flooding (limited)	0.90	~flooding (limited)	0.90	~flooding (prolonged) (slightly limited)	0.20	~flooding (prolonged) (slightly limited)	0.20		

Table 9a.--Wildlife Habitat--Continued

Map symbol and soil name	Grain and seed crops (for use as food and cover): Rating class and limiting features	Value	Domestic grasses and legumes (for use as food and cover): Rating class and limiting features	Value	Upland wild herbaceous plants: Rating class and limiting features	Value	Upland shrubs and vines: Rating class and limiting features	Value	Upland deciduous trees: Rating class and limiting features	Value
12A:										
Kobel----------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
	~ponded (wetness) (very limited)	1.00	~ponded (wetness) (very limited)	1.00	~seasonally ponded (limited)	0.80	~seasonally ponded (limited)	0.80	~seasonally ponded (limited)	0.80
	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~too clayey (moderately limited)	0.47	~too clayey (moderately limited)	0.47	~flooding (prolonged) (slightly limited)	0.20
13A:										
Lagrue---------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~too clayey (slightly limited)	0.12	~too clayey (slightly limited)	0.12		
	~too clayey (slightly limited)	0.12	~too clayey (slightly limited)	0.12						
14B, 14C:										
Muskogee-------	Moderately limited		Moderately limited		Moderately limited		Moderately limited		Limited	
	~wetness (moderately limited)	0.60	~wetness (moderately limited)	0.60	~wetness (moderately limited)	0.60	~wetness (moderately limited)	0.60	~wetness (limited)	0.99
	~moderate erodibility (moderately limited)	0.50	~moderate erodibility (moderately limited)	0.50						
	~percs slowly (moderately limited)	0.39	~percs slowly (moderately limited)	0.39						
14D:										
Muskogee-------	Limited		Limited		Moderately limited		Moderately limited		Limited	
	~high erodibility (limited)	0.80	~high erodibility (limited)	0.80	~wetness (moderately limited)	0.60	~wetness (moderately limited)	0.60	~wetness (limited)	0.99
	~wetness (moderately limited)	0.60	~wetness (moderately limited)	0.60						
	~percs slowly (moderately limited)	0.39	~percs slowly (moderately limited)	0.39						
15A:										
Oaklimeter-----	Moderately limited		Moderately limited		Moderately limited		Moderately limited		Moderately limited	
	~flooding (moderately limited)	0.60	~flooding (moderately limited)	0.60	~wetness (moderately limited)	0.44	~wetness (moderately limited)	0.44	~wetness (moderately limited)	0.59
	~wetness (moderately limited)	0.44	~wetness (moderately limited)	0.44						

Table 9a.--Wildlife Habitat--Continued

Map symbol and soil name	Grain and seed crops (for use as food and cover): Rating class and limiting features	Value	Domestic grasses and legumes (for use as food and cover): Rating class and limiting features	Value	Upland wild herbaceous plants: Rating class and limiting features	Value	Upland shrubs and vines: Rating class and limiting features	Value	Upland deciduous trees: Rating class and limiting features	Value
16A:										
Overcup--------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00						
17A:										
Perry----------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~too clayey (limited)	0.76	~too clayey (limited)	0.76		
	~too clayey (limited)	0.76	~too clayey (limited)	0.76						
18A:										
Perry----------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~too clayey (limited)	0.76	~too clayey (limited)	0.76	~flooding (prolonged) (slightly limited)	0.20
	~flooding (limited)	0.90	~flooding (limited)	0.90	~flooding (prolonged) (slightly limited)	0.20	~flooding (prolonged) (slightly limited)	0.20		
19A:										
Portland-------	Very limited		Very limited		Limited		Limited		Limited	
	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~too clayey (limited)	0.61	~too clayey (limited)	0.61	~wetness (limited)	0.99
	~too clayey (limited)	0.61	~too clayey (limited)	0.61	~wetness (moderately limited)	0.60	~wetness (moderately limited)	0.60		
	~wetness (moderately limited)	0.60	~wetness (moderately limited)	0.60						
20A:										
Portland-------	Very limited		Very limited		Limited		Limited		Limited	
	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~too clayey (limited)	0.61	~too clayey (limited)	0.61	~wetness (limited)	0.99
	~flooding (limited)	0.90	~flooding (limited)	0.90	~wetness (moderately limited)	0.60	~wetness (moderately limited)	0.60		
	~too clayey (limited)	0.61	~too clayey (limited)	0.61						

Table 9a.--Wildlife Habitat--Continued

Map symbol and soil name	Grain and seed crops (for use as food and cover): Rating class and limiting features	Value	Domestic grasses and legumes (for use as food and cover): Rating class and limiting features	Value	Upland wild herbaceous plants: Rating class and limiting features	Value	Upland shrubs and vines: Rating class and limiting features	Value	Upland deciduous trees: Rating class and limiting features	Value
21A:										
Rilla----------	Not limited		Not limited		Not limited		Not limited		Not limited	
21B:										
Rilla----------	Moderately limited		Moderately limited		Not limited		Not limited		Not limited	
	~moderate erodibility (moderately limited)	0.50	~moderate erodibility (moderately limited)	0.50						
22:										
Riverwash------	Not rated		Not rated		Not rated		Not rated		Not rated	
23A:										
Stuttgart------	Very limited		Very limited		Moderately limited		Moderately limited		Limited	
	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~wetness (moderately limited)	0.60	~wetness (moderately limited)	0.60	~wetness (limited)	0.99
	~wetness (moderately limited)	0.60	~wetness (moderately limited)	0.60						
23B:										
Stuttgart------	Very limited		Very limited		Moderately limited		Moderately limited		Limited	
	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~wetness (moderately limited)	0.60	~wetness (moderately limited)	0.60	~wetness (limited)	0.99
	~wetness (moderately limited)	0.60	~wetness (moderately limited)	0.60						
	~moderate erodibility (moderately limited)	0.50	~moderate erodibility (moderately limited)	0.50						
24A:										
Tichnor--------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
	~flooding (limited)	0.90	~flooding (limited)	0.90	~flooding (prolonged) (slightly limited)	0.20	~flooding (prolonged) (slightly limited)	0.20	~flooding (prolonged) (slightly limited)	0.20
	~percs slowly (slightly limited)	0.17	~percs slowly (slightly limited)	0.17						
25A:										
Tichnor--------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
	~ponded (wetness) (very limited)	1.00	~ponded (wetness) (very limited)	1.00	~flooding (prolonged) (limited)	0.90	~flooding (prolonged) (limited)	0.90	~flooding (prolonged) (limited)	0.90
	~flooding (limited)	0.90	~flooding (limited)	0.90	~seasonally ponded (limited)	0.80	~seasonally ponded (limited)	0.80	~seasonally ponded (limited)	0.80

Table 9a.--Wildlife Habitat--Continued

Map symbol and soil name	Grain and seed crops (for use as food and cover): Rating class and limiting features	Value	Domestic grasses and legumes (for use as food and cover): Rating class and limiting features	Value	Upland wild herbaceous plants: Rating class and limiting features	Value	Upland shrubs and vines: Rating class and limiting features	Value	Upland deciduous trees: Rating class and limiting features	Value
26C:										
Udipsamments---	Very limited ~droughty (very limited) ~too sandy (moderately limited)	 1.00 0.50	Very limited ~droughty (very limited) ~too sandy (moderately limited)	 1.00 0.50	Very limited ~droughty (very limited) ~too sandy (moderately limited)	 1.00 0.50	Very limited ~droughty (very limited) ~too sandy (moderately limited)	 1.00 0.50	Very limited ~droughty (very limited)	 1.00
27:										
Water----------	Not rated		Not rated		Not rated		Not rated		Not rated	
28B:										
Yancopin-------	Limited ~flooding (limited) ~percs slowly (slightly limited) ~wetness (slightly limited)	 0.90 0.17 0.13	Limited ~flooding (limited) ~percs slowly (slightly limited) ~wetness (slightly limited)	 0.90 0.17 0.13	Slightly limited ~wetness (slightly limited) ~too clayey (slightly limited)	 0.13 0.05	Slightly limited ~wetness (slightly limited) ~too clayey (slightly limited)	 0.13 0.05	Moderately limited ~wetness (moderately limited)	 0.37
29A:										
Yorktown-------	Very limited ~wetness (very limited) ~ponded (wetness) (very limited) ~percs slowly (very limited)	 1.00 1.00 1.00	Very limited ~wetness (very limited) ~ponded (wetness) (very limited) ~percs slowly (very limited)	 1.00 1.00 1.00	Very limited ~wetness (very limited) ~flooding (prolonged) (limited) ~seasonally ponded (limited)	 1.00 0.90 0.80	Very limited ~wetness (very limited) ~flooding (prolonged) (limited) ~seasonally ponded (limited)	 1.00 0.90 0.80	Very limited ~wetness (very limited) ~flooding (prolonged) (limited) ~seasonally ponded (limited)	 1.00 0.90 0.80
DAM:										
Dam------------	Not rated		Not rated		Not rated		Not rated		Not rated	
LVS:										
Levee----------	Not rated		Not rated		Not rated		Not rated		Not rated	

Table 9b.--Wildlife Habitat

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Upland mixed deciduous-conifer trees		Riparian herbaceous plants		Riparian shrubs, vines, and trees		Freshwater wetland plants		Irrigated freshwater wetland plants	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1C: Crevasse-------	Very limited ~droughty (very limited)	 1.00	Moderately limited ~too sandy (moderately limited) ~infrequent flooding (moderately limited)	 0.50 0.50	Very limited ~droughty (very limited)	 1.00	Moderately limited ~too sandy (moderately limited)	 0.50	Very limited ~seepage (very limited) ~too sandy (moderately limited) ~slope (slightly limited)	 1.00 0.50 0.02
2B: Desha----------	Very limited ~wetness (very limited)	 1.00	Moderately limited ~infrequent flooding (moderately limited)	 0.50	Not limited		Not limited		Not limited	
3A: Dewitt---------	Very limited ~wetness (very limited)	 1.00	Limited ~infrequent flooding (limited)	 0.80	Not limited		Not limited		Not limited	
4B: Dubbs----------	Not limited		Limited ~infrequent flooding (limited)	 0.80	Not limited		Not limited		Moderately limited ~seepage (moderately limited)	 0.45
5B: Dundee---------	Moderately limited ~wetness (moderately limited)	 0.45	Limited ~deep to water (limited) ~infrequent flooding (moderately limited)	 0.60 0.50	Not limited		Limited ~deep to water (limited)	 0.60	Slightly limited ~seepage (slightly limited)	 0.15
6A: Ethel----------	Very limited ~wetness (very limited)	 1.00	Limited ~infrequent flooding (limited)	 0.80	Not limited		Not limited		Slightly limited ~seepage (slightly limited)	 0.15
7A: Forestdale-----	Very limited ~wetness (very limited) ~flooding (prolonged) (slightly limited)	 1.00 0.20	Slightly limited ~flooding (prolonged) (slightly limited) ~deep to water (slightly limited)	 0.20 0.15	Slightly limited ~flooding (prolonged) (slightly limited)	 0.20	Slightly limited ~deep to water (slightly limited)	 0.15	Not limited	

Table 9b.--Wildlife Habitat--Continued

Map symbol and soil name	Upland mixed deciduous-conifer trees: Rating class and limiting features	Value	Riparian herbaceous plants: Rating class and limiting features	Value	Riparian shrubs, vines, and trees: Rating class and limiting features	Value	Freshwater wetland plants: Rating class and limiting features	Value	Irrigated freshwater wetland plants: Rating class and limiting features	Value
8A: Hebert	Moderately limited ~wetness (moderately limited)	 0.51	Limited ~infrequent flooding (limited) ~deep to water (moderately limited)	 0.80 0.53	Not limited		Moderately limited ~deep to water (moderately limited)	 0.53	Slightly limited ~seepage (slightly limited)	 0.15
9A, 9B: Immanuel	Moderately limited ~wetness (moderately limited)	 0.59	Limited ~infrequent flooding (limited) ~deep to water (moderately limited)	 0.80 0.45	Not limited		Moderately limited ~deep to water (moderately limited)	 0.45	Slightly limited ~seepage (slightly limited)	 0.15
9C: Immanuel	Moderately limited ~wetness (moderately limited)	 0.59	Limited ~infrequent flooding (limited) ~deep to water (moderately limited)	 0.80 0.45	Not limited		Moderately limited ~deep to water (moderately limited)	 0.45	Limited ~slope (limited) ~seepage (slightly limited)	 0.80 0.15
9D, 9E: Immanuel	Moderately limited ~wetness (moderately limited)	 0.59	Limited ~infrequent flooding (limited) ~deep to water (moderately limited)	 0.80 0.45	Not limited		Moderately limited ~deep to water (moderately limited)	 0.45	Very limited ~slope (very limited) ~seepage (slightly limited)	 1.00 0.15
10A: Keo	Not limited		Moderately limited ~infrequent flooding (moderately limited)	 0.50	Not limited		Not limited		Moderately limited ~seepage (moderately limited)	 0.45
10C: Keo	Not limited		Moderately limited ~infrequent flooding (moderately limited)	 0.50	Not limited		Not limited		Moderately limited ~seepage (moderately limited) ~slope (slightly limited)	 0.45 0.17
11A: Kobel	Very limited ~wetness (very limited) ~flooding (prolonged) (slightly limited)	 1.00 0.20	Slightly limited ~flooding (prolonged) (slightly limited)	 0.20	Slightly limited ~flooding (prolonged) (slightly limited)	 0.20	Not limited		Not limited	

Table 9b.--Wildlife Habitat--Continued

Map symbol and soil name	Upland mixed deciduous-conifer trees: Rating class and limiting features	Value	Riparian herbaceous plants: Rating class and limiting features	Value	Riparian shrubs, vines, and trees: Rating class and limiting features	Value	Freshwater wetland plants: Rating class and limiting features	Value	Irrigated freshwater wetland plants: Rating class and limiting features	Value
12A:										
Kobel----------	Very limited		Limited		Limited		Limited		Limited	
	~wetness (very limited)	1.00	~seasonally ponded (limited)	0.80	~seasonally ponded (limited)	0.80	~seasonally ponded (limited)	0.80	~seasonally ponded (limited)	0.80
	~seasonally ponded (limited)	0.80	~flooding (prolonged) (slightly limited)	0.20	~flooding (prolonged) (slightly limited)	0.20				
	~flooding (prolonged) (slightly limited)	0.20								
13A:										
Lagrue---------	Very limited		Limited		Not limited		Not limited		Not limited	
	~wetness (very limited)	1.00	~infrequent flooding (limited)	0.80						
14B:										
Muskogee-------	Limited		Limited		Not limited		Slightly limited		Not limited	
	~wetness (limited)	0.99	~infrequent flooding (limited)	0.80			~deep to water (slightly limited)	0.30		
			~deep to water (slightly limited)	0.30						
14C:										
Muskogee-------	Limited		Limited		Not limited		Slightly limited		Limited	
	~wetness (limited)	0.99	~infrequent flooding (limited)	0.80			~deep to water (slightly limited)	0.30	~slope (limited)	0.80
			~deep to water (slightly limited)	0.30						
14D:										
Muskogee-------	Limited		Limited		Not limited		Slightly limited		Very limited	
	~wetness (limited)	0.99	~infrequent flooding (limited)	0.80			~deep to water (slightly limited)	0.30	~slope (very limited)	1.00
			~deep to water (slightly limited)	0.30						
15A:										
Oaklimeter-----	Moderately limited		Moderately limited		Not limited		Moderately limited		Moderately limited	
	~wetness (moderately limited)	0.59	~infrequent flooding (moderately limited)	0.50			~deep to water (moderately limited)	0.45	~seepage (moderately limited)	0.45
			~deep to water (moderately limited)	0.45						
16A:										
Overcup--------	Very limited		Limited		Not limited		Not limited		Not limited	
	~wetness (very limited)	1.00	~infrequent flooding (limited)	0.80						

Table 9b.--Wildlife Habitat--Continued

Map symbol and soil name	Upland mixed deciduous-conifer trees: Rating class and limiting features	Value	Riparian herbaceous plants: Rating class and limiting features	Value	Riparian shrubs, vines, and trees: Rating class and limiting features	Value	Freshwater wetland plants: Rating class and limiting features	Value	Irrigated freshwater wetland plants: Rating class and limiting features	Value
17A: Perry	Very limited ~wetness (very limited)	 1.00	Limited ~infrequent flooding (limited)	 0.80	Not limited		Not limited		Not limited	
18A: Perry	Very limited ~wetness (very limited) ~flooding (prolonged) (slightly limited)	 1.00 0.20	Slightly limited ~flooding (prolonged) (slightly limited)	 0.20	Slightly limited ~flooding (prolonged) (slightly limited)	 0.20	Not limited		Not limited	
19A: Portland	Limited ~wetness (limited)	 0.99	Limited ~infrequent flooding (limited) ~deep to water (slightly limited)	 0.80 0.30	Not limited		Slightly limited ~deep to water (slightly limited)	 0.30	Not limited	
20A: Portland	Limited ~wetness (limited)	 0.99	Slightly limited ~deep to water (slightly limited)	 0.30	Not limited		Slightly limited ~deep to water (slightly limited)	 0.30	Not limited	
21A, 21B: Rilla	Not limited		Limited ~infrequent flooding (limited)	 0.80	Not limited		Not limited		Moderately limited ~seepage (moderately limited)	 0.45
22: Riverwash	Not rated		Not rated		Not rated		Not rated		Not rated	
23A, 23B: Stuttgart	Limited ~wetness (limited)	 0.99	Limited ~infrequent flooding (limited) ~deep to water (slightly limited)	 0.80 0.30	Not limited		Slightly limited ~deep to water (slightly limited)	 0.30	Not limited	
24A: Tichnor	Very limited ~wetness (very limited) ~flooding (prolonged) (slightly limited)	 1.00 0.20	Slightly limited ~flooding (prolonged) (slightly limited)	 0.20	Slightly limited ~flooding (prolonged) (slightly limited)	 0.20	Not limited		Slightly limited ~seepage (slightly limited)	 0.15

Table 9b.--Wildlife Habitat--Continued

Map symbol and soil name	Upland mixed deciduous-conifer trees		Riparian herbaceous plants		Riparian shrubs, vines, and trees		Freshwater wetland plants		Irrigated freshwater wetland plants	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
25A:										
Tichnor--------	Very limited		Limited		Limited		Limited		Limited	
	~wetness (very limited)	1.00	~flooding (prolonged) (limited)	0.90	~flooding (prolonged) (limited)	0.90	~seasonally ponded (limited)	0.80	~seasonally ponded (limited)	0.80
	~flooding (prolonged) (limited)	0.90	~seasonally ponded (limited)	0.80	~seasonally ponded (limited)	0.80			~seepage (slightly limited)	0.15
	~seasonally ponded (limited)	0.80								
26C:										
Udipsamments---	Very limited		Very limited		Very limited		Very limited		Very limited	
	~droughty (very limited)	1.00	~deep to water (very limited)	1.00	~droughty (very limited)	1.00	~deep to water (very limited)	1.00	~seepage (very limited)	1.00
			~infrequent flooding (limited)	0.80	~deep to water (limited)	0.85	~too sandy (moderately limited)	0.50	~deep to water (limited)	0.85
			~too sandy (moderately limited)	0.50					~too sandy (moderately limited)	0.50
27:										
Water----------	Not rated		Not rated		Not rated		Not rated		Not rated	
28B:										
Yancopin-------	Moderately limited		Limited		Not limited		Limited		Slightly limited	
	~wetness (moderately limited)	0.37	~deep to water (limited)	0.82			~deep to water (limited)	0.82	~seepage (slightly limited)	0.15
29A:										
Yorktown-------	Very limited		Limited		Limited		Limited		Limited	
	~wetness (very limited)	1.00	~flooding (prolonged) (limited)	0.90	~flooding (prolonged) (limited)	0.90	~seasonally ponded (limited)	0.80	~seasonally ponded (limited)	0.80
	~flooding (prolonged) (limited)	0.90	~seasonally ponded (limited)	0.80	~seasonally ponded (limited)	0.80				
	~seasonally ponded (limited)	0.80								
DAM:										
Dam------------	Not rated		Not rated		Not rated		Not rated		Not rated	
LVS:										
Levee----------	Not rated		Not rated		Not rated		Not rated		Not rated	

Table 10.--Building Site Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value	Local roads and streets: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
1C:										
Crevasse	Very limited		Very limited		Very limited		Very limited		Very limited	
	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~droughty (very limited)	1.00
									~flooding (moderately limited)	0.60
2B:										
Desha	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~low strength (very limited)	1.00	~wetness (very limited)	1.00
	~flooding (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~too clayey (very limited)	1.00
	~shrink-swell (very limited)	1.00	~shrink-swell (very limited)	1.00	~shrink-swell (very limited)	1.00	~flooding (very limited)	1.00	~flooding (moderately limited)	0.60
3A:										
Dewitt	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~low strength (very limited)	1.00	~wetness (very limited)	1.00
	~shrink-swell (very limited)	1.00	~shrink-swell (limited)	0.99	~shrink-swell (very limited)	1.00	~wetness (very limited)	1.00	~too acid (slightly limited)	0.12
							~shrink-swell (very limited)	1.00		
4B:										
Dubbs	Moderately limited		Slightly limited		Moderately limited		Very limited		Slightly limited	
	~shrink-swell (moderately limited)	0.45	~shrink-swell (slightly limited)	0.19	~shrink-swell (moderately limited)	0.45	~low strength (very limited)	1.00	~too acid (slightly limited)	0.12
							~shrink-swell (moderately limited)	0.45		
5B:										
Dundee	Very limited		Very limited		Very limited		Very limited		Moderately limited	
	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~flooding (moderately limited)	0.60
	~shrink-swell (moderately limited)	0.45	~wetness (very limited)	1.00	~shrink-swell (moderately limited)	0.45	~low strength (very limited)	1.00		
	~wetness (moderately limited)	0.45	~shrink-swell (moderately limited)	0.45			~shrink-swell (moderately limited)	0.45		

Table 10.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value	Local roads and streets: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
6A:										
Ethel----------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
	~shrink-swell (moderately limited)	0.45	~shrink-swell (slightly limited)	0.20	~shrink-swell (moderately limited)	0.45	~low strength (very limited)	1.00		
							~shrink-swell (moderately limited)	0.45		
7A:										
Forestdale-----	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~low strength (very limited)	1.00	~flooding (very limited)	1.00
	~flooding (very limited)	1.00	~wetness (very limited)	1.00	~shrink-swell (very limited)	1.00	~flooding (very limited)	1.00	~wetness (limited)	0.81
	~shrink-swell (very limited)	1.00	~shrink-swell (very limited)	1.00	~wetness (limited)	0.81	~shrink-swell (very limited)	1.00	~too clayey (moderately limited)	0.60
8A:										
Hebert---------	Moderately limited		Very limited		Moderately limited		Very limited		Slightly limited	
	~wetness (moderately limited)	0.51	~wetness (very limited)	1.00	~shrink-swell (moderately limited)	0.45	~low strength (very limited)	1.00	~wetness (slightly limited)	0.13
	~shrink-swell (moderately limited)	0.45	~shrink-swell (slightly limited)	0.29	~wetness (slightly limited)	0.13	~shrink-swell (moderately limited)	0.45		
							~wetness (slightly limited)	0.13		
9A,9B:										
Immanuel-------	Moderately limited		Very limited		Slightly limited		Very limited		Slightly limited	
	~wetness (moderately limited)	0.59	~wetness (very limited)	1.00	~wetness (slightly limited)	0.28	~low strength (very limited)	1.00	~wetness (slightly limited)	0.28
							~wetness (slightly limited)	0.28		
9C:										
Immanuel-------	Moderately limited		Very limited		Moderately limited		Very limited		Slightly limited	
	~wetness (moderately limited)	0.59	~wetness (very limited)	1.00	~slope (moderately limited)	0.60	~low strength (very limited)	1.00	~wetness (slightly limited)	0.28
					~wetness (slightly limited)	0.28	~wetness (slightly limited)	0.28		

Table 10.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value	Local roads and streets: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
9D:										
Immanuel-------	Limited		Very limited		Very limited		Very limited		Moderately limited	
	~slope (limited)	0.72	~wetness (very limited)	1.00	~slope (very limited)	1.00	~low strength (very limited)	1.00	~slope (moderately limited)	0.50
	~wetness (moderately limited)	0.59	~slope (limited)	0.72	~wetness (slightly limited)	0.28	~slope (moderately limited)	0.50	~wetness (slightly limited)	0.28
							~wetness (slightly limited)	0.28		
9E:										
Immanuel-------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~slope (very limited)	1.00	~wetness (very limited)	1.00	~slope (very limited)	1.00	~slope (very limited)	1.00	~slope (very limited)	1.00
	~wetness (moderately limited)	0.59	~slope (very limited)	1.00	~wetness (slightly limited)	0.28	~low strength (very limited)	1.00	~wetness (slightly limited)	0.28
							~wetness (slightly limited)	0.28		
10A, 10C:										
Keo------------	Very limited		Very limited		Very limited		Very limited		Moderately limited	
	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~flooding (moderately limited)	0.60
11A:										
Kobel----------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~shrink-swell (very limited)	1.00	~flooding (very limited)	1.00	~low strength (very limited)	1.00	~wetness (very limited)	1.00
	~shrink-swell (very limited)	1.00	~flooding (very limited)	1.00	~shrink-swell (very limited)	1.00	~wetness (very limited)	1.00	~flooding (very limited)	1.00
	~flooding (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~shrink-swell (very limited)	1.00	~too clayey (very limited)	1.00
12A:										
Kobel----------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~ponded (very limited)	1.00	~ponded (wetness) (very limited)	1.00	~low strength (very limited)	1.00	~wetness (very limited)	1.00
	~ponded (very limited)	1.00	~shrink-swell (very limited)	1.00	~flooding (very limited)	1.00	~ponded (wetness) (very limited)	1.00	~ponded (wetness) (very limited)	1.00
	~shrink-swell (very limited)	1.00	~flooding (very limited)	1.00	~shrink-swell (very limited)	1.00	~wetness (very limited)	1.00	~flooding (very limited)	1.00

Table 10.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value	Local roads and streets: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
13A:										
Lagrue	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~low strength (very limited)	1.00	~wetness (very limited)	1.00
	~shrink-swell (very limited)	1.00	~shrink-swell (very limited)	1.00	~shrink-swell (very limited)	1.00	~wetness (very limited)	1.00	~too clayey (moderately limited)	0.60
							~shrink-swell (very limited)	1.00		
14B:										
Muskogee	Very limited		Very limited		Very limited		Very limited		Limited	
	~shrink-swell (very limited)	1.00	~wetness (very limited)	1.00	~shrink-swell (very limited)	1.00	~low strength (very limited)	1.00	~wetness (limited)	0.60
	~wetness (limited)	0.99	~shrink-swell (very limited)	1.00	~wetness (limited)	0.60	~shrink-swell (very limited)	1.00		
							~wetness (limited)	0.60		
14C:										
Muskogee	Very limited		Very limited		Very limited		Very limited		Limited	
	~shrink-swell (very limited)	1.00	~wetness (very limited)	1.00	~shrink-swell (very limited)	1.00	~low strength (very limited)	1.00	~wetness (limited)	0.60
	~wetness (limited)	0.99	~shrink-swell (very limited)	1.00	~wetness (limited)	0.60	~shrink-swell (very limited)	1.00		
					~slope (moderately limited)	0.60	~wetness (limited)	0.60		
14D:										
Muskogee	Very limited		Very limited		Very limited		Very limited		Limited	
	~shrink-swell (very limited)	1.00	~wetness (very limited)	1.00	~slope (very limited)	1.00	~low strength (very limited)	1.00	~wetness (limited)	0.60
	~wetness (limited)	0.99	~shrink-swell (very limited)	1.00	~shrink-swell (very limited)	1.00	~shrink-swell (very limited)	1.00	~slope (moderately limited)	0.50
	~slope (limited)	0.72	~slope (limited)	0.72	~wetness (limited)	0.60	~wetness (limited)	0.60		
15A:										
Oaklimeter	Very limited		Very limited		Very limited		Very limited		Moderately limited	
	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~flooding (moderately limited)	0.60
	~wetness (moderately limited)	0.59	~wetness (very limited)	1.00	~wetness (slightly limited)	0.28	~wetness (slightly limited)	0.28	~wetness (slightly limited)	0.28
									~too acid (slightly limited)	0.12

Table 10.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value	Local roads and streets: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
16A:										
Overcup	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~low strength (very limited)	1.00	~wetness (very limited)	1.00
	~shrink-swell (very limited)	1.00	~shrink-swell (very limited)	1.00	~shrink-swell (very limited)	1.00	~wetness (very limited)	1.00		
							~shrink-swell (very limited)	1.00		
17A:										
Perry	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~shrink-swell (very limited)	1.00	~shrink-swell (very limited)	1.00	~low strength (very limited)	1.00	~wetness (very limited)	1.00
	~shrink-swell (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~too clayey (very limited)	1.00
							~shrink-swell (very limited)	1.00		
18A:										
Perry	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~shrink-swell (very limited)	1.00	~flooding (very limited)	1.00	~low strength (very limited)	1.00	~wetness (very limited)	1.00
	~shrink-swell (very limited)	1.00	~flooding (very limited)	1.00	~shrink-swell (very limited)	1.00	~wetness (very limited)	1.00	~flooding (very limited)	1.00
	~flooding (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~shrink-swell (very limited)	1.00	~too clayey (very limited)	1.00
19A:										
Portland	Very limited		Very limited		Very limited		Very limited		Very limited	
	~shrink-swell (very limited)	1.00	~wetness (very limited)	1.00	~shrink-swell (very limited)	1.00	~low strength (very limited)	1.00	~too clayey (very limited)	1.00
	~wetness (limited)	0.99	~shrink-swell (very limited)	1.00	~wetness (limited)	0.60	~shrink-swell (very limited)	1.00	~wetness (limited)	0.60
							~wetness (limited)	0.60		
20A:										
Portland	Very limited		Very limited		Very limited		Very limited		Very limited	
	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~low strength (very limited)	1.00	~flooding (very limited)	1.00
	~shrink-swell (very limited)	1.00	~wetness (very limited)	1.00	~shrink-swell (very limited)	1.00	~flooding (very limited)	1.00	~too clayey (very limited)	1.00
	~wetness (limited)	0.99	~shrink-swell (very limited)	1.00	~wetness (limited)	0.60	~shrink-swell (very limited)	1.00	~wetness (limited)	0.60

Table 10.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value	Local roads and streets: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
21A, 21B:										
Rilla----------	Moderately limited		Slightly limited		Moderately limited		Very limited		Not limited	
	~shrink-swell (moderately limited)	0.45	~shrink-swell (slightly limited)	0.04	~shrink-swell (moderately limited)	0.45	~low strength (very limited)	1.00		
							~shrink-swell (moderately limited)	0.45		
22:										
Riverwash------	Not rated		Not rated		Not rated		Not rated		Not rated	
23A, 23B:										
Stuttgart------	Limited		Very limited		Limited		Very limited		Limited	
	~wetness (limited)	0.99	~wetness (very limited)	1.00	~wetness (limited)	0.60	~low strength (very limited)	1.00	~wetness (limited)	0.60
	~shrink-swell (moderately limited)	0.45	~shrink-swell (moderately limited)	0.58	~shrink-swell (moderately limited)	0.45	~wetness (limited)	0.60		
							~shrink-swell (moderately limited)	0.45		
24A:										
Tichnor--------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
	~flooding (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~flooding (very limited)	1.00	~flooding (very limited)	1.00
									~too acid (moderately limited)	0.42
25A:										
Tichnor--------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~ponded (very limited)	1.00	~ponded (wetness) (very limited)	1.00	~ponded (wetness) (very limited)	1.00	~wetness (very limited)	1.00
	~ponded (very limited)	1.00	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~wetness (very limited)	1.00	~ponded (wetness) (very limited)	1.00
	~flooding (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~flooding (very limited)	1.00	~flooding (very limited)	1.00
26C:										
Udipsamments---	Not limited		Slightly limited		Not limited		Not limited		Very limited	
			~wetness (slightly limited)	0.24					~droughty (very limited)	1.00
27:										
Water----------	Not rated		Not rated		Not rated		Not rated		Not rated	

Table 10.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value	Local roads and streets: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
28B:										
Yancopin	Very limited ~flooding (very limited) ~shrink-swell (moderately limited) ~wetness (moderately limited)	 1.00 0.45 0.37	Very limited ~flooding (very limited) ~wetness (limited) ~shrink-swell (moderately limited)	 1.00 0.99 0.45	Very limited ~flooding (very limited) ~shrink-swell (moderately limited)	 1.00 0.45	Very limited ~flooding (very limited) ~low strength (very limited) ~shrink-swell (moderately limited)	 1.00 1.00 0.45	Very limited ~flooding (very limited) ~too clayey (moderately limited)	 1.00 0.60
29A:										
Yorktown	Very limited ~wetness (very limited) ~ponded (very limited) ~shrink-swell (very limited)	 1.00 1.00 1.00	Very limited ~ponded (very limited) ~shrink-swell (very limited) ~flooding (very limited)	 1.00 1.00 1.00	Very limited ~ponded (wetness) (very limited) ~flooding (very limited) ~shrink-swell (very limited)	 1.00 1.00 1.00	Very limited ~low strength (very limited) ~ponded (wetness) (very limited) ~wetness (very limited)	 1.00 1.00 1.00	Very limited ~wetness (very limited) ~ponded (wetness) (very limited) ~flooding (very limited)	 1.00 1.00 1.00
DAM:										
Dam	Not rated		Not rated		Not rated		Not rated		Not rated	
LVS:										
Levee	Not rated		Not rated		Not rated		Not rated		Not rated	

Table 11.--Sanitary Facilities

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Septic tank absorption field		Sewage lagoons		Sanitary landfill (trench)		Sanitary landfill (area)		Daily cover for landfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1C:										
Crevasse	Very limited		Very limited		Very limited		Very limited		Very limited	
	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~seepage (very limited)	1.00
	~poor filter (very limited)	1.00	~seepage (very limited)	1.00	~too sandy (very limited)	1.00	~seepage (very limited)	1.00	~too sandy (very limited)	1.00
			~slope (slightly limited)	0.02	~seepage (very limited)	1.00				
2B:										
Desha	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~flooding (very limited)	1.00	~wetness (very limited)	1.00	~flooding (very limited)	1.00	~wetness (very limited)	1.00
	~flooding (very limited)	1.00	~wetness (very limited)	1.00	~flooding (very limited)	1.00	~wetness (very limited)	1.00	~too clayey (very limited)	1.00
	~percs slowly (very limited)	1.00			~too clayey (very limited)	1.00			~hard to pack (limited)	0.70
3A:										
Dewitt	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
	~percs slowly (limited)	0.93	~seepage (moderately limited)	0.50	~too clayey (moderately limited)	0.51			~hard to pack (limited)	0.70
									~too clayey (slightly limited)	0.26
4B:										
Dubbs	Slightly limited		Very limited		Limited		Not limited		Slightly limited	
	~percs slowly (slightly limited)	0.25	~seepage (very limited)	1.00	~seepage (limited)	0.79			~too acid (slightly limited)	0.12
					~too clayey (slightly limited)	0.15			~too clayey (slightly limited)	0.03
					~too acid (slightly limited)	0.12				
5B:										
Dundee	Very limited		Very limited		Very limited		Very limited		Moderately limited	
	~wetness (very limited)	1.00	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~wetness (moderately limited)	0.40
	~flooding (very limited)	1.00	~wetness (very limited)	1.00	~wetness (limited)	0.79	~wetness (limited)	0.60	~too acid (slightly limited)	0.12
	~percs slowly (limited)	0.74	~seepage (moderately limited)	0.50	~too acid (slightly limited)	0.12				

Table 11.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption field: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value	Sanitary landfill (trench): Rating class and limiting features	Value	Sanitary landfill (area): Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
5B:										
Dundee---------	Very limited		Very limited		Very limited		Very limited		Moderately limited	
	~wetness (very limited)	1.00	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~wetness (moderately limited)	0.40
	~flooding (very limited)	1.00	~wetness (very limited)	1.00	~wetness (limited)	0.79	~wetness (limited)	0.60	~too acid (slightly limited)	0.12
	~percs slowly (limited)	0.74	~seepage (moderately limited)	0.50	~too acid (slightly limited)	0.12				
6A:										
Ethel----------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
	~percs slowly (limited)	0.93	~seepage (moderately limited)	0.50	~too acid (slightly limited)	0.12			~too acid (slightly limited)	0.12
					~too clayey (slightly limited)	0.02				
7A:										
Forestdale-----	Very limited		Very limited		Very limited		Very limited		Limited	
	~wetness (very limited)	1.00	~flooding (very limited)	1.00	~wetness (very limited)	1.00	~flooding (very limited)	1.00	~wetness (limited)	0.81
	~flooding (very limited)	1.00	~wetness (very limited)	1.00	~flooding (very limited)	1.00	~wetness (very limited)	1.00	~too clayey (moderately limited)	0.60
	~percs slowly (very limited)	1.00			~too clayey (limited)	0.80			~too acid (slightly limited)	0.12
8A:										
Hebert---------	Very limited		Very limited		Limited		Limited		Moderately limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (limited)	0.89	~wetness (limited)	0.69	~wetness (moderately limited)	0.45
	~percs slowly (limited)	0.74	~seepage (moderately limited)	0.50						
9A, 9B:										
Immanuel-------	Very limited		Very limited		Limited		Limited		Moderately limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (limited)	0.99	~wetness (limited)	0.80	~wetness (moderately limited)	0.50
	~percs slowly (limited)	0.74	~seepage (very limited)	1.00			~seepage (limited)	0.75		

Table 11.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption field: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value	Sanitary landfill (trench): Rating class and limiting features	Value	Sanitary landfill (area): Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
9C:										
Immanuel-------	Very limited		Very limited		Limited		Limited		Moderately limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (limited)	0.99	~wetness (limited)	0.80	~wetness (moderately limited)	0.50
	~percs slowly (limited)	0.74	~seepage (very limited)	1.00			~seepage (limited)	0.75		
			~slope (limited)	0.80						
9D:										
Immanuel-------	Very limited		Very limited		Limited		Limited		Moderately limited	
	~wetness (very limited)	1.00	~slope (very limited)	1.00	~wetness (limited)	0.99	~wetness (limited)	0.80	~slope (moderately limited)	0.50
	~percs slowly (limited)	0.74	~wetness (very limited)	1.00	~slope (moderately limited)	0.50	~seepage (limited)	0.75	~wetness (moderately limited)	0.50
	~slope (moderately limited)	0.50	~seepage (very limited)	1.00			~slope (moderately limited)	0.50		
9E:										
Immanuel-------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~slope (very limited)	1.00	~slope (very limited)	1.00	~slope (very limited)	1.00	~slope (very limited)	1.00	~slope (very limited)	1.00
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (limited)	0.99	~wetness (limited)	0.80	~wetness (moderately limited)	0.50
	~percs slowly (limited)	0.74	~seepage (very limited)	1.00			~seepage (limited)	0.75		
10A:										
Keo------------	Very limited		Very limited		Very limited		Very limited		Slightly limited	
	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~seepage (slightly limited)	0.21
	~percs slowly (slightly limited)	0.25	~seepage (very limited)	1.00	~seepage (limited)	0.72	~seepage (limited)	0.66		
10C:										
Keo------------	Very limited		Very limited		Very limited		Very limited		Slightly limited	
	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~seepage (slightly limited)	0.21
	~percs slowly (slightly limited)	0.25	~seepage (very limited)	1.00	~seepage (limited)	0.72	~seepage (limited)	0.66		
			~slope (slightly limited)	0.17						

Table 11.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption field: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value	Sanitary landfill (trench): Rating class and limiting features	Value	Sanitary landfill (area): Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
11A:										
Kobel----------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~flooding (very limited)	1.00	~wetness (very limited)	1.00	~flooding (very limited)	1.00	~wetness (very limited)	1.00
	~flooding (very limited)	1.00	~wetness (very limited)	1.00	~flooding (very limited)	1.00	~wetness (very limited)	1.00	~hard to pack (limited)	0.70
	~percs slowly (very limited)	1.00			~too clayey (limited)	0.75			~too clayey (moderately limited)	0.53
12A:										
Kobel----------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~ponded (wetness) (very limited)	1.00	~flooding (very limited)	1.00	~ponded (wetness) (very limited)	1.00	~flooding (very limited)	1.00	~ponded (wetness) (very limited)	1.00
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
	~flooding (very limited)	1.00	~ponded (wetness) (very limited)	1.00	~flooding (very limited)	1.00	~ponded (wetness) (very limited)	1.00	~hard to pack (limited)	0.70
13A:										
Lagrue---------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
	~percs slowly (very limited)	1.00			~too clayey (limited)	0.70			~hard to pack (limited)	0.70
					~too acid (moderately limited)	0.42			~too clayey (moderately limited)	0.45
14B:										
Muskogee-------	Very limited		Very limited		Very limited		Limited		Limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (limited)	0.99	~hard to pack (limited)	0.70
	~percs slowly (limited)	0.93			~too clayey (limited)	0.75			~wetness (moderately limited)	0.60
									~too clayey (moderately limited)	0.53
14C:										
Muskogee-------	Very limited		Very limited		Very limited		Limited		Limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (limited)	0.99	~hard to pack (limited)	0.70
	~percs slowly (limited)	0.93	~slope (limited)	0.80	~too clayey (limited)	0.75			~wetness (moderately limited)	0.60
									~too clayey (moderately limited)	0.53

Table 11.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption field: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value	Sanitary landfill (trench): Rating class and limiting features	Value	Sanitary landfill (area): Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
14D:										
Muskogee-------	Very limited		Very limited		Very limited		Limited		Limited	
	~wetness (very limited)	1.00	~slope (very limited)	1.00	~wetness (very limited)	1.00	~wetness (limited)	0.99	~hard to pack (limited)	0.70
	~percs slowly (limited)	0.93	~wetness (very limited)	1.00	~too clayey (limited)	0.75	~slope (moderately limited)	0.50	~wetness (moderately limited)	0.60
	~slope (moderately limited)	0.50			~slope (moderately limited)	0.50			~too clayey (moderately limited)	0.53
15A:										
Oaklimeter-----	Very limited		Very limited		Very limited		Very limited		Moderately limited	
	~wetness (very limited)	1.00	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~wetness (moderately limited)	0.50
	~flooding (very limited)	1.00	~wetness (very limited)	1.00	~wetness (limited)	0.99	~wetness (limited)	0.80	~too acid (slightly limited)	0.30
	~percs slowly (slightly limited)	0.25	~seepage (moderately limited)	0.50	~too acid (slightly limited)	0.30				
16A:										
Overcup--------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
	~percs slowly (very limited)	1.00			~too clayey (limited)	0.75			~hard to pack (limited)	0.70
									~too clayey (moderately limited)	0.53
17A:										
Perry----------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
	~percs slowly (very limited)	1.00			~too clayey (very limited)	1.00			~too clayey (very limited)	1.00
									~hard to pack (limited)	0.70
18A:										
Perry----------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~flooding (very limited)	1.00	~wetness (very limited)	1.00	~flooding (very limited)	1.00	~wetness (very limited)	1.00
	~flooding (very limited)	1.00	~wetness (very limited)	1.00	~flooding (very limited)	1.00	~wetness (very limited)	1.00	~too clayey (very limited)	1.00
	~percs slowly (very limited)	1.00			~too clayey (very limited)	1.00			~hard to pack (limited)	0.70

Table 11.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption field		Sewage lagoons		Sanitary landfill (trench)		Sanitary landfill (area)		Daily cover for landfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
19A:										
Portland-------	Very limited		Very limited		Very limited		Limited		Very limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (limited)	0.99	~too clayey (very limited)	1.00
	~percs slowly (very limited)	1.00	~seepage (slightly limited)	0.18	~too clayey (very limited)	1.00			~wetness (moderately limited)	0.60
20A:										
Portland-------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~flooding (very limited)	1.00	~wetness (very limited)	1.00	~flooding (very limited)	1.00	~too clayey (very limited)	1.00
	~flooding (very limited)	1.00	~wetness (very limited)	1.00	~flooding (very limited)	1.00	~wetness (limited)	0.99	~wetness (moderately limited)	0.60
	~percs slowly (very limited)	1.00	~seepage (slightly limited)	0.18	~too clayey (very limited)	1.00				
21A, 21B:										
Rilla----------	Slightly limited		Moderately limited		Slightly limited		Not limited		Slightly limited	
	~percs slowly (slightly limited)	0.25	~seepage (moderately limited)	0.50	~too acid (slightly limited)	0.30			~too acid (slightly limited)	0.30
22:										
Riverwash------	Not rated		Not rated		Not rated		Not rated		Not rated	
23A, 23B:										
Stuttgart------	Very limited		Very limited		Very limited		Limited		Moderately limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (limited)	0.99	~wetness (moderately limited)	0.60
	~percs slowly (very limited)	1.00			~too clayey (limited)	0.70			~too clayey (moderately limited)	0.45
24A:										
Tichnor--------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~flooding (very limited)	1.00	~wetness (very limited)	1.00	~flooding (very limited)	1.00	~wetness (very limited)	1.00
	~flooding (very limited)	1.00	~wetness (very limited)	1.00	~flooding (very limited)	1.00	~wetness (very limited)	1.00	~too acid (moderately limited)	0.42
	~percs slowly (limited)	0.74	~seepage (moderately limited)	0.50	~too acid (moderately limited)	0.42				

Table 11.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption field: Rating class and limiting features	Septic tank absorption field: Value	Sewage lagoons: Rating class and limiting features	Sewage lagoons: Value	Sanitary landfill (trench): Rating class and limiting features	Sanitary landfill (trench): Value	Sanitary landfill (area): Rating class and limiting features	Sanitary landfill (area): Value	Daily cover for landfill: Rating class and limiting features	Daily cover for landfill: Value
25A:										
Tichnor--------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~ponded (wetness) (very limited)	1.00	~flooding (very limited)	1.00	~ponded (wetness) (very limited)	1.00	~flooding (very limited)	1.00	~ponded (wetness) (very limited)	1.00
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
	~flooding (very limited)	1.00	~ponded (wetness) (very limited)	1.00	~flooding (very limited)	1.00	~ponded (wetness) (very limited)	1.00	~too acid (moderately limited)	0.42
26C:										
Udipsamments---	Very limited		Very limited		Very limited		Very limited		Very limited	
	~poor filter (very limited)	1.00	~seepage (very limited)	1.00	~too sandy (very limited)	1.00	~seepage (very limited)	1.00	~seepage (very limited)	1.00
	~wetness (moderately limited)	0.37	~slope (slightly limited)	0.08	~seepage (very limited)	1.00			~too sandy (very limited)	1.00
					~wetness (slightly limited)	0.19				
27:										
Water----------	Not rated		Not rated		Not rated		Not rated		Not rated	
28B:										
Yancopin-------	Very limited		Very limited		Very limited		Very limited		Moderately limited	
	~wetness (very limited)	1.00	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~wetness (moderately limited)	0.35
	~flooding (very limited)	1.00	~wetness (very limited)	1.00	~wetness (limited)	0.69	~wetness (moderately limited)	0.44		
	~percs slowly (slightly limited)	0.30	~seepage (moderately limited)	0.32	~too clayey (slightly limited)	0.02				
29A:										
Yorktown-------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~ponded (wetness) (very limited)	1.00	~flooding (very limited)	1.00	~ponded (wetness) (very limited)	1.00	~flooding (very limited)	1.00	~ponded (wetness) (very limited)	1.00
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
	~flooding (very limited)	1.00	~ponded (wetness) (very limited)	1.00	~flooding (very limited)	1.00	~ponded (wetness) (very limited)	1.00	~too clayey (very limited)	1.00
DAM:										
Dam------------	Not rated		Not rated		Not rated		Not rated		Not rated	
LVS:										
Levee----------	Not rated		Not rated		Not rated		Not rated		Not rated	

Table 12.--Construction Materials and Excavating

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Source for roadfill: Rating class and limiting features	Value	Source for sand: Rating class and limiting features	Value	Source for gravel: Rating class and limiting features	Value	Source for topsoil: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value
1C:										
Crevasse-------	Not limited		Possible source		Very limited		Very limited		Very limited	
			~excess fines	1.00	~excess fines	1.00	~too sandy	1.00	~cutbanks cave	1.00
			(thickest layer)		(bottom layer)		(very limited)		(very limited)	
			~possible source	0.23	~excess fines	1.00			~flooding	0.60
			(bottom layer)		(thickest layer)				(moderately limited)	
2B:										
Desha----------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~low strength	1.00	~excess fines	1.00	~excess fines	1.00	~wetness	1.00	~wetness	1.00
	(very limited)		(thickest layer)		(bottom layer)		(very limited)		(very limited)	
	~wetness	1.00	~excess fines	1.00	~excess fines	1.00	~too clayey	1.00	~too clayey	1.00
	(very limited)		(bottom layer)		(thickest layer)		(very limited)		(very limited)	
	~shrink-swell	1.00							~flooding	0.60
	(very limited)								(moderately limited)	
3A:										
Dewitt---------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~low strength	1.00	~excess fines	1.00	~excess fines	1.00	~wetness	1.00	~wetness	1.00
	(very limited)		(thickest layer)		(bottom layer)		(very limited)		(very limited)	
	~wetness	1.00	~excess fines	1.00	~excess fines	1.00	~too clayey	0.96	~cutbanks cave	0.29
	(very limited)		(bottom layer)		(thickest layer)		(limited)		(slightly limited)	
	~shrink-swell	0.99							~too clayey	0.26
	(limited)								(slightly limited)	
4B:										
Dubbs----------	Very limited		Very limited		Very limited		Moderately limited		Slightly limited	
	~low strength	1.00	~excess fines	1.00	~excess fines	1.00	~too clayey	0.55	~cutbanks cave	0.29
	(very limited)		(thickest layer)		(bottom layer)		(moderately limited)		(slightly limited)	
	~shrink-swell	0.19	~excess fines	1.00	~excess fines	1.00	~too acid	0.12	~too clayey	0.03
	(slightly limited)		(bottom layer)		(thickest layer)		(slightly limited)		(slightly limited)	
5B:										
Dundee---------	Very limited		Very limited		Very limited		Slightly limited		Very limited	
	~low strength	1.00	~excess fines	1.00	~excess fines	1.00	~too clayey	0.25	~wetness	1.00
	(very limited)		(thickest layer)		(bottom layer)		(slightly limited)		(very limited)	
	~shrink-swell	0.45	~excess fines	1.00	~excess fines	1.00	~wetness	0.12	~flooding	0.60
	(moderately limited)		(bottom layer)		(thickest layer)		(slightly limited)		(moderately limited)	
	~wetness	0.12					~too acid	0.12	~cutbanks cave	0.29
	(slightly limited)						(slightly limited)		(slightly limited)	

Table 12.--Construction Materials and Excavating--Continued

Map symbol and soil name	Source for roadfill: Rating class and limiting features	Value	Source for sand: Rating class and limiting features	Value	Source for gravel: Rating class and limiting features	Value	Source for topsoil: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value
6A:										
Ethel----------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~low strength (very limited)	1.00	~excess fines (thickest layer)	1.00	~excess fines (bottom layer)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
	~wetness (very limited)	1.00	~excess fines (bottom layer)	1.00	~excess fines (thickest layer)	1.00			~cutbanks cave (slightly limited)	0.29
	~shrink-swell (slightly limited)	0.20								
7A:										
Forestdale-----	Very limited		Very limited		Very limited		Very limited		Very limited	
	~low strength (very limited)	1.00	~excess fines (thickest layer)	1.00	~excess fines (bottom layer)	1.00	~too clayey (very limited)	1.00	~wetness (very limited)	1.00
	~shrink-swell (very limited)	1.00	~excess fines (bottom layer)	1.00	~excess fines (thickest layer)	1.00	~wetness (limited)	0.96	~flooding (moderately limited)	0.60
	~wetness (limited)	0.96					~too acid (slightly limited)	0.12	~too clayey (moderately limited)	0.60
8A:										
Hebert---------	Very limited		Very limited		Very limited		Slightly limited		Very limited	
	~low strength (very limited)	1.00	~excess fines (thickest layer)	1.00	~excess fines (bottom layer)	1.00	~wetness (slightly limited)	0.26	~wetness (very limited)	1.00
	~shrink-swell (slightly limited)	0.29	~excess fines (bottom layer)	1.00	~excess fines (thickest layer)	1.00	~too clayey (slightly limited)	0.25	~cutbanks cave (slightly limited)	0.29
	~wetness (slightly limited)	0.26								
9A, 9B, 9C:										
Immanuel-------	Very limited		Very limited		Very limited		Moderately limited		Very limited	
	~low strength (very limited)	1.00	~excess fines (thickest layer)	1.00	~excess fines (bottom layer)	1.00	~wetness (moderately limited)	0.48	~wetness (very limited)	1.00
	~wetness (moderately limited)	0.48	~excess fines (bottom layer)	1.00	~excess fines (thickest layer)	1.00	~too acid (slightly limited)	0.30	~cutbanks cave (slightly limited)	0.29
							~too clayey (slightly limited)	0.25		
9D:										
Immanuel-------	Very limited		Very limited		Very limited		Moderately limited		Very limited	
	~low strength (very limited)	1.00	~excess fines (thickest layer)	1.00	~excess fines (bottom layer)	1.00	~slope (moderately limited)	0.50	~wetness (very limited)	1.00
	~wetness (moderately limited)	0.48	~excess fines (bottom layer)	1.00	~excess fines (thickest layer)	1.00	~wetness (moderately limited)	0.48	~slope (moderately limited)	0.50
							~too acid (slightly limited)	0.30	~cutbanks cave (slightly limited)	0.29

Table 12.--Construction Materials and Excavating--Continued

Map symbol and soil name	Source for roadfill: Rating class and limiting features	Value	Source for sand: Rating class and limiting features	Value	Source for gravel: Rating class and limiting features	Value	Source for topsoil: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value
9E:										
Immanuel	Very limited		Very limited		Very limited		Very limited		Very limited	
	~low strength (very limited)	1.00	~excess fines (thickest layer)	1.00	~excess fines (bottom layer)	1.00	~slope (very limited)	1.00	~slope (very limited)	1.00
	~slope (moderately limited)	0.50	~excess fines (bottom layer)	1.00	~excess fines (thickest layer)	1.00	~wetness (moderately limited)	0.48	~wetness (very limited)	1.00
	~wetness (moderately limited)	0.48					~too acid (slightly limited)	0.30	~cutbanks cave (slightly limited)	0.29
10A, 10C:										
Keo	Not limited		Very limited		Very limited		Not limited		Moderately limited	
			~excess fines (thickest layer)	1.00	~excess fines (bottom layer)	1.00			~flooding (moderately limited)	0.60
			~excess fines (bottom layer)	1.00	~excess fines (thickest layer)	1.00			~cutbanks cave (slightly limited)	0.29
11A:										
Kobel	Very limited		Very limited		Very limited		Very limited		Very limited	
	~shrink-swell (very limited)	1.00	~excess fines (thickest layer)	1.00	~excess fines (bottom layer)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
	~low strength (very limited)	1.00	~excess fines (bottom layer)	1.00	~excess fines (thickest layer)	1.00	~too clayey (very limited)	1.00	~flooding (moderately limited)	0.60
	~wetness (very limited)	1.00							~too clayey (moderately limited)	0.53
12A:										
Kobel	Very limited		Very limited		Very limited		Very limited		Very limited	
	~shrink-swell (very limited)	1.00	~excess fines (thickest layer)	1.00	~excess fines (bottom layer)	1.00	~wetness (very limited)	1.00	~ponded (wetness) (very limited)	1.00
	~low strength (very limited)	1.00	~excess fines (bottom layer)	1.00	~excess fines (thickest layer)	1.00	~too clayey (very limited)	1.00	~wetness (very limited)	1.00
	~wetness (very limited)	1.00							~flooding (moderately limited)	0.60
13A:										
Lagrue	Very limited		Very limited		Very limited		Very limited		Very limited	
	~low strength (very limited)	1.00	~excess fines (thickest layer)	1.00	~excess fines (bottom layer)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
	~wetness (very limited)	1.00	~excess fines (bottom layer)	1.00	~excess fines (thickest layer)	1.00	~too clayey (very limited)	1.00	~too clayey (moderately limited)	0.45
	~shrink-swell (very limited)	1.00					~too acid (moderately limited)	0.42	~cutbanks cave (slightly limited)	0.29

Table 12.--Construction Materials and Excavating--Continued

Map symbol and soil name	Source for roadfill: Rating class and limiting features	Value	Source for sand: Rating class and limiting features	Value	Source for gravel: Rating class and limiting features	Value	Source for topsoil: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value
14B, 14C:										
Muskogee-------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~low strength (very limited)	1.00	~excess fines (thickest layer)	1.00	~excess fines (bottom layer)	1.00	~too clayey (very limited)	1.00	~wetness (very limited)	1.00
	~shrink-swell (very limited)	1.00	~excess fines (bottom layer)	1.00	~excess fines (thickest layer)	1.00	~wetness (limited)	0.86	~too clayey (moderately limited)	0.53
	~wetness (limited)	0.86							~cutbanks cave (slightly limited)	0.29
14D:										
Muskogee-------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~low strength (very limited)	1.00	~excess fines (thickest layer)	1.00	~excess fines (bottom layer)	1.00	~too clayey (very limited)	1.00	~wetness (very limited)	1.00
	~shrink-swell (very limited)	1.00	~excess fines (bottom layer)	1.00	~excess fines (thickest layer)	1.00	~wetness (limited)	0.86	~too clayey (moderately limited)	0.53
	~wetness (limited)	0.86					~slope (moderately limited)	0.50	~slope (moderately limited)	0.50
15A:										
Oaklimeter-----	Moderately limited		Very limited		Very limited		Moderately limited		Very limited	
	~wetness (moderately limited)	0.48	~excess fines (thickest layer)	1.00	~excess fines (bottom layer)	1.00	~wetness (moderately limited)	0.48	~wetness (very limited)	1.00
			~excess fines (bottom layer)	1.00	~excess fines (thickest layer)	1.00	~too acid (slightly limited)	0.30	~flooding (moderately limited)	0.60
									~cutbanks cave (slightly limited)	0.29
16A:										
Overcup--------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~low strength (very limited)	1.00	~excess fines (thickest layer)	1.00	~excess fines (bottom layer)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
	~wetness (very limited)	1.00	~excess fines (bottom layer)	1.00	~excess fines (thickest layer)	1.00	~too clayey (very limited)	1.00	~too clayey (moderately limited)	0.53
	~shrink-swell (very limited)	1.00							~cutbanks cave (slightly limited)	0.29
17A:										
Perry----------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~shrink-swell (very limited)	1.00	~excess fines (thickest layer)	1.00	~excess fines (bottom layer)	1.00	~too clayey (very limited)	1.00	~wetness (very limited)	1.00
	~low strength (very limited)	1.00	~excess fines (bottom layer)	1.00	~excess fines (thickest layer)	1.00	~wetness (very limited)	1.00	~too clayey (very limited)	1.00
	~wetness (very limited)	1.00							~cutbanks cave (slightly limited)	0.29

Table 12.--Construction Materials and Excavating--Continued

Map symbol and soil name	Source for roadfill: Rating class and limiting features	Value	Source for sand: Rating class and limiting features	Value	Source for gravel: Rating class and limiting features	Value	Source for topsoil: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value
18A:										
Perry----------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~shrink-swell (very limited)	1.00	~excess fines (thickest layer)	1.00	~excess fines (bottom layer)	1.00	~too clayey (very limited)	1.00	~wetness (very limited)	1.00
	~low strength (very limited)	1.00	~excess fines (bottom layer)	1.00	~excess fines (thickest layer)	1.00	~wetness (very limited)	1.00	~too clayey (very limited)	1.00
	~wetness (very limited)	1.00							~flooding (moderately limited)	0.60
19A:										
Portland-------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~low strength (very limited)	1.00	~excess fines (thickest layer)	1.00	~excess fines (bottom layer)	1.00	~too clayey (very limited)	1.00	~wetness (very limited)	1.00
	~shrink-swell (very limited)	1.00	~excess fines (bottom layer)	1.00	~excess fines (thickest layer)	1.00	~wetness (limited)	0.86	~too clayey (very limited)	1.00
	~wetness (limited)	0.86							~cutbanks cave (slightly limited)	0.29
20A:										
Portland-------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~low strength (very limited)	1.00	~excess fines (thickest layer)	1.00	~excess fines (bottom layer)	1.00	~too clayey (very limited)	1.00	~wetness (very limited)	1.00
	~shrink-swell (very limited)	1.00	~excess fines (bottom layer)	1.00	~excess fines (thickest layer)	1.00	~wetness (limited)	0.86	~too clayey (very limited)	1.00
	~wetness (limited)	0.86							~flooding (moderately limited)	0.60
21A, 21B:										
Rilla----------	Very limited		Very limited		Very limited		Slightly limited		Slightly limited	
	~low strength (very limited)	1.00	~excess fines (thickest layer)	1.00	~excess fines (bottom layer)	1.00	~too acid (slightly limited)	0.30	~cutbanks cave (slightly limited)	0.29
	~shrink-swell (slightly limited)	0.04	~excess fines (bottom layer)	1.00	~excess fines (thickest layer)	1.00	~too clayey (slightly limited)	0.25		
22:										
Riverwash------	Not rated		Not rated		Not rated		Not rated		Not rated	
23A, 23B:										
Stuttgart------	Very limited		Very limited		Very limited		Limited		Very limited	
	~low strength (very limited)	1.00	~excess fines (thickest layer)	1.00	~excess fines (bottom layer)	1.00	~wetness (limited)	0.86	~wetness (very limited)	1.00
	~wetness (limited)	0.86	~excess fines (bottom layer)	1.00	~excess fines (thickest layer)	1.00	~too clayey (slightly limited)	0.17	~too clayey (moderately limited)	0.45
	~shrink-swell (moderately limited)	0.58							~cutbanks cave (slightly limited)	0.29

Table 12.--Construction Materials and Excavating--Continued

Map symbol and soil name	Source for roadfill: Rating class and limiting features	Value	Source for sand: Rating class and limiting features	Value	Source for gravel: Rating class and limiting features	Value	Source for topsoil: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value
24A:										
Tichnor--------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~excess fines (thickest layer)	1.00	~excess fines (bottom layer)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
	~low strength (very limited)	1.00	~excess fines (bottom layer)	1.00	~excess fines (thickest layer)	1.00	~too acid (moderately limited)	0.42	~flooding (moderately limited)	0.60
									~cutbanks cave (slightly limited)	0.29
25A:										
Tichnor--------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~excess fines (thickest layer)	1.00	~excess fines (bottom layer)	1.00	~wetness (very limited)	1.00	~ponded (wetness) (very limited)	1.00
	~low strength (very limited)	1.00	~excess fines (bottom layer)	1.00	~excess fines (thickest layer)	1.00	~too acid (moderately limited)	0.42	~wetness (very limited)	1.00
									~flooding (moderately limited)	0.60
26C:										
Udipsamments---	Not limited		Possible source		Very limited		Very limited		Very limited	
			~excess fines (thickest layer)	1.00	~excess fines (bottom layer)	1.00	~too sandy (very limited)	1.00	~cutbanks cave (very limited)	1.00
			~possible source (bottom layer)	0.50	~excess fines (thickest layer)	1.00			~wetness (slightly limited)	0.24
27:										
Water----------	Not rated		Not rated		Not rated		Not rated		Not rated	
28B:										
Yancopin-------	Very limited		Very limited		Very limited		Slightly limited		Limited	
	~low strength (very limited)	1.00	~excess fines (thickest layer)	1.00	~excess fines (bottom layer)	1.00	~too clayey (slightly limited)	0.29	~wetness (limited)	0.99
	~shrink-swell (moderately limited)	0.45	~excess fines (bottom layer)	1.00	~excess fines (thickest layer)	1.00	~wetness (slightly limited)	0.03	~flooding (moderately limited)	0.60
	~wetness (slightly limited)	0.03							~cutbanks cave (slightly limited)	0.29
29A:										
Yorktown-------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~shrink-swell (very limited)	1.00	~excess fines (thickest layer)	1.00	~excess fines (bottom layer)	1.00	~wetness (very limited)	1.00	~ponded (wetness) (very limited)	1.00
	~low strength (very limited)	1.00	~excess fines (bottom layer)	1.00	~excess fines (thickest layer)	1.00	~too clayey (very limited)	1.00	~wetness (very limited)	1.00
	~wetness (very limited)	1.00							~too clayey (very limited)	1.00

Table 12.--Construction Materials and Excavating--Continued

Map symbol and soil name	Source for roadfill: Rating class and limiting features	Value	Source for sand: Rating class and limiting features	Value	Source for gravel: Rating class and limiting features	Value	Source for topsoil: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value
DAM:										
Dam------------	Not rated		Not rated		Not rated		Not rated		Not rated	
LVS:										
Levee----------	Not rated		Not rated		Not rated		Not rated		Not rated	

Table 13.--Water Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pond reservoir areas: Rating class and limiting features	Value	Drainage: Rating class and limiting features	Value	Irrigation: Rating class and limiting features	Value	Terraces and diversions: Rating class and limiting features	Value	Grassed waterways: Rating class and limiting features	Value
1C: Crevasse-------	Very limited ~seepage (very limited)	 1.00	Limited ~cutbanks cave (limited ~flooding (moderately limited) ~slope (slightly limited)	 0.90 0.60 0.02	Very limited ~droughty (very limited) ~fast intake (limited ~flooding (moderately limited)	 1.00 0.90 0.60	Very limited ~too sandy (very limited)	 1.00	Very limited ~droughty (very limited)	 1.00
2B: Desha----------	Not limited		Very limited ~percs slowly (very limited) ~flooding (moderately limited)	 1.00 0.60	Very limited ~percs slowly (very limited) ~slow intake (limited) ~flooding (moderately limited)	 1.00 0.79 0.60	Very limited ~wetness (very limited) ~erodes easily (moderately limited)	 1.00 0.60	Very limited ~wetness (very limited) ~erodes easily (moderately limited)	 1.00 0.60
3A: Dewitt---------	Moderately limited ~seepage (moderately limited)	 0.50	Moderately limited ~percs slowly (moderately limited)	 0.39	Moderately limited ~erodes easily (moderately limited) ~percs slowly (moderately limited)	 0.60 0.39	Very limited ~wetness (very limited) ~erodes easily (moderately limited)	 1.00 0.60	Very limited ~wetness (very limited) ~erodes easily (moderately limited)	 1.00 0.60
4B: Dubbs----------	Very limited ~seepage (very limited)	 1.00	Limited ~cutbanks cave (limited	 0.90	Moderately limited ~erodes easily (moderately limited)	 0.60	Moderately limited ~erodes easily (moderately limited)	 0.60	Moderately limited ~erodes easily (moderately limited)	 0.60
5B: Dundee---------	Moderately limited ~seepage (moderately limited)	 0.50	Moderately limited ~flooding (moderately limited) ~percs slowly (slightly limited)	 0.60 0.17	Moderately limited ~flooding (moderately limited) ~erodes easily (moderately limited) ~percs slowly (slightly limited)	 0.60 0.60 0.17	Moderately limited ~erodes easily (moderately limited) ~wetness (slightly limited)	 0.60 0.28	Moderately limited ~erodes easily (moderately limited) ~wetness (slightly limited)	 0.60 0.28

Table 13.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas: Rating class and limiting features	Value	Drainage: Rating class and limiting features	Value	Irrigation: Rating class and limiting features	Value	Terraces and diversions: Rating class and limiting features	Value	Grassed waterways: Rating class and limiting features	Value
6A:										
Ethel----------	Moderately limited		Slightly limited		Moderately limited		Very limited		Very limited	
	~seepage (moderately limited)	0.50	~percs slowly (slightly limited)	0.17	~erodes easily (moderately limited)	0.60	~wetness (very limited)	1.00	~wetness (very limited)	1.00
					~percs slowly (slightly limited)	0.17	~erodes easily (moderately limited)	0.60	~erodes easily (moderately limited)	0.60
7A:										
Forestdale-----	Not limited		Very limited		Very limited		Limited		Limited	
			~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~wetness (limited)	0.81	~wetness (limited)	0.81
			~flooding (limited)	0.90	~flooding (limited)	0.90	~erodes easily (moderately limited)	0.60	~erodes easily (moderately limited)	0.60
					~erodes easily (moderately limited)	0.60				
8A:										
Hebert---------	Moderately limited		Slightly limited		Moderately limited		Moderately limited		Moderately limited	
	~seepage (moderately limited)	0.50	~percs slowly (slightly limited)	0.17	~erodes easily (moderately limited)	0.60	~erodes easily (moderately limited)	0.60	~erodes easily (moderately limited)	0.60
					~percs slowly (slightly limited)	0.17	~wetness (moderately limited)	0.36	~wetness (moderately limited)	0.36
9A, 9B:										
Immanuel-------	Very limited		Slightly limited		Moderately limited		Moderately limited		Moderately limited	
	~seepage (very limited)	1.00	~percs slowly (slightly limited)	0.17	~erodes easily (moderately limited)	0.60	~erodes easily (moderately limited)	0.60	~erodes easily (moderately limited)	0.60
					~percs slowly (slightly limited)	0.17	~wetness (moderately limited)	0.44	~wetness (moderately limited)	0.44
9C:										
Immanuel-------	Very limited		Limited		Limited		Moderately limited		Moderately limited	
	~seepage (very limited)	1.00	~slope (limited)	0.90	~slope (limited)	0.90	~erodes easily (moderately limited)	0.60	~erodes easily (moderately limited)	0.60
	~slope (slightly limited)	0.25	~percs slowly (slightly limited)	0.17	~erodes easily (moderately limited)	0.60	~wetness (moderately limited)	0.44	~wetness (moderately limited)	0.44
					~percs slowly (slightly limited)	0.17	~slope (slightly limited)	0.25	~slope (slightly limited)	0.25
9D:										
Immanuel-------	Very limited		Very limited		Very limited		Limited		Limited	
	~seepage (very limited)	1.00	~slope (very limited)	1.00	~slope (very limited)	1.00	~slope (limited)	0.94	~slope (limited)	0.94
	~slope (limited)	0.94	~percs slowly (slightly limited)	0.17	~erodes easily (moderately limited)	0.60	~erodes easily (moderately limited)	0.60	~erodes easily (moderately limited)	0.60
					~percs slowly (slightly limited)	0.17	~wetness (moderately limited)	0.44	~wetness (moderately limited)	0.44

Table 13.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas: Rating class and limiting features	Value	Drainage: Rating class and limiting features	Value	Irrigation: Rating class and limiting features	Value	Terraces and diversions: Rating class and limiting features	Value	Grassed waterways: Rating class and limiting features	Value
9E:										
Immanuel	Very limited		Very limited		Very limited		Very limited		Very limited	
	~slope (very limited)	1.00	~slope (very limited)	1.00	~slope (very limited)	1.00	~slope (very limited)	1.00	~slope (very limited)	1.00
	~seepage (very limited)	1.00	~percs slowly (slightly limited)	0.17	~erodes easily (moderately limited)	0.60	~erodes easily (moderately limited)	0.60	~erodes easily (moderately limited)	0.60
					~percs slowly (slightly limited)	0.17	~wetness (moderately limited)	0.44	~wetness (moderately limited)	0.44
10A:										
Keo	Very limited		Moderately limited		Moderately limited		Moderately limited		Moderately limited	
	~seepage (very limited)	1.00	~flooding (moderately limited)	0.60	~flooding (moderately limited)	0.60	~erodes easily (moderately limited)	0.60	~erodes easily (moderately limited)	0.60
					~erodes easily (moderately limited)	0.60				
10C:										
Keo	Very limited		Moderately limited		Moderately limited		Moderately limited		Moderately limited	
	~seepage (very limited)	1.00	~flooding (moderately limited)	0.60	~flooding (moderately limited)	0.60	~erodes easily (moderately limited)	0.60	~erodes easily (moderately limited)	0.60
	~slope (slightly limited)	0.05	~slope (slightly limited)	0.22	~erodes easily (moderately limited)	0.60	~slope (slightly limited)	0.05	~slope (slightly limited)	0.05
					~slope (slightly limited)	0.22				
11A:										
Kobel	Not limited		Very limited		Very limited		Very limited		Very limited	
			~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
			~flooding (limited)	0.90	~flooding (limited)	0.90	~erodes easily (moderately limited)	0.60	~erodes easily (moderately limited)	0.60
					~slow intake (limited)	0.70				
12A:										
Kobel	Not limited		Very limited		Very limited		Very limited		Very limited	
			~ponded (wetness) (very limited)	1.00	~ponded (wetness) (very limited)	1.00	~ponded (wetness) (very limited)	1.00	~wetness (very limited)	1.00
			~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~wetness (very limited)	1.00	~erodes easily (moderately limited)	0.60
			~flooding (limited)	0.90	~flooding (limited)	0.90	~erodes easily (moderately limited)	0.60		

Table 13.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas: Rating class and limiting features	Value	Drainage: Rating class and limiting features	Value	Irrigation: Rating class and limiting features	Value	Terraces and diversions: Rating class and limiting features	Value	Grassed waterways: Rating class and limiting features	Value
13A: Lagrue---------	Not limited		Very limited ~percs slowly (very limited)	 1.00	Very limited ~percs slowly (very limited) ~erodes easily (moderately limited) ~slow intake (moderately limited)	 1.00 0.60 0.60	Very limited ~wetness (very limited) ~erodes easily (moderately limited)	 1.00 0.60	Very limited ~wetness (very limited) ~erodes easily (moderately limited)	 1.00 0.60
14B: Muskogee-------	Not limited		Moderately limited ~percs slowly (moderately limited)	 0.39	Moderately limited ~erodes easily (moderately limited) ~percs slowly (moderately limited)	 0.60 0.39	Moderately limited ~erodes easily (moderately limited) ~wetness (moderately limited)	 0.60 0.60	Moderately limited ~erodes easily (moderately limited) ~wetness (moderately limited)	 0.60 0.60
14C: Muskogee-------	Slightly limited ~slope (slightly limited)	 0.25	Limited ~slope (limited) ~percs slowly (moderately limited)	 0.90 0.39	Limited ~slope (limited) ~erodes easily (moderately limited) ~percs slowly (moderately limited)	 0.90 0.60 0.39	Moderately limited ~erodes easily (moderately limited) ~wetness (moderately limited) ~slope (slightly limited)	 0.60 0.60 0.25	Moderately limited ~erodes easily (moderately limited) ~wetness (moderately limited) ~slope (slightly limited)	 0.60 0.60 0.25
14D: Muskogee-------	Limited ~slope (limited)	 0.94	Very limited ~slope (very limited) ~percs slowly (moderately limited)	 1.00 0.39	Very limited ~slope (very limited) ~erodes easily (moderately limited) ~percs slowly (moderately limited)	 1.00 0.60 0.39	Limited ~slope (limited) ~erodes easily (moderately limited) ~wetness (moderately limited)	 0.94 0.60 0.60	Limited ~slope (limited) ~erodes easily (moderately limited) ~wetness (moderately limited)	 0.94 0.60 0.60
15A: Oaklimeter-----	Moderately limited ~seepage (moderately limited)	 0.50	Moderately limited ~flooding (moderately limited)	 0.60	Moderately limited ~flooding (moderately limited) ~erodes easily (moderately limited)	 0.60 0.60	Moderately limited ~erodes easily (moderately limited) ~wetness (moderately limited)	 0.60 0.44	Moderately limited ~erodes easily (moderately limited) ~wetness (moderately limited)	 0.60 0.44
16A: Overcup--------	Not limited		Very limited ~percs slowly (very limited)	 1.00	Very limited ~percs slowly (very limited) ~erodes easily (moderately limited)	 1.00 0.60	Very limited ~wetness (very limited) ~erodes easily (moderately limited)	 1.00 0.60	Very limited ~wetness (very limited) ~erodes easily (moderately limited)	 1.00 0.60

Table 13.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas: Rating class and limiting features	Value	Drainage: Rating class and limiting features	Value	Irrigation: Rating class and limiting features	Value	Terraces and diversions: Rating class and limiting features	Value	Grassed waterways: Rating class and limiting features	Value
17A:										
Perry	Not limited		Very limited		Very limited		Very limited		Very limited	
			~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
					~slow intake (limited)	0.99				
18A:										
Perry	Not limited		Very limited		Very limited		Very limited		Very limited	
			~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
			~flooding (limited)	0.90	~slow intake (limited)	0.99				
					~flooding (limited)	0.90				
19A:										
Portland	Slightly limited		Very limited		Very limited		Moderately limited		Moderately limited	
	~seepage (slightly limited)	0.18	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~wetness (moderately limited)	0.60	~wetness (moderately limited)	0.60
					~slow intake (limited)	0.79				
20A:										
Portland	Slightly limited		Very limited		Very limited		Moderately limited		Moderately limited	
	~seepage (slightly limited)	0.18	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~wetness (moderately limited)	0.60	~wetness (moderately limited)	0.60
			~flooding (limited)	0.90	~flooding (limited)	0.90				
					~slow intake (limited)	0.79				
21A, 21B:										
Rilla	Moderately limited		Not limited		Moderately limited		Moderately limited		Moderately limited	
	~seepage (moderately limited)	0.50			~erodes easily (moderately limited)	0.60	~erodes easily (moderately limited)	0.60	~erodes easily (moderately limited)	0.60
22:										
Riverwash	Not rated		Not rated		Not rated		Not rated		Not rated	
23A, 23B:										
Stuttgart	Not limited		Very limited		Very limited		Moderately limited		Moderately limited	
			~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~erodes easily (moderately limited)	0.60	~erodes easily (moderately limited)	0.60
					~erodes easily (moderately limited)	0.60	~wetness (moderately limited)	0.60	~wetness (moderately limited)	0.60

Table 13.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas: Rating class and limiting features	Value	Drainage: Rating class and limiting features	Value	Irrigation: Rating class and limiting features	Value	Terraces and diversions: Rating class and limiting features	Value	Grassed waterways: Rating class and limiting features	Value
24A:										
Tichnor	Moderately limited		Limited		Limited		Very limited		Very limited	
	~seepage (moderately limited)	0.50	~flooding (limited)	0.90	~flooding (limited)	0.90	~wetness (very limited)	1.00	~wetness (very limited)	1.00
			~percs slowly (slightly limited)	0.17	~erodes easily (moderately limited)	0.60	~erodes easily (moderately limited)	0.60	~erodes easily (moderately limited)	0.60
					~percs slowly (slightly limited)	0.17				
25A:										
Tichnor	Moderately limited		Very limited		Very limited		Very limited		Very limited	
	~seepage (moderately limited)	0.50	~ponded (wetness) (very limited)	1.00	~ponded (wetness) (very limited)	1.00	~ponded (wetness) (very limited)	1.00	~wetness (very limited)	1.00
			~flooding (limited)	0.90	~flooding (limited)	0.90	~wetness (very limited)	1.00	~erodes easily (moderately limited)	0.60
			~percs slowly (slightly limited)	0.17	~erodes easily (moderately limited)	0.60	~erodes easily (moderately limited)	0.60		
26C:										
Udipsamments	Very limited		Slightly limited		Very limited		Very limited		Very limited	
	~seepage (very limited)	1.00	~slope (slightly limited)	0.10	~droughty (very limited)	1.00	~too sandy (very limited)	1.00	~droughty (very limited)	1.00
					~fast intake (limited	0.90				
					~slope (slightly limited)	0.10				
27:										
Water	Not rated		Not rated		Not rated		Not rated		Not rated	
28B:										
Yancopin	Moderately limited		Limited		Limited		Moderately limited		Moderately limited	
	~seepage (moderately limited)	0.32	~flooding (limited)	0.90	~flooding (limited)	0.90	~erodes easily (moderately limited)	0.60	~erodes easily (moderately limited)	0.60
			~percs slowly (slightly limited)	0.17	~erodes easily (moderately limited)	0.60	~wetness (slightly limited)	0.13	~wetness (slightly limited)	0.13
					~slow intake (moderately limited)	0.60				
29A:										
Yorktown	Not limited		Very limited		Very limited		Very limited		Very limited	
			~ponded (wetness) (very limited)	1.00	~ponded (wetness) (very limited)	1.00	~ponded (wetness) (very limited)	1.00	~wetness (very limited)	1.00
			~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~wetness (very limited)	1.00		
			~flooding (limited)	0.90	~flooding (limited)	0.90				

Table 13.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas		Drainage		Irrigation		Terraces and diversions		Grassed waterways	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
DAM:										
Dam	Not rated		Not rated		Not rated		Not rated		Not rated	
LVS:										
Levee	Not rated		Not rated		Not rated		Not rated		Not rated	

Table 14.--Waste Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Land application of manure and food processing waste: Rating class and limiting features	Value	Land application of municipal sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value	Treatment of wastewater by slow rate process: Rating class and limiting features	Value	Treatment of wastewater by rapid infiltration process: Rating class and limiting features	Value
1C:										
Crevasse-------	Very limited		Very limited		Very limited		Very limited		Limited	
	~droughty (very limited)	1.00	~droughty (very limited)	1.00	~droughty (very limited)	1.00	~poor filter (very limited)	1.00	~flooding (moderately limited)	0.60
	~poor filter (very limited)	1.00	~poor filter (very limited)	1.00	~poor filter (very limited)	1.00	~flooding (limited)	0.90	~slope (slightly limited)	0.02
	~flooding (limited)	0.90	~flooding (limited)	0.90	~flooding (limited)	0.90				
2B:										
Desha----------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00
	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
	~flooding (limited)	0.90	~flooding (limited)	0.90	~flooding (limited)	0.90	~flooding (limited)	0.90	~flooding (moderately limited)	0.60
3A:										
Dewitt---------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~percs slowly (very limited)	1.00
	~too acid (slightly limited)	0.12	~too acid (slightly limited)	0.12	~too acid (slightly limited)	0.12	~too acid (slightly limited)	0.12	~wetness (very limited)	1.00
4B:										
Dubbs----------	Slightly limited		Slightly limited		Slightly limited		Slightly limited		Very limited	
	~too acid (slightly limited)	0.12	~too acid (slightly limited)	0.12	~too acid (slightly limited)	0.12	~too acid (slightly limited)	0.12	~percs slowly (very limited)	1.00
5B:										
Dundee---------	Limited		Limited		Limited		Limited		Very limited	
	~flooding (limited)	0.90	~flooding (limited)	0.90	~flooding (limited)	0.90	~flooding (limited)	0.90	~percs slowly (very limited)	1.00
	~percs slowly (limited)	0.60	~percs slowly (limited)	0.60	~percs slowly (limited)	0.60	~percs slowly (limited)	0.60	~wetness (very limited)	1.00
	~wetness (slightly limited)	0.28	~wetness (slightly limited)	0.28	~wetness (slightly limited)	0.28	~wetness (slightly limited)	0.28	~flooding (moderately limited)	0.60

Table 14.--Waste Management--Continued

Map symbol and soil name	Land application of manure and food processing waste: Rating class and limiting features	Value	Land application of municipal sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value	Treatment of wastewater by slow rate process: Rating class and limiting features	Value	Treatment of wastewater by rapid infiltration process: Rating class and limiting features	Value
6A: Ethel----------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~percs slowly (very limited)	1.00
	~percs slowly (limited)	0.60	~percs slowly (limited)	0.60	~percs slowly (limited)	0.60	~percs slowly (limited)	0.60	~wetness (very limited)	1.00
7A: Forestdale-----	Very limited		Very limited		Very limited		Very limited		Very limited	
	~flooding (very limited)	1.00	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~flooding (very limited)	1.00	~percs slowly (very limited)	1.00
	~percs slowly (very limited)	1.00	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~percs slowly (very limited)	1.00	~wetness (very limited)	1.00
	~wetness (limited)	0.81	~wetness (limited)	0.81	~wetness (limited)	0.81	~wetness (limited)	0.81	~flooding (very limited)	1.00
8A: Hebert---------	Limited		Limited		Limited		Limited		Very limited	
	~percs slowly (limited)	0.60	~percs slowly (limited)	0.60	~percs slowly (limited)	0.60	~percs slowly (limited)	0.60	~percs slowly (very limited)	1.00
	~wetness (moderately limited)	0.36	~wetness (moderately limited)	0.36	~wetness (moderately limited)	0.36	~wetness (moderately limited)	0.36	~wetness (very limited)	1.00
9A, 9B: Immanuel-------	Limited		Limited		Limited		Limited		Very limited	
	~percs slowly (limited)	0.60	~percs slowly (limited)	0.60	~percs slowly (limited)	0.60	~percs slowly (limited)	0.60	~percs slowly (very limited)	1.00
	~wetness (moderately limited)	0.44	~wetness (moderately limited)	0.44	~wetness (moderately limited)	0.44	~wetness (moderately limited)	0.44	~wetness (very limited)	1.00
9C: Immanuel-------	Limited		Limited		Limited		Limited		Very limited	
	~percs slowly (limited)	0.60	~percs slowly (limited)	0.60	~percs slowly (limited)	0.60	~percs slowly (limited)	0.60	~percs slowly (very limited)	1.00
	~wetness (moderately limited)	0.44	~wetness (moderately limited)	0.44	~wetness (moderately limited)	0.44	~wetness (moderately limited)	0.44	~wetness (very limited)	1.00
					~slope (slightly limited)	0.25	~slope (slightly limited)	0.25	~slope (limited)	0.80
9D: Immanuel-------	Limited		Limited		Limited		Limited		Very limited	
	~slope (limited)	0.72	~slope (limited)	0.72	~slope (limited)	0.94	~slope (limited)	0.94	~percs slowly (very limited)	1.00
	~percs slowly (limited)	0.60	~percs slowly (limited)	0.60	~percs slowly (limited)	0.60	~percs slowly (limited)	0.60	~slope (very limited)	1.00
	~wetness (moderately limited)	0.44	~wetness (moderately limited)	0.44	~wetness (moderately limited)	0.44	~wetness (moderately limited)	0.44	~wetness (very limited)	1.00

Table 14.--Waste Management--Continued

Map symbol and soil name	Land application of manure and food processing waste: Rating class and limiting features	Value	Land application of municipal sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value	Treatment of wastewater by slow rate process: Rating class and limiting features	Value	Treatment of wastewater by rapid infiltration process: Rating class and limiting features	Value
9E:										
Immanuel-------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~slope (very limited)	1.00	~slope (very limited)	1.00	~slope (very limited)	1.00	~slope (very limited)	1.00	~percs slowly (very limited)	1.00
	~percs slowly (limited)	0.60	~percs slowly (limited)	0.60	~percs slowly (limited)	0.60	~percs slowly (limited)	0.60	~slope (very limited)	1.00
	~wetness (moderately limited)	0.44	~wetness (moderately limited)	0.44	~wetness (moderately limited)	0.44	~wetness (moderately limited)	0.44	~wetness (very limited)	1.00
10A:										
Keo------------	Limited		Limited		Limited		Limited		Very limited	
	~flooding (limited)	0.90	~flooding (limited)	0.90	~flooding (limited)	0.90	~flooding (limited)	0.90	~percs slowly (very limited)	1.00
									~flooding (moderately limited)	0.60
10C:										
Keo------------	Limited		Limited		Limited		Limited		Very limited	
	~flooding (limited)	0.90	~flooding (limited)	0.90	~flooding (limited)	0.90	~flooding (limited)	0.90	~percs slowly (very limited)	1.00
					~slope (slightly limited)	0.05	~slope (slightly limited)	0.05	~flooding (moderately limited)	0.60
									~slope (slightly limited)	0.17
11A:										
Kobel----------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~percs slowly (very limited)	1.00	~flooding (very limited)	1.00	~percs slowly (very limited)	1.00
	~flooding (very limited)	1.00	~percs slowly (very limited)	1.00	~wetness (very limited)	1.00	~percs slowly (very limited)	1.00	~wetness (very limited)	1.00
	~percs slowly (very limited)	1.00	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~wetness (very limited)	1.00	~flooding (very limited)	1.00
12A:										
Kobel----------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~percs slowly (very limited)	1.00	~flooding (very limited)	1.00	~percs slowly (very limited)	1.00
	~flooding (very limited)	1.00	~percs slowly (very limited)	1.00	~ponded (wetness) (very limited)	1.00	~percs slowly (very limited)	1.00	~ponded (wetness) (very limited)	1.00
	~ponded (wetness) (very limited)	1.00	~ponded (wetness) (very limited)	1.00	~wetness (very limited)	1.00	~ponded (wetness) (very limited)	1.00	~wetness (very limited)	1.00

Table 14.--Waste Management--Continued

Map symbol and soil name	Land application of manure and food processing waste: Rating class and limiting features	Value	Land application of municipal sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value	Treatment of wastewater by slow rate process: Rating class and limiting features	Value	Treatment of wastewater by rapid infiltration process: Rating class and limiting features	Value
13A:										
Lagrue---------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00
	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
									~too acid (slightly limited)	0.03
14B:										
Muskogee-------	Limited		Limited		Limited		Limited		Very limited	
	~percs slowly (limited)	0.60	~percs slowly (limited)	0.60	~percs slowly (limited)	0.60	~percs slowly (limited)	0.60	~percs slowly (very limited)	1.00
	~wetness (moderately limited)	0.60	~wetness (moderately limited)	0.60	~wetness (moderately limited)	0.60	~wetness (moderately limited)	0.60	~wetness (very limited)	1.00
14C:										
Muskogee-------	Limited		Limited		Limited		Limited		Very limited	
	~percs slowly (limited)	0.60	~percs slowly (limited)	0.60	~percs slowly (limited)	0.60	~percs slowly (limited)	0.60	~percs slowly (very limited)	1.00
	~wetness (moderately limited)	0.60	~wetness (moderately limited)	0.60	~wetness (moderately limited)	0.60	~wetness (moderately limited)	0.60	~wetness (very limited)	1.00
					~slope (slightly limited)	0.25	~slope (slightly limited)	0.25	~slope (limited)	0.80
14D:										
Muskogee-------	Limited		Limited		Limited		Limited		Very limited	
	~slope (limited)	0.72	~slope (limited)	0.72	~slope (limited)	0.94	~slope (limited)	0.94	~percs slowly (very limited)	1.00
	~percs slowly (limited)	0.60	~percs slowly (limited)	0.60	~percs slowly (limited)	0.60	~percs slowly (limited)	0.60	~slope (very limited)	1.00
	~wetness (moderately limited)	0.60	~wetness (moderately limited)	0.60	~wetness (moderately limited)	0.60	~wetness (moderately limited)	0.60	~wetness (very limited)	1.00
15A:										
Oaklimeter-----	Limited		Limited		Limited		Limited		Very limited	
	~flooding (limited)	0.90	~flooding (limited)	0.90	~flooding (limited)	0.90	~flooding (limited)	0.90	~percs slowly (very limited)	1.00
	~wetness (moderately limited)	0.44	~wetness (moderately limited)	0.44	~wetness (moderately limited)	0.44	~wetness (moderately limited)	0.44	~wetness (very limited)	1.00
	~too acid (slightly limited)	0.12	~too acid (slightly limited)	0.12	~too acid (slightly limited)	0.12	~too acid (slightly limited)	0.12	~flooding (moderately limited)	0.60

Table 14.--Waste Management--Continued

Map symbol and soil name	Land application of manure and food processing waste: Rating class and limiting features	Value	Land application of municipal sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value	Treatment of wastewater by slow rate process: Rating class and limiting features	Value	Treatment of wastewater by rapid infiltration process: Rating class and limiting features	Value
16A:										
Overcup--------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00
	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
17A:										
Perry----------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00
	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
18A:										
Perry----------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~percs slowly (very limited)	1.00	~flooding (very limited)	1.00	~percs slowly (very limited)	1.00
	~flooding (very limited)	1.00	~percs slowly (very limited)	1.00	~wetness (very limited)	1.00	~percs slowly (very limited)	1.00	~wetness (very limited)	1.00
	~percs slowly (very limited)	1.00	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~wetness (very limited)	1.00	~flooding (very limited)	1.00
19A:										
Portland-------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00
	~wetness (moderately limited)	0.60	~wetness (moderately limited)	0.60	~wetness (moderately limited)	0.60	~wetness (moderately limited)	0.60	~wetness (very limited)	1.00
20A:										
Portland-------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~flooding (very limited)	1.00	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~flooding (very limited)	1.00	~percs slowly (very limited)	1.00
	~percs slowly (very limited)	1.00	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~percs slowly (very limited)	1.00	~wetness (very limited)	1.00
	~wetness (moderately limited)	0.60	~wetness (moderately limited)	0.60	~wetness (moderately limited)	0.60	~wetness (moderately limited)	0.60	~flooding (very limited)	1.00
21A, 21B:										
Rilla----------	Not limited		Not limited		Not limited		Not limited		Very limited	
									~percs slowly (very limited)	1.00
22:										
Riverwash------	Not rated		Not rated		Not rated		Not rated		Not rated	

Table 14.--Waste Management--Continued

Map symbol and soil name	Land application of manure and food processing waste: Rating class and limiting features	Value	Land application of municipal sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value	Treatment of wastewater by slow rate process: Rating class and limiting features	Value	Treatment of wastewater by rapid infiltration process: Rating class and limiting features	Value
23A, 23B:										
Stuttgart------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00	~percs slowly (very limited)	1.00
	~wetness (moderately limited)	0.60	~wetness (moderately limited)	0.60	~wetness (moderately limited)	0.60	~wetness (moderately limited)	0.60	~wetness (very limited)	1.00
24A:										
Tichnor--------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~flooding (very limited)	1.00	~percs slowly (very limited)	1.00
	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
	~too acid (moderately limited)	0.42	~too acid (moderately limited)	0.42	~too acid (moderately limited)	0.42	~too acid (moderately limited)	0.42	~flooding (very limited)	1.00
25A:										
Tichnor--------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~ponded (wetness) (very limited)	1.00	~flooding (very limited)	1.00	~percs slowly (very limited)	1.00
	~flooding (very limited)	1.00	~ponded (wetness) (very limited)	1.00	~wetness (very limited)	1.00	~ponded (wetness) (very limited)	1.00	~ponded (wetness) (very limited)	1.00
	~ponded (wetness) (very limited)	1.00	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~wetness (very limited)	1.00	~wetness (very limited)	1.00
26C:										
Udipsamments---	Very limited		Very limited		Very limited		Very limited		Limited	
	~droughty (very limited)	1.00	~droughty (very limited)	1.00	~droughty (very limited)	1.00	~poor filter (very limited)	1.00	~wetness (limited)	0.69
	~poor filter (very limited)	1.00	~poor filter (very limited)	1.00	~poor filter (very limited)	1.00			~slope (slightly limited)	0.08
27:										
Water----------	Not rated		Not rated		Not rated		Not rated		Not rated	
28B:										
Yancopin-------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~flooding (very limited)	1.00	~percs slowly (very limited)	1.00
	~percs slowly (limited)	0.60	~percs slowly (limited)	0.60	~percs slowly (limited)	0.60	~percs slowly (limited)	0.60	~wetness (very limited)	1.00
	~wetness (slightly limited)	0.13	~wetness (slightly limited)	0.13	~wetness (slightly limited)	0.13	~wetness (slightly limited)	0.13	~flooding (very limited)	1.00

Table 14.--Waste Management--Continued

Map symbol and soil name	Land application of manure and food processing waste: Rating class and limiting features	Value	Land application of municipal sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value	Treatment of wastewater by slow rate process: Rating class and limiting features	Value	Treatment of wastewater by rapid infiltration process: Rating class and limiting features	Value
29A:										
Yorktown-------	Very limited		Very limited		Very limited		Very limited		Very limited	
	~wetness (very limited)	1.00	~wetness (very limited)	1.00	~percs slowly (very limited)	1.00	~flooding (very limited)	1.00	~percs slowly (very limited)	1.00
	~flooding (very limited)	1.00	~percs slowly (very limited)	1.00	~ponded (wetness) (very limited)	1.00	~percs slowly (very limited)	1.00	~ponded (wetness) (very limited)	1.00
	~ponded (wetness) (very limited)	1.00	~ponded (wetness) (very limited)	1.00	~wetness (very limited)	1.00	~ponded (wetness) (very limited)	1.00	~wetness (very limited)	1.00
DAM:										
Dam------------	Not rated		Not rated		Not rated		Not rated		Not rated	
LVS:										
Levee----------	Not rated		Not rated		Not rated		Not rated		Not rated	

Soil Properties

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

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics.

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 the tables. They include engineering index properties, physical and chemical properties, and pertinent soil and water features.

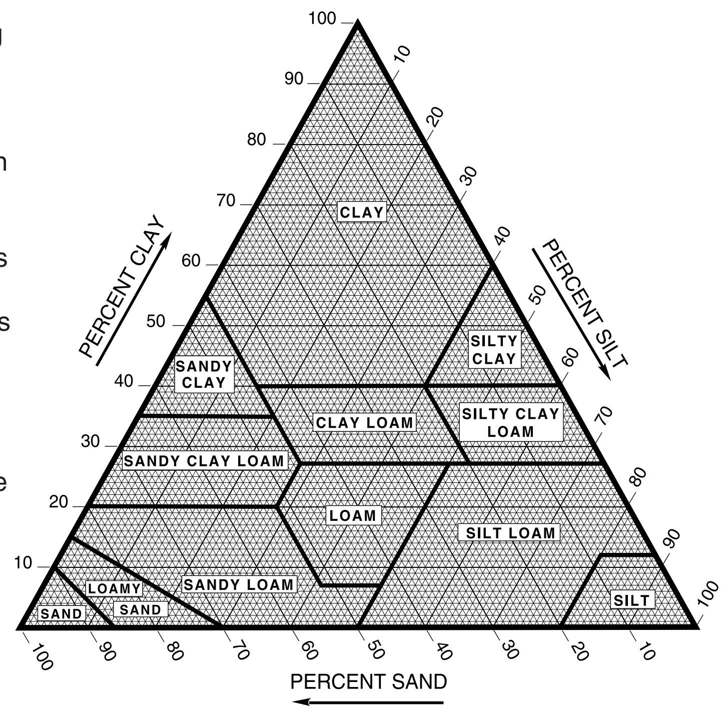

Figure 2.—Percentages of clay, silt, and sand in the basic USDA soil textural classes.

Engineering Index Properties

Table 15 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under the heading “Soil Series and Their Morphology.”

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter (fig. 2). “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 as much as about 15 percent, 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 (ASTM, 2001) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2000).

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

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

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

Rock fragments larger than 3 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

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

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

Physical and Chemical Properties

Table 16 shows estimates of some physical and 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.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In the table, 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 micrometers per second (um/sec), 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.

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.

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.

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 the table, 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 the table 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 six 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 coarse 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.

Soil and Water Features

Table 17 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are 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, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

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

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

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a 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.

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. The table 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. The table 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).

Flooding, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt 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.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

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

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

Physical Analysis of Selected Soils

The results of physical analysis of several typical pedons in the survey area are given in table 18. The data are for soils sampled at carefully selected sites. The pedons are typical of the series and are described in the section “Soil Series and Their Morphology.” Soil samples were analyzed by the Soil Characterization Laboratory, University of Arkansas at Fayetteville.

Table 15.--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 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
1C:											
Crevasse------	0-4	Loamy fine sand	SM	A-4, A-2-4	0	100	100	70-85	30-45	12-18	1-4
	4-72	Sand, loamy sand, loamy fine sand	SM, SW-SM	A-2-4, A-4	0	100	100	50-85	5-45	9-14	NP-2
2B:											
Desha---------	0-9	Silty clay	CH	A-7-6	0	100	100	95-100	90-95	56-76	33-49
	9-54	Clay	CH	A-7	0	100	100	90-100	75-95	76-96	49-65
	54-80	Clay, silty clay	CH	A-7-6	0	100	100	90-100	75-95	56-91	33-61
3A:											
Dewitt--------	0-7	Silt loam	CL	A-6	0	100	100	90-100	70-90	26-43	9-23
	7-22	Silt loam, silt	CL	A-6	0	100	100	90-100	70-100	24-38	7-19
	22-80	Silty clay loam, silty clay	CH, CL	A-7-6	0	100	100	95-100	85-95	43-66	23-41
4B:											
Dubbs---------	0-5	Silt loam	CL, CL-ML, ML	A-4	0	100	100	90-100	70-90	15-30	1-9
	5-44	Silty clay loam, clay loam	CL	A-6, A-7-6	0	100	100	90-100	70-95	35-45	16-22
	44-58	Loam, silt loam, very fine sandy loam	CL, CL-ML	A-4, A-6	0	100	100	85-100	50-90	20-35	4-15
	58-80	Loamy sand, loamy fine sand, loamy very fine sand, fine sandy loam, sandy loam	CL, CL-ML, ML, SC-SM, SM, SC	A-4, A-2-4	0	100	100	50-95	15-60	15-30	1-11
5B:											
Dundee--------	0-4	Silt loam	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-90	21-36	4-16
	4-10	Silty clay loam, silt loam	CL	A-6, A-7-6	0	100	100	90-100	70-95	28-43	9-21
	10-30	Silty clay loam, silt loam	CL	A-6, A-7-6	0	100	100	90-100	70-95	28-43	9-21
	30-40	Silty clay loam, silt loam	CL	A-6, A-7-6	0	100	100	90-100	70-95	28-43	9-21
	40-60	Silt loam, loam	CL	A-6	0	100	100	85-100	60-90	28-35	9-15
	60-72	Loam, fine sandy loam, silt loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	100	100	70-100	40-90	21-35	4-15
6A:											
Ethel---------	0-5	Silt loam	CL	A-4, A-6	0	100	100	90-100	70-90	25-36	7-16
	5-24	Silt loam, silt	CL-ML, ML	A-4	0	100	100	90-100	70-100	19-26	2-8
	24-52	Silty clay loam, silt loam	CL	A-6, A-7-6	0	100	100	90-100	70-95	26-44	8-22
	52-80	Silt loam, silty clay loam	CL	A-6, A-7-6	0	100	100	90-100	70-95	30-44	11-22
7A:											
Forestdale----	0-5	Silty clay loam	CH, CL	A-7-6	0	100	100	95-100	85-95	43-54	23-31
	5-39	Silty clay, clay	CH	A-7-6	0	100	100	90-100	75-95	56-76	33-49
	39-80	Silty clay loam, silt loam	CL	A-6, A-7-6	0	100	100	90-100	70-95	26-51	9-29

Table 15.--Engineering Idex Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification Unified	Classification AASHTO	Fragments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
8A:											
Hebert--------	0-4	Silt loam	CL-ML, CL	A-4, A-6	0	100	100	90-100	70-90	21-36	4-16
	4-20	Silt loam, silty clay loam	CL	A-6, A-7-6, A-4	0	100	100	90-100	70-95	25-44	7-22
	20-50	Silt loam, silty clay loam	CL	A-6, A-7-6, A-4	0	100	100	90-100	70-95	25-44	7-22
	50-72	Very fine sandy loam, silty clay loam, silt loam	CL, CL-ML	A-4, A-6, A-7-6	0	100	100	85-100	50-95	21-44	4-22
9A, 9B, 9C, 9D, 9E:											
Immanuel-----	0-7	Silt loam	CL-ML, CL	A-4	0	100	100	90-100	70-90	23-26	6-8
	7-28	Silt loam, silty clay loam	CL	A-6	0	100	100	90-100	70-95	28-39	9-18
	28-33	Silt loam, silt	CL-ML, ML	A-4	0	100	100	90-100	70-100	19-26	2-8
	33-53	Silt loam, silty clay loam	CL	A-6	0	100	100	90-100	70-95	26-41	8-20
	53-80	Silt loam, silty clay loam	CL	A-6	0	100	100	95-100	70-95	26-41	8-20
10A, 10C:											
Keo-----------	0-5	Loam	CL-ML, ML, CL	A-4	0	100	100	85-95	60-75	18-30	2-11
	5-19	Very fine sandy loam, silt loam	CL, CL-ML	A-4, A-6	0	100	100	85-100	50-90	21-35	4-15
	19-39	Very fine sandy loam, silt loam	CL, CL-ML	A-4, A-6	0	100	100	85-100	50-90	21-35	4-15
	39-47	Silt loam, silty clay loam	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-95	19-39	2-18
	47-60	Silt loam, fine sandy loam, silty clay loam, loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	100	100	70-100	40-95	19-39	2-18
	60-80	Silt loam, fine sandy loam, silty clay loam, loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	100	100	70-100	40-95	19-39	2-18
11A, 12A:											
Kobel---------	0-5	Silty clay	CH	A-7-6	0	100	100	95-100	90-95	56-66	33-41
	5-40	Clay, silty clay	CH	A-7-6	0	100	100	90-100	75-95	56-71	33-45
	40-54	Clay, silty clay loam	CH, CL	A-7-6	0	100	100	90-100	75-95	46-66	25-41
	54-72	Clay, silty clay, silty clay loam	CH, CL	A-7-6	0	100	100	90-100	75-95	46-66	25-41
13A:											
Lagrue--------	0-4	Silty clay loam	CL, CH	A-7-6	0	100	100	95-100	85-95	43-56	23-33
	4-11	Silty clay, clay, silty clay loam	CH	A-7-6	0	100	100	90-100	75-95	51-71	29-45
	11-80	Silty clay, clay, silty clay loam	CH	A-7-6	0	100	100	90-100	75-95	51-71	29-45
14B, 14C, 14D:											
Muskogee------	0-5	Silt loam	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-90	21-36	4-16
	5-10	Silty clay loam	CL	A-6, A-7-6	0	100	100	95-100	85-95	36-48	16-25
	10-60	Silty clay, clay	CH	A-7-6	0	100	100	90-100	75-95	48-62	25-36
	60-90	Silty clay, clay	CH	A-7-6	0	100	100	90-100	75-95	48-62	25-36

Table 15.--Engineering Idex Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
15A:											
Oaklimeter----	0-8	Silt loam	CL-ML	A-4	0	100	100	90-100	70-90	21-26	4-8
	8-40	Very fine sandy loam, silt loam, loam	CL, CL-ML, ML	A-4	0	100	100	85-100	50-90	18-28	2-9
	40-55	Silt loam, loam	CL, CL-ML, ML	A-4, A-6	0	100	100	85-100	60-90	18-36	2-16
	55-72	Silt loam, silty clay loam	CL, CL-ML, ML	A-4, A-6	0	100	100	90-100	70-95	18-39	2-18
16A:											
Overcup-------	0-8	Silt loam	CL	A-7-6, A-6	0	100	100	90-100	70-90	28-43	11-23
	8-14	Silt loam	CL	A-4, A-6, A-7-6	0	100	100	90-100	70-90	24-43	7-23
	14-40	Silty clay, clay	CH	A-7-6	0	100	100	90-100	75-95	56-71	33-45
	40-60	Silty clay, clay	CH	A-7-6	0	100	100	90-100	75-95	56-71	33-45
	60-72	Silty clay, silty clay loam	CH, CL	A-7-6	0	100	100	95-100	85-95	43-66	23-41
17A, 18A:											
Perry---------	0-4	Clay	CH	A-7	0	100	100	90-100	75-95	56-96	33-65
	4-36	Clay	CH	A-7	0	100	100	90-100	75-95	71-101	45-69
	36-80	Clay	CH	A-7	0	100	100	90-100	75-95	71-101	45-69
19A, 20A:											
Portland------	0-4	Clay	CH	A-7-6	0	100	100	90-100	75-95	48-66	25-39
	4-30	Clay	CH	A-7	0	100	100	90-100	75-95	66-89	39-57
	30-50	Clay, silty clay	CH	A-7	0	100	100	90-100	75-95	62-89	36-57
	50-80	Silty clay, clay, silt loam, clay loam	CH, CL	A-7-6	0	100	100	90-100	50-95	26-66	8-39
21A, 21B:											
Rilla---------	0-5	Silt loam	CL, CL-ML, ML	A-4, A-6	0	100	100	90-100	70-90	19-36	2-16
	5-35	Silty clay loam, loam, silt loam	CL	A-7-6, A-6	0	100	100	85-100	60-95	28-44	9-22
	35-55	Loam, silty clay loam, silt loam	CL	A-6, A-7-6	0	100	100	85-100	60-95	26-44	8-22
	55-72	Loam, silty clay loam	CL, CL-ML, ML	A-4, A-6	0	100	100	85-100	60-95	18-39	2-18
22:											
Riverwash-----	0-6	Sand	SW-SM	A-1, A-2-4	0-5	78-100	69-100	35-70	3-15	7-12	NP-1
	6-80	Stratified sand to sandy loam	SM, SW-SM	A-1, A-2-4, A-4	0-5	78-100	69-100	35-70	3-40	7-16	NP-3
23A, 23B:											
Stuttgart-----	0-9	Silt loam	CL	A-6	0	100	100	90-100	70-90	24-41	7-21
	9-15	Silt loam	CL	A-6	0	100	100	90-100	70-90	24-41	7-21
	15-21	Silty clay loam, silty clay	CH	A-7-6	0	100	100	95-100	85-95	51-71	29-45
	21-27	Silty clay loam, silty clay	CH	A-7-6	0	100	100	95-100	85-95	51-71	29-45
	27-80	Silt loam, silty clay loam	CH, CL	A-6, A-7-6	0	100	100	90-100	70-95	31-56	13-33
24A, 25A:											
Tichnor-------	0-7	Silt loam	CL, CL-ML, ML	A-4, A-6	0	100	100	90-100	70-90	17-36	1-16
	7-31	Silt loam	CL, CL-ML, ML	A-4, A-6	0	100	100	90-100	70-90	17-36	1-16
	31-65	Silt loam, silty clay loam	CL	A-6, A-7-6	0	100	100	90-100	70-95	26-48	8-25
	65-80	Silt loam, silty clay loam	CL	A-6, A-7-6	0	100	100	90-100	70-95	26-48	8-25

Table 15.--Engineering Idex Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification Unified	Classification AASHTO	Fragments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
26C:											
Udipsamments--	0-5	Loamy fine sand	SM, SC-SM	A-2-4, A-4	0	100	100	70-85	28-45	7-21	NP-6
	5-80	Stratified sand to fine sand to loamy fine sand	SM, SC-SM, SW-SM	A-2-4, A-4	0	100	100	50-85	5-45	7-21	NP-6
27.											
Water											
28B:											
Yancopin------	0-3	Silty clay loam	CL	A-6, A-7-6	0	100	100	95-100	85-95	36-44	16-22
	3-36	Silt loam, silty clay loam	CL	A-6, A-7-6	0	100	100	90-100	70-95	30-44	11-22
	36-55	Silt loam, silty clay loam	CL	A-6, A-7-6	0	100	100	90-100	70-95	26-44	8-22
	55-72	Silty clay loam, silt loam, loam, sandy loam, fine sandy loam	CL, CL-ML, SC-SM, SC	A-6, A-2-4	0	100	100	60-100	30-95	21-39	4-18
29A:											
Yorktown------	0-7	Silty clay	CH	A-7-6	0	100	100	95-100	90-95	56-76	33-49
	7-60	Clay	CH	A-7	0	100	100	90-100	75-95	76-101	49-69
	60-72	Clay	CH	A-7	0	100	100	90-100	75-95	76-101	49-69
DAM.											
Dam											
LVS.											
Levee											

Table 16.--Physical and Chemical 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	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbonate	Sodium adsorption ratio	Linear extensibility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodibility group	Wind erodibility index
	In	Pct	g/cc	um/sec	In/in	meq/100 g	meq/100 g	pH	Pct		Pct	Pct					
1C:																	
Crevasse-------	0-4	5-12	1.45-1.55	42.00-141.00	0.06-0.10	4-10	---	5.6-7.3	0	0	0.0-2.9	0.5-1.0	.10	.10	5	2	134
	4-72	2-8	1.40-1.50	42.00-141.00	0.02-0.06	1-8	---	5.6-7.3	0	0	0.0-2.9	0.1-1.0	.15	.15			
2B:																	
Desha----------	0-9	40-60	1.20-1.40	0.42-1.40	0.15-0.20	15-25	---	6.1-7.8	0	0	6.0-8.9	1.0-3.0	.37	.37	5	4	86
	9-54	60-80	1.20-1.40	0.01-0.42	0.14-0.20	15-30	---	6.6-8.4	0	0	6.0-8.9	0.5-1.0	.28	.28			
	54-80	40-75	1.20-1.55	1.40-4.00	0.14-0.22	10-30	---	6.6-8.4	0	0	6.0-8.9	0.5-1.0	.32	.32			
3A:																	
Dewitt---------	0-7	10-27	1.35-1.50	4.00-14.00	0.16-0.20	10-25	---	4.5-6.0	0	0	0.0-2.9	0.5-3.0	.43	.43	5	5	56
	7-22	8-22	1.35-1.50	4.00-14.00	0.16-0.20	10-25	---	4.5-6.0	0	0	0.0-2.9	0.5-1.0	.43	.43			
	22-80	27-50	1.25-1.40	0.42-1.40	0.16-0.20	25-45	---	4.5-6.5	0	0-10	6.0-8.9	0.5-1.0	.32	.32			
4B:																	
Dubbs----------	0-5	5-18	1.40-1.50	4.00-14.00	0.20-0.22	1-5	---	4.5-6.0	0	0	0.0-2.9	0.5-2.0	.37	.37	5	5	56
	5-44	27-35	1.45-1.55	4.00-14.00	0.18-0.22	15-20	---	4.5-6.0	0	0	3.0-5.9	0.1-1.0	.37	.37			
	44-58	10-25	1.40-1.50	14.00-42.00	0.20-0.22	3-10	---	4.5-6.0	0	0	0.0-2.9	0.1-0.5	.37	.37			
	58-80	5-20	1.30-1.40	14.00-42.00	0.20-0.22	1-8	---	4.5-6.0	0	0	0.0-2.9	0.1-0.5	.37	.37			
5B:																	
Dundee---------	0-4	10-27	1.30-1.70	4.00-14.00	0.15-0.20	5-15	---	5.1-6.0	0	0	0.0-2.9	0.5-2.0	.43	.43	5	5	56
	4-10	18-34	1.30-1.70	1.40-4.00	0.15-0.20	---	5-12	4.5-6.0	0	0	3.0-5.9	0.5-1.0	.32	.32			
	10-30	18-34	1.30-1.70	1.40-4.00	0.15-0.20	---	5-12	4.5-6.0	0	0	3.0-5.9	0.5-1.0	.32	.32			
	30-40	18-34	1.30-1.70	1.40-4.00	0.15-0.20	---	5-12	4.5-6.0	0	0	3.0-5.9	0.5-1.0	.32	.32			
	40-60	18-25	1.30-1.70	1.40-4.00	0.15-0.20	---	5-8	4.5-6.0	0	0	3.0-5.9	0.5-1.0	.32	.32			
	60-72	10-25	1.30-1.70	4.00-14.00	0.15-0.20	5-15	---	4.5-7.3	0	0	0.0-2.9	0.1-0.5	.32	.32			
6A:																	
Ethel----------	0-5	14-27	1.35-1.55	4.00-14.00	0.16-0.20	6.0-15	---	5.1-6.0	0	0	0.0-2.9	0.5-2.0	.43	.43	5	5	56
	5-24	8-16	1.35-1.55	4.00-14.00	0.16-0.20	5.0-10	---	5.1-6.0	0	0	0.0-2.9	0.5-1.0	.43	.43			
	24-52	15-35	1.35-1.55	1.40-4.00	0.16-0.20	15-25	---	4.5-6.0	0	0	3.0-5.9	0.0-0.5	.43	.43			
	52-80	20-35	1.30-1.55	0.42-1.40	0.16-0.20	15-25	---	4.5-6.0	0	1-5	3.0-5.9	0.0-0.5	.43	.43			
7A:																	
Forestdale-----	0-5	27-38	1.50-1.55	1.40-4.00	0.20-0.22	15-35	---	5.1-6.0	0	0	3.0-5.9	0.5-3.0	.37	.37	5	7	38
	5-39	40-60	1.50-1.60	0.01-0.42	0.14-0.18	---	20-40	4.5-6.0	0	0	6.0-8.9	0.5-1.0	.28	.28			
	39-80	10-35	1.45-1.55	1.40-4.00	0.17-0.22	---	5-25	4.5-6.0	0	0	3.0-5.9	0.1-0.5	.37	.37			

Table 16.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon- ate	Sodium adsorp- tion ratio	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	um/sec	In/in	meq/100 g	meq/100 g	pH	Pct		Pct	Pct					
8A:																	
Hebert	0-4	10-27	1.30-1.65	4.00-14.00	0.15-0.20	4.0-15	---	5.1-6.5	0	0	0.0-2.9	0.5-3.0	.43	.43	5	5	56
	4-20	14-35	1.30-1.70	1.40-4.00	0.15-0.20	4.0-25	---	4.5-6.5	0	0	3.0-5.9	0.5-1.0	.32	.32			
	20-50	14-35	1.30-1.70	1.40-4.00	0.15-0.20	4.0-25	---	4.5-6.5	0	0	3.0-5.9	0.5-1.0	.32	.32			
	50-72	10-35	1.30-1.70	4.00-14.00	0.15-0.20	4.0-25	---	5.1-6.5	0	0	0.0-2.9	0.0-0.5	.37	.37			
9A, 9B, 9C, 9D, 9E:																	
Immanuel	0-7	12-16	1.40-1.50	4.00-14.00	0.16-0.20	10-15	---	5.1-6.0	0	0	0.0-2.9	0.5-2.0	.43	.43	5	5	56
	7-28	18-30	1.40-1.50	1.40-4.00	0.16-0.20	15-25	15-25	4.5-5.5	0	0	0.0-2.9	0.5-1.0	.43	.43			
	28-33	8-16	1.35-1.50	14.00-42.00	0.18-0.20	10-15	10-15	4.5-5.5	0	0	0.0-2.9	0.0-0.5	.49	.49			
	33-53	15-32	1.35-1.55	4.00-14.00	0.16-0.20	15-25	15-25	4.5-6.5	0	0	0.0-2.9	0.0-0.5	.37	.37			
	53-80	15-32	1.40-1.50	1.40-4.00	0.16-0.20	15-25	15-25	4.5-6.5	0	0	0.0-2.9	0.0-0.5	.37	.37			
10A, 10C:																	
Keo	0-5	7-20	1.35-1.60	4.00-14.00	0.15-0.20	5.0-15	---	6.1-7.8	0	0	0.0-2.9	1.0-3.0	.37	.37	5	5	56
	5-19	10-25	1.35-1.60	4.00-14.00	0.16-0.20	5.0-15	---	6.6-8.4	0	0	0.0-2.9	0.1-0.5	.37	.37			
	19-39	10-25	1.35-1.60	4.00-14.00	0.16-0.20	5.0-15	---	6.6-8.4	0	0	0.0-2.9	0.1-0.5	.37	.37			
	39-47	8-30	1.35-1.60	4.00-42.00	0.10-0.20	5.0-20	---	6.6-8.4	0	0	0.0-2.9	0.0-0.5	.37	.37			
	47-60	8-30	1.35-1.60	4.00-42.00	0.10-0.20	5.0-20	---	6.6-8.4	0	0	0.0-2.9	0.0-0.5	.37	.37			
	60-80	8-30	1.35-1.60	4.00-42.00	0.10-0.20	5.0-20	---	6.6-8.4	0	0	0.0-2.9	0.0-0.5	.37	.37			
11A:																	
Kobel	0-5	40-50	1.20-1.50	0.01-0.42	0.14-0.20	20-45	---	5.6-7.3	0	0	9.0-25.0	1.0-3.0	.37	.37	5	7	38
	5-40	40-55	1.20-1.50	0.01-0.42	0.14-0.20	35-50	---	6.1-7.8	0	0	9.0-25.0	0.5-1.0	.37	.37			
	40-54	30-50	1.20-1.50	0.01-0.42	0.14-0.20	35-50	---	6.1-7.8	0	0	9.0-25.0	0.5-1.0	.37	.37			
	54-72	30-50	1.20-1.50	0.42-1.40	0.14-0.20	35-50	---	6.1-8.4	0	0	6.0-8.9	0.0-0.5	.37	.37			
12A:																	
Kobel	0-5	40-50	1.20-1.50	0.01-0.42	0.14-0.20	20-45	---	5.6-7.3	0	0	9.0-25.0	1.0-3.0	.37	.37	5	8	0
	5-40	40-55	1.20-1.50	0.01-0.42	0.14-0.20	35-50	---	6.1-7.8	0	0	9.0-25.0	0.5-1.0	.37	.37			
	40-54	30-50	1.20-1.50	0.01-0.42	0.14-0.20	35-50	---	6.1-7.8	0	0	9.0-25.0	0.5-1.0	.37	.37			
	54-72	30-50	1.20-1.50	0.42-1.40	0.14-0.20	35-50	---	6.1-8.4	0	0	6.0-8.9	0.0-0.5	.37	.37			
13A:																	
Lagrue	0-4	27-40	1.30-1.65	0.42-1.40	0.16-0.22	5.0-20	---	5.1-7.3	0	0	3.0-5.9	0.5-4.0	.43	.43	5	7	38
	4-11	35-55	1.20-1.60	0.01-0.42	0.16-0.22	15-50	---	3.5-6.0	0	0-5	6.0-8.9	0.0-0.5	.32	.32			
	11-80	35-55	1.20-1.60	0.01-0.42	0.16-0.22	15-50	---	3.5-6.0	0	0-5	6.0-8.9	0.0-0.5	.32	.32			
14B, 14C, 14D:																	
Muskogee	0-5	10-27	1.25-1.50	4.00-14.00	0.16-0.20	10-20	10-20	5.1-6.5	0	0	0.0-2.9	0.5-2.0	.43	.43	5	5	56
	5-10	27-40	1.25-1.45	1.40-4.00	0.16-0.22	15-30	15-30	5.1-6.5	0	0	3.0-5.9	0.1-0.5	.37	.37			
	10-60	40-55	1.20-1.45	0.42-1.40	0.14-0.18	30-55	---	5.6-8.4	0	0	6.0-8.9	0.0-0.5	.32	.32			
	60-90	40-55	1.20-1.45	0.42-1.40	0.14-0.18	30-55	---	5.6-8.4	0	0	6.0-8.9	0.0-0.5	.32	.32			

Table 16.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon-ate	Sodium adsorp-tion ratio	Linear extensi-bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	g/cc	um/sec	In/in	meq/100 g	meq/100 g	pH	Pct		Pct	Pct					
15A:																	
Oaklimeter-----	0-8	10-16	1.40-1.50	4.00-14.00	0.20-0.22	---	2-5	4.5-6.0	0	0	0.0-2.9	0.5-2.0	.43	.43	5	5	56
	8-40	7-18	1.40-1.50	4.00-14.00	0.15-0.20	---	2-5	4.5-5.5	0	0	0.0-2.9	0.5-1.0	.43	.43			
	40-55	7-27	1.40-1.50	4.00-14.00	0.20-0.22	---	2-12	4.5-5.5	0	0	0.0-2.9	0.1-0.5	.43	.43			
	55-72	7-30	1.40-1.50	4.00-14.00	0.20-0.22	---	2-12	4.5-5.5	0	0	0.0-2.9	0.1-0.5	.43	.43			
16A:																	
Overcup--------	0-8	12-27	1.30-1.45	4.00-14.00	0.14-0.20	11-20	---	5.1-6.0	0	0	0.0-2.9	0.5-2.0	.43	.43	5	6	48
	8-14	8-27	1.30-1.45	4.00-14.00	0.14-0.20	11-20	---	4.5-6.0	0	0	0.0-2.9	0.5-1.0	.43	.43			
	14-40	40-55	1.20-1.35	0.01-0.42	0.14-0.20	25-50	25-50	4.5-6.5	0	0	6.0-8.9	0.5-1.0	.37	.37			
	40-60	40-55	1.20-1.35	0.01-0.42	0.14-0.20	25-50	25-50	4.5-6.5	0	0	6.0-8.9	0.5-1.0	.37	.37			
	60-72	27-50	1.25-1.40	1.40-4.00	0.14-0.20	20-40	---	5.6-8.4	0	0	6.0-8.9	0.1-1.0	.37	.37			
17A, 18A:																	
Perry----------	0-4	40-80	1.20-1.55	0.01-0.42	0.12-0.18	20-50	20-50	5.1-6.5	0	0	6.0-8.9	0.5-3.0	.32	.32	5	4	86
	4-36	55-85	1.15-1.40	0.01-0.42	0.12-0.18	20-50	---	4.5-6.5	0	0	9.0-25.0	0.5-1.0	.28	.28			
	36-80	55-85	1.15-1.35	0.01-0.42	0.12-0.18	20-50	---	6.6-8.4	0	0	9.0-25.0	0.0-0.5	.28	.28			
19A, 20A:																	
Portland-------	0-4	40-60	1.15-1.50	0.01-0.42	0.12-0.18	35-60	35-60	4.5-6.5	0	0	6.0-8.9	1.0-3.0	.32	.32	5	4	86
	4-30	60-85	1.15-1.45	0.01-0.42	0.12-0.18	35-60	35-60	4.5-6.5	0	0	6.0-8.9	0.5-1.0	.32	.32			
	30-50	55-85	1.15-1.45	0.01-0.42	0.12-0.18	30-50	---	6.1-8.4	0	0	6.0-8.9	0.5-1.0	.32	.32			
	50-80	15-60	1.15-1.55	0.42-14.00	0.12-0.22	10-40	---	6.1-8.4	0	0	6.0-8.9	0.1-0.5	.32	.32			
21A, 21B:																	
Rilla----------	0-5	8-27	1.30-1.70	4.00-14.00	0.21-0.23	4.0-15	---	5.1-6.5	0	0	0.0-2.9	0.5-2.0	.43	.43	5	5	56
	5-35	18-35	1.30-1.70	4.00-14.00	0.20-0.22	5.0-25	5.0-25	4.5-5.5	0	0	3.0-5.9	0.5-1.0	.32	.32			
	35-55	15-35	1.30-1.70	4.00-14.00	0.18-0.22	5.0-25	---	5.1-6.0	0-5	0	0.0-2.9	0.0-0.5	.32	.32			
	55-72	7-30	1.30-1.70	4.00-14.00	0.18-0.22	5.0-25	---	4.5-7.3	0-5	0	0.0-2.9	0.0-0.5	.32	.32			
22:																	
Riverwash------	0-6	0-5	1.50-1.80	42.00-141.00	0.03-0.04	1-5	---	5.6-7.3	0	0	0.0-2.9	0.0-0.5	.10	---	5	1	180
	6-80	0-10	1.50-1.80	42.00-141.00	0.04-0.06	1-5	---	5.6-7.3	0	0	0.0-2.9	0.0-0.0	.10	---			
23A, 23B:																	
Stuttgart------	0-9	8-25	1.25-1.60	1.40-4.00	0.18-0.22	10-25	---	5.1-6.0	0	0	0.0-2.9	0.5-3.0	.49	.49	4	5	56
	9-15	8-25	1.25-1.60	1.40-4.00	0.18-0.22	10-25	---	5.1-6.0	0	0	0.0-2.9	0.5-1.0	.49	.49			
	15-21	35-55	1.35-1.60	0.01-0.42	0.14-0.22	25-45	---	4.5-6.0	0	1-5	6.0-8.9	0.1-1.0	.32	.32			
	21-27	35-55	1.35-1.60	0.01-0.42	0.14-0.22	25-45	---	4.5-6.0	0	1-5	6.0-8.9	0.1-1.0	.32	.32			
	27-80	15-40	1.30-1.60	0.42-1.40	0.18-0.22	15-35	---	5.6-7.8	0	1-5	3.0-5.9	0.0-0.5	.43	.43			
24A:																	
Tichnor--------	0-7	5-27	1.35-1.50	4.00-14.00	0.14-0.20	10-20	10-20	3.5-6.0	0	0	0.0-2.9	1.0-3.0	.43	.43	5	5	56
	7-31	5-27	1.35-1.55	4.00-14.00	0.14-0.20	10-20	10-20	3.5-6.0	0	0	0.0-2.9	0.5-1.0	.43	.43			
	31-65	15-40	1.40-1.55	1.40-4.00	0.14-0.20	15-30	15-30	3.5-6.0	0	0	0.0-2.9	0.0-0.5	.37	.37			
	65-80	15-40	1.40-1.55	1.40-4.00	0.14-0.20	15-30	15-30	3.5-6.0	0	0	0.0-2.9	0.0-0.5	.37	.37			

Table 16.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon-ate	Sodium adsorp-tion ratio	Linear extensi-bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	g/cc	um/sec	In/in	meq/100 g	meq/100 g	pH	Pct		Pct	Pct					
25A:																	
Tichnor--------	0-7	5-27	1.35-1.50	4.00-14.00	0.14-0.20	10-20	10-20	3.5-6.0	0	0	0.0-2.9	1.0-3.0	.43	.43	5	8	0
	7-31	5-27	1.35-1.55	4.00-14.00	0.14-0.20	10-20	10-20	3.5-6.0	0	0	0.0-2.9	0.5-1.0	.43	.43			
	31-65	15-40	1.40-1.55	1.40-4.00	0.14-0.20	15-30	15-30	3.5-6.0	0	0	0.0-2.9	0.0-0.5	.37	.37			
	65-80	15-40	1.40-1.55	1.40-4.00	0.14-0.20	15-30	15-30	3.5-6.0	0	0	0.0-2.9	0.0-0.5	.37	.37			
26C:																	
Udipsamments---	0-5	0-15	1.55-1.80	42.00-141.00	0.02-0.06	2-10	---	5.6-7.3	0	0	0.0-2.9	0.5-2.0	.10	.10	5	1	180
	5-80	0-15	1.55-1.80	42.00-141.00	0.02-0.06	2-10	---	5.6-7.3	0	0	0.0-2.9	0.0-0.5	.15	.15			
27.																	
Water																	
28B:																	
Yancopin-------	0-3	27-35	1.25-1.45	1.40-4.00	0.14-0.20	10-25	---	5.6-7.3	0	0	3.0-5.9	1.0-4.0	.37	.37	5	7	38
	3-36	20-35	1.35-1.50	1.40-14.00	0.14-0.20	10-25	---	6.1-7.3	0	0	3.0-5.9	0.5-2.0	.37	.37			
	36-55	15-35	1.35-1.50	1.40-14.00	0.14-0.20	10-25	---	6.1-7.3	0	0	3.0-5.9	0.5-2.0	.37	.37			
	55-72	10-30	1.35-1.50	1.40-14.00	0.14-0.20	10-25	---	6.1-7.8	0	0	3.0-5.9	0.0-1.0	.32	.32			
29A:																	
Yorktown-------	0-7	40-60	1.25-1.45	0.01-0.42	0.16-0.22	25-60	---	5.6-7.3	0	0	6.0-8.9	1.0-8.0	.32	.32	5	8	0
	7-60	60-85	1.25-1.45	0.01-0.42	0.09-0.14	30-60	---	5.6-7.3	0	0	9.0-25.0	1.0-3.0	.32	.32			
	60-72	60-85	1.30-1.50	0.01-0.42	0.08-0.14	30-60	---	7.4-8.4	0	0	9.0-25.0	0.5-2.0	.32	.32			
DAM.																	
Dam																	
LVS.																	
Levee																	

Table 17.--Soil and Water Features

(Depths of layers are in feet. 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	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
			Ft	Ft	Ft						
1C:											
Crevasse-------	A									Low	Moderate
		Jan-Apr	---	---	---	---	None	Very brief	Occasional		
		May-Nov	---	---	---	---	None	---	None		
		Dec	---	---	---	---	None	Very brief	Occasional		
2B:											
Desha----------	D									High	Low
		Jan-Apr	0.0-1.5	0.5-2.0	---	---	None	Brief	Occasional		
		May-Nov	---	---	---	---	None	---	None		
		Dec	0.0-1.5	0.5-2.0	---	---	None	Brief	Occasional		
3A:											
Dewitt---------	C									High	Moderate
		Jan-Apr	0.5-1.5	1.0-2.0	---	---	None	---	None		
		May-Nov	---	---	---	---	None	---	None		
		Dec	0.5-1.5	1.0-2.0	---	---	None	---	None		
4B:											
Dubbs----------	B										
		Jan-Dec	---	---	---	---	None	---	None	Moderate	Moderate
5B:											
Dundee---------	C									High	Moderate
		Jan-Apr	1.5-3.5	>6.0	---	---	None	Brief	Occasional		
		May-Nov	---	---	---	---	None	---	None		
		Dec	1.5-3.5	>6.0	---	---	None	Brief	Occasional		
6A:											
Ethel----------	C									Moderate	Moderate
		Jan-Apr	0.0-2.0	0.5-2.5	---	---	None	---	None		
		May-Nov	---	---	---	---	None	---	None		
		Dec	0.0-2.0	0.5-2.5	---	---	None	---	None		
7A:											
Forestdale-----	D									High	Moderate
		Jan-Apr	0.5-2.0	>6.0	---	---	None	Long	Frequent		
		May-Nov	---	---	---	---	None	---	None		
		Dec	0.5-2.0	>6.0	---	---	None	Long	Frequent		
8A:											
Hebert---------	C									High	Moderate
		Jan-Apr	1.5-3.0	>6.0	---	---	None	---	None		
		May-Nov	---	---	---	---	None	---	None		
		Dec	1.5-3.0	>6.0	---	---	None	---	None		
9A, 9B, 9C, 9D, 9E:											
Immanuel------	C									Moderate	Moderate
		Jan-Apr	1.5-2.5	2.0-3.0	---	---	None	---	None		
		May-Nov	---	---	---	---	None	---	None		
		Dec	1.5-2.5	2.0-3.0	---	---	None	---	None		
10A, 10C:											
Keo------------	B									Low	Low
		Jan-Apr	---	---	---	---	None	Brief	Occasional		
		May-Nov	---	---	---	---	None	---	None		
		Dec	---	---	---	---	None	Brief	Occasional		

Table 17.—Soil and 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	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
			Ft	Ft	Ft						
11A:											
Kobel----------	D									High	Moderate
		Jan-Apr	0.0-1.0	>6.0	---	---	None	Long	Frequent		
		May-Nov	---	---	---	---	None	---	None		
		Dec	0.0-1.0	>6.0	---	---	None	Long	Frequent		
12A:											
Kobel----------	D									High	Moderate
		Jan-Apr	0.0-1.0	>6.0	0.5-5.0	Very long	Frequent	Long	Frequent		
		May-Jun	0.0-1.0	>6.0	0.5-5.0	Very long	Frequent	---	None		
		Jul-Aug	---	---	---	---	None	---	None		
		Sep-Nov	0.0-1.0	>6.0	---	---	None	---	None		
		Dec	0.0-1.0	>6.0	0.5-5.0	Very long	Frequent	Long	Frequent		
13A:											
Lagrue---------	D									---	---
		Jan-Apr	0.0-1.0	0.5-1.5	---	---	None	---	None		
		May-Nov	---	---	---	---	None	---	None		
		Dec	0.0-1.0	0.5-1.5	---	---	None	---	None		
14B, 14C, 14D:											
Muskogee-------	C									High	Moderate
		Jan-Apr	1.0-2.0	>6.0	---	---	None	---	None		
		May-Nov	---	---	---	---	None	---	None		
		Dec	1.0-2.0	>6.0	---	---	None	---	None		
15A:											
Oaklimeter-----	C									Moderate	High
		Jan-Apr	1.5-2.5	>6.0	---	---	None	Very brief	Occasional		
		May-Nov	---	---	---	---	None	---	None		
		Dec	1.5-2.5	>6.0	---	---	None	Very brief	Occasional		
16A:											
Overcup--------	D									High	Moderate
		Jan-Apr	0.0-1.0	>6.0	---	---	None	---	None		
		May-Nov	---	---	---	---	None	---	None		
		Dec	0.0-1.0	>6.0	---	---	None	---	None		
17A:											
Perry----------	D									High	Moderate
		Jan-Apr	0.0-2.0	0.5-2.5	---	---	None	---	None		
		May-Nov	---	---	---	---	None	---	None		
		Dec	0.0-2.0	0.5-2.5	---	---	None	---	None		
18A:											
Perry----------	D									High	Moderate
		Jan-Apr	0.0-2.0	0.5-2.5	---	---	None	Long	Frequent		
		May-Nov	---	---	---	---	None	---	None		
		Dec	0.0-2.0	0.5-2.5	---	---	None	Long	Frequent		
19A:											
Portland-------	D									High	Moderate
		Jan-Apr	1.0-2.0	1.5-2.5	---	---	None	---	None		
		May-Nov	---	---	---	---	None	---	None		
		Dec	1.0-2.0	1.5-2.5	---	---	None	---	None		
20A:											
Portland-------	D									High	Moderate
		Jan-Apr	1.0-2.0	1.5-2.5	---	---	None	Brief	Frequent		
		May-Nov	---	---	---	---	None	---	None		
		Dec	1.0-2.0	1.5-2.5	---	---	None	Brief	Frequent		

Table 17.—Soil and 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	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
			Ft	Ft	Ft						
21A, 21B:											
Rilla----------	B									Moderate	High
		Jan-Dec	---	---	---	---	None	---	None		
22:											
Riverwash------	D									---	---
		Jan-Jun	0.0-2.0	>6.0	---	---	None	Very long	Frequent		
		Jul-Aug	---	---	---	---	None	---	None		
		Sep-Dec	0.0-2.0	>6.0	---	---	None	Very long	Frequent		
23A, 23B:											
Stuttgart------	D									High	Low
		Jan-Apr	1.0-2.0	>6.0	---	---	None	---	None		
		May-Nov	---	---	---	---	None	---	None		
		Dec	1.0-2.0	>6.0	---	---	None	---	None		
24A:											
Tichnor--------	C									High	Moderate
		Jan-Apr	0.0-1.0	>6.0	---	---	None	Long	Frequent		
		May-Nov	---	---	---	---	None	---	None		
		Dec	0.0-1.0	>6.0	---	---	None	Long	Frequent		
25A:											
Tichnor--------	C									High	Moderate
		Jan-Apr	0.0-1.0	>6.0	0.5-5.0	Very long	Frequent	Very long	Frequent		
		May-Jun	0.0-1.0	>6.0	0.5-5.0	Very long	Frequent	---	None		
		Jul-Aug	---	---	---	---	None	---	None		
		Sep-Nov	0.0-1.0	>6.0	---	---	None	---	None		
		Dec	0.0-1.0	>6.0	0.5-5.0	Very long	Frequent	Very long	Frequent		
26C:											
Udipsamments---	A									Low	Moderate
		Jan-Apr	3.5-6.0	>6.0	---	---	None	---	None		
		May-Nov	---	---	---	---	None	---	None		
		Dec	3.5-6.0	>6.0	---	---	None	---	None		
27.											
Water											
28B:											
Yancopin-------	C									High	Moderate
		Jan-Apr	1.5-4.0	2.0-4.5	---	---	None	Brief	Frequent		
		May-Nov	---	---	---	---	None	---	None		
		Dec	1.5-4.0	2.0-4.5	---	---	None	Brief	Frequent		
29A:											
Yorktown-------	D									High	Moderate
		Jan-Apr	0.0-1.0	0.5-1.5	0.5-5.0	Very long	Frequent	Very long	Frequent		
		May-Jun	---	---	0.5-5.0	Very long	Frequent	---	None		
		Jul-Nov	---	---	---	---	None	---	None		
		Dec	0.0-1.0	0.5-1.5	0.5-5.0	Very long	Frequent	Very long	Frequent		
DAM.											
Dam											
LVS.											
Levee											

Table 18.--Physical Test Data for Selected Soils

(All analysis run in duplicate. All data reported on oven dry basis. Dashes indicate that analyses were not made. Sands by seiving; remainder by hydrometer method of Day et al. SSSAP 20: 167-169 (1956). The pedons are typical of the soil series in the survey area. For the location of the pedons, see the section "Soil Series and their Morphology".)

Soil name and pedon number	Horizon	Depth	Fine earth particle-size distribution (percent)											Textural class
			Sand (mm)						Silt (um)				Clay (um)	
		(in)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	Total (2-0.05)	Coarse (50-20)	Medium (20-5)	Fine (5-2)	Total (50-2)	Total (<2)	
Dewitt														
(94AR02)	Ap	0-7	0.1	0.1	0.1	0.4	1.7	2.4	32.5	43.9	9.9	86.3	11.3	Silt loam, silt
	Eg1	7-15	0.5	0.8	0.5	0.6	1.5	3.9	26.3	38.4	10.8	75.5	20.6	Silt loam
	Eg2	15-22	0.6	0.9	0.5	0.7	1.6	4.3	26.5	41.9	11.4	79.8	15.9	Silt loam
	Btg1	22-33	0.4	0.9	0.6	0.5	1.0	3.4	19.8	29.6	8.7	58.1	38.5	Silty clay loam
	Btg2	33-43	0.2	0.4	0.4	0.6	1.0	2.6	19.6	33.3	9.4	62.3	35.1	Silty clay loam
	Btg3	43-53	0.2	0.4	0.5	0.7	1.4	3.2	21.8	35.8	9.1	66.7	30.1	Silty clay loam
	Btg4(1)	53-62	0.3	0.5	0.5	0.6	1.5	3.4	20.2	34.6	10.4	65.2	31.4	Silty clay loam
	Btg4(2)	62-71	0.2	0.4	0.6	0.9	1.7	3.8	22.2	32.8	10.0	65.0	31.2	Silty clay loam
	Btg4(3)	71-80	0.2	0.4	0.5	0.9	1.6	3.6	21.7	33.1	10.3	65.1	31.3	Silty clay loam
Ethel														
(94AR04)	Ap	0-5	0.1	0.2	0.2	0.1	0.4	1.0	33.5	44.3	7.8	85.6	13.4	Silt loam
	Eg1	5-13	0.5	0.8	0.5	0.4	0.6	2.8	29.6	42.4	7.7	79.7	17.5	Silt loam
	Eg2	13-24	0.7	1.1	0.6	0.4	0.5	3.3	31.3	41.2	9.5	82.0	14.7	Silt loam
	Btg1/Eg	24-38	1.3	2.3	1.4	1.1	0.7	6.8	22.2	32.6	7.1	61.9	31.3	Silty clay loam
	Btg2/Eg	38-52	0.3	0.7	0.7	0.6	0.6	2.9	23.6	36.3	6.6	66.5	30.6	Silty clay loam
	Btg1	52-64	0.2	0.6	0.6	0.8	0.7	2.9	24.2	37.0	7.7	68.9	28.2	Silty clay loam
	Btg2	64-80	0.2	0.3	0.3	0.4	0.8	2.0	21.9	34.7	7.9	64.5	33.5	Silty clay loam
Immanuel														
(94AR05)	Ap	0-7	0.1	0.4	0.4	0.7	1.8	3.4	37.8	41.6	4.9	84.3	12.3	Silt loam, silt
	Bt1	7-18	0.1	0.2	0.2	0.3	0.6	1.4	19.7	38.2	7.4	65.3	33.3	Silty clay loam
	Bt2	18-28	0.1	0.4	0.5	0.6	0.6	2.2	22.7	37.7	9.0	69.4	28.4	Silty clay loam
	Eg	28-33	0.1	0.5	0.6	0.6	0.8	2.6	28.0	44.0	7.0	79.0	18.4	Silt loam
	B´tx/Eg(1)	33-43	0.1	0.2	0.3	0.4	0.8	1.8	27.0	40.8	4.9	72.7	25.5	Silt loam
	B´tx/Eg(2)	43-53	0.1	0.1	0.2	0.4	1.6	2.4	28.5	40.7	5.1	74.3	23.3	Silt loam
	B´t(1)	53-67	0.3	0.5	0.5	0.8	4.0	6.1	27.0	41.0	4.8	72.8	21.1	Silt loam
	B´t(2)	67-80	0.5	0.6	0.4	1.2	8.8	11.5	29.7	34.0	4.1	67.8	20.7	Silt loam

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (Soil Survey Staff, 1998 and 1999). 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 19 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 *Typic* identifies the subgroup that typifies the great group. An example is Typic 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, mineral content, soil temperature regime, soil depth, and reaction. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-silty, mixed, active, thermic Typic 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” (Soil Survey Division Staff, 1993). Many of the technical terms used in the descriptions are defined in “Soil Taxonomy” (Soil Survey Staff, 1999) and in “Keys to Soil Taxonomy” (Soil Survey Staff, 1998). Unless otherwise indicated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section “Detailed Soil Map Units.”

Crevasse Series

Depth class: Very deep
Drainage class: Excessively drained
Permeability: Rapid
Landscape: Arkansas River valley
Landform: Natural levee

Parent material: Sandy alluvium
Commonly associated soils: Keo and Riverwash miscellaneous areas
Slope range: 0 to 5 percent
Taxonomic class: Mixed, thermic Typic Udipsamments

Typical Pedon

Crevasse loamy fine sand, 0 to 5 percent slopes, occasionally flooded, in a sparsely wooded area in the SW1/4NE1/4SW1/4 sec. 36, T. 8 N., R. 2 W.

A—0 to 4 inches; dark brown (10YR 4/3) loamy fine sand; single grain; loose; few fine roots; slightly acid; abrupt smooth boundary.
C1—4 to 16 inches; yellowish brown (10YR 5/4) sand; single grain; loose; few fine roots; neutral; abrupt smooth boundary.
C2—16 to 35 inches; pale brown (10YR 6/3) sand; single grain; loose; neutral; abrupt smooth boundary.
C3—35 to 72 inches; grayish brown (10YR 5/2) sand; single grain; loose; neutral.

Range in Characteristics

Solum thickness: 4 to 10 inches

A horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 2 or 3
Texture—loamy fine sand
Redoximorphic concentrations and depletions—none
Reaction—moderately acid to neutral

C horizon:
Color—hue of 10YR, value of 5, and chroma of 2, 3, 4, or 6, or value of 6 and chroma of 3 or 4
Texture—sand, loamy sand, or loamy fine sand
Redoximorphic concentrations and depletions—none
Reaction—moderately acid to neutral

Desha Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Very slow
Landscape: Arkansas River valley
Landform: Flood plain
Parent material: Clayey alluvium
Commonly associated soils: Keo, Perry, and Portland
Slope range: 0 to 3 percent
Taxonomic class: Very-fine, smectitic, thermic Vertic Hapludolls

Typical Pedon

Desha silty clay, 0 to 3 percent slopes, occasionally flooded, in a wooded area in the SE1/4NE1/4SW1/4 sec. 18, T. 8 S., R. 1 W.

A—0 to 9 inches; dark reddish brown (5YR 3/2) silty clay; moderate fine subangular blocky structure; firm; common fine and medium roots; neutral; clear smooth boundary.
Bwss1—9 to 28 inches; dark reddish brown (5YR 3/2) clay; moderate medium subangular blocky structure; firm; few fine pores; few medium cemented calcium carbonate concretions; common slickensides that do not intersect; neutral; gradual wavy boundary.
Bwss2—28 to 37 inches; dark reddish brown (5YR 3/3) clay; moderate fine subangular blocky structure; firm; few fine pores; few distinct brown (10YR 5/3) iron depletions; few medium cemented calcium carbonate concretions; common slickensides that do not intersect; slightly alkaline; gradual wavy boundary.
Bwss3—37 to 54 inches; dark reddish brown (5YR 3/3) clay; moderate medium subangular blocky structure; very firm; few pores; common distinct brown (10YR 5/3) iron depletions; few medium cemented calcium carbonate concretions; few slickensides that do not intersect; slightly alkaline; clear wavy boundary.
BCk—54 to 80 inches; reddish brown (5YR 4/4) clay; weak medium subangular blocky structure; firm; few fine pores; common medium faint reddish brown (5YR 5/3) iron depletions; few black manganese concentrations on faces of peds; common medium cemented calcium carbonate concretions; calcareous; moderately alkaline.

Range in Characteristics

Solum thickness: More than 60 inches

A horizon:
Color—hue of 5YR, value of 3, and chroma of 2 or 3; or hue of 7.5YR, value of 3, and chroma of 2
Texture—silty clay
Redoximorphic concentrations and depletions—none
Reaction—slightly acid to slightly alkaline

Bwss horizon (upper part):
Color—hue of 5YR, value of 3, and chroma of 2 or 3
Texture—clay

Redoximorphic concentrations and depletions—shades of brown
Reaction—neutral to moderately alkaline

Bwss horizon (lower part):
Color—hue of 5YR, value of 3 or 4, and chroma of 3 or 4
Texture—clay
Redoximorphic concentrations and depletions—shades of brown
Reaction—neutral to moderately alkaline

BCk horizon and BC horizon (where present):
Color—hue of 2.5YR or 5YR, value of 3 or 4, and chroma of 3 or 4
Texture—silty clay or clay
Redoximorphic concentrations and depletions—shades of gray or brown
Reaction—neutral to moderately alkaline

Dewitt Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Slow
Landscape: Grand Prairie upland
Landform: Stream terrace
Parent material: Loamy alluvium
Commonly associated soils: Ethel, Lagrue, Muskogee, and Stuttgart
Slope range: 0 to 1 percent
Taxonomic class: Fine, smectitic, thermic Typic Albaqualfs

Typical Pedon

Dewitt silt loam, 0 to 1 percent slopes, in a cultivated field in the NW1/4NW1/4NE1/4 sec. 16, T. 2 S., R. 5 W.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam; moderate medium granular and weak medium and coarse subangular blocky structure; friable; bottom 2 to 3 inches of horizon is compacted and dense; common fine and medium pores; common fine roots; common medium distinct dark brown (7.5YR 3/2) iron concentrations; common very fine distinct brown to dark brown (7.5YR 4/4) oxidized rhizospheres around old root channels; common fine and medium iron-manganese concretions; slightly acid; clear smooth boundary.

Eg1—7 to 15 inches; grayish brown (10YR 5/2) silt loam; weak coarse subangular blocky structure; friable; many fine and medium pores; few fine roots; common medium distinct dark yellowish brown (10YR 4/4) and few medium distinct dark brown (10YR 3/3) iron concentrations; few fine dark brown (10YR 3/3) soft iron-manganese masses; common fine and medium iron-manganese concretions; neutral; gradual smooth boundary.

Eg2—15 to 22 inches; light brownish gray (10YR 6/2) silt loam; weak medium and coarse subangular blocky structure; friable; many fine and medium pores; few fine roots; common medium distinct dark yellowish brown (10YR 4/6) iron concentrations; common fine and medium distinct dark yellowish brown (10YR 3/4) soft iron masses; many fine, medium, and coarse rounded iron-manganese concretions; neutral; abrupt smooth boundary.

Btg1—22 to 33 inches; gray (10YR 5/1) silty clay loam; moderate fine and medium subangular blocky structure; firm; common fine pores; few fine roots; many distinct clay films on faces of peds and lining pores; common fine and medium prominent red (2.5YR 4/6) and few medium faint brown (10YR 5/3) iron concentrations; common fine and medium iron-manganese concretions; few fine and medium soft iron-manganese masses; strongly acid; gradual smooth boundary

Btg2—33 to 43 inches; grayish brown (10YR 5/2) silty clay loam; moderate medium and coarse subangular blocky structure; firm; few fine pores; few fine roots; many distinct clay films on faces of peds and lining pores; common medium and coarse faint brown (10YR 5/3) and few medium and coarse distinct yellowish brown (10YR 5/6) iron concentrations; common fine iron-manganese concretions; common fine and medium brown to black soft iron-manganese masses; few medium black manganese concentrations on faces of peds; strongly acid; gradual smooth boundary.

Btg3—43 to 53 inches; grayish brown (10YR 5/2) silty clay loam; moderate medium and coarse subangular blocky structure; firm; few fine pores; few fine roots; many distinct clay films on faces of peds and lining pores; common medium and coarse faint brown (10YR 5/3) and few medium and coarse distinct yellowish brown (10YR 5/6) iron concentrations; common fine iron-manganese concretions; common fine and medium brown to black soft iron-manganese masses; few medium black manganese concentrations on faces of some peds; strongly acid; gradual smooth boundary.

Btg4—53 to 80 inches; light brownish gray (10YR 6/2) silty clay loam; weak coarse and very coarse prismatic parting to moderate medium and coarse subangular blocky structure; firm; common fine pores, many of which are lined with manganese and some lined with brown (7.5YR 4/4) clay films; common distinct clay films on faces of peds and lining most pores; many medium and coarse distinct strong brown (7.5YR 5/6) and yellowish brown (10YR 5/6) iron accumulations; common fine and medium yellow to brown soft iron-manganese masses; many coarse black manganese accumulations on faces of peds; common medium and coarse black manganese concentrations on some very coarse prism faces; common fine iron-manganese concretions; strongly acid.

Range in Characteristics

Solum thickness: More than 80 inches

Ap horizon:
- Color—hue of 10YR, value of 4 or 5, and chroma of 1 or 2
- Texture—silt loam
- Redoximorphic concentrations and depletions—shades of gray or brown
- Reaction—very strongly acid to moderately acid, or ranging to neutral where limed or affected by irrigation water

Eg horizon:
- Color—hue of 10YR, value of 5 or 6, and chroma of 1 or 2
- Texture—silt or silt loam
- Redoximorphic concentrations and depletions—shades of gray or brown
- Reaction—very strongly acid to moderately acid, or ranging to neutral where limed or affected by irrigation water

Btg horizon:
- Color—hue of 10YR, value of 5 or 6, and chroma of 1 or 2
- Texture—silty clay loam or silty clay
- Redoximorphic concentrations and depletions—shades of red, gray, or brown
- Reaction—very strongly acid to slightly acid

Dubbs Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landscape: White River valley
Landform: Natural levee
Parent material: Loamy alluvium
Commonly associated soils: Dundee, Forestdale, and Overcup
Slope range: 0 to 3 percent
Taxonomic class: Fine–silty, mixed, active, thermic Typic Hapludalfs

Typical Pedon

Dubbs silt loam, 0 to 3 percent slopes, in a cultivated field in the NW1/4NW1/4NE1/4 sec. 29 T. 5 S., R. 1 W.

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

Bt1—5 to 22 inches; dark brown (7.5YR 4/4) silty clay loam; moderate medium subangular blocky structure; firm; few fine pores; common fine roots; common faint clay films on faces of peds; common dark manganese concentrations on some faces of peds; strongly acid; gradual smooth boundary.

Bt2—22 to 44 inches; dark brown (7.5YR 4/4) silty clay loam; moderate medium subangular blocky structure; firm; few fine pores; few fine roots; many distinct clay films on faces of peds; common dark manganese concentrations on faces of peds; strongly acid; clear wavy boundary.

BC—44 to 58 inches; dark brown (7.5YR 4/4) loam; weak medium subangular blocky structure; friable; few fine pores; few fine pale brown (10YR 6/3) iron depletions; few dark manganese concentrations on faces of peds; strongly acid; gradual smooth boundary.

C—58 to 80 inches; dark yellowish brown (10YR 4/4) fine sandy loam; massive; friable; common light brownish gray (10YR 6/2) iron depletions; common dark manganese concentrations on faces of peds; few fine hard, cemented iron-manganese concretions; strongly acid.

Range in Characteristics

Solum thickness: 40 to 60 inches

Ap horizon:
- Color—hue of 7.5YR, value of 4, and chroma of 4; or hue of 10YR, value of 4, and chroma of 3 or 4
- Texture—silt loam
- Redoximorphic concentrations and depletions—none
- Reaction—very strongly acid to moderately acid

BA horizon (where present):
- Color—hue of 7.5YR or 10YR, value of 4, and chroma of 4
- Texture—silt loam or loam

Redoximorphic concentrations and depletions—none
Reaction—very strongly acid to moderately acid

Bt horizon:
Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3, 4, or 6
Texture—silty clay loam or clay loam
Redoximorphic concentrations and depletions—shades of brown and black
Reaction—very strongly acid to moderately acid

BC horizon:
Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3, 4, or 6
Texture—very fine sandy loam, silt loam, loam
Redoximorphic concentrations and depletions—shades of brown and gray
Reaction—very strongly acid to moderately acid

C horizon:
Color—hue of 10YR, value of 4 to 6, and chroma of 2 to 4
Texture—loamy sand to fine sandy loam
Redoximorphic concentrations and depletions—shades of brown and gray
Reaction—very strongly acid to moderately acid

Dundee Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Landscape: White River valley
Landform: Natural levee
Parent material: Loamy alluvium
Commonly associated soils: Dubbs, Forestdale, and Overcup
Slope range: 0 to 2 percent
Taxonomic class: Fine–silty, mixed, active, thermic Typic Endoaqualfs

Typical Pedon

Dundee silt loam, 0 to 2 percent slopes, occasionally flooded, in a wooded area in the NE1/4NE1/4NE1/4 sec. 2, T. 7 S., R. 2 W.

A—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam; weak fine subangular blocky structure; friable; few fine pores; many fine and medium roots; moderately acid; clear smooth boundary.

Btg1—4 to 10 inches; dark grayish brown (10YR 4/2) silt loam; moderate medium subangular blocky structure; friable; few fine pores; common fine roots; few faint clay films on faces of peds and lining pores; common distinct dark yellowish brown (10YR 4/4) iron concentrations; common medium cemented iron-manganese concretions; strongly acid; clear wavy boundary.

Btg2—10 to 19 inches; grayish brown (10YR 5/2) silty clay loam; moderate medium subangular blocky structure; firm; few fine pores; common fine roots; common distinct clay films on faces of peds and lining pores; common medium distinct strong brown (7.5YR 5/6) iron concentrations; common medium cemented iron-manganese concretions; strongly acid; clear wavy boundary.

Btg3—19 to 30 inches; dark grayish brown (10YR 4/2) silty clay loam; moderate medium subangular blocky structure; firm; few fine pores; common fine roots; common distinct clay films on faces of peds and lining pores; common medium distinct strong brown (7.5YR 4/6) iron concentrations; common medium iron-manganese concretions; very strongly acid; clear wavy boundary.

Btg4—30 to 40 inches; grayish brown (10YR 5/2) silt loam; moderate medium subangular blocky structure; firm; few fine pores; few fine roots; few distinct clay films on faces of peds and lining pores; common medium distinct strong brown (7.5YR 5/6) iron concentrations; common medium iron-manganese concretions; very strongly acid; clear wavy boundary.

BCg—40 to 60 inches; dark grayish brown (10YR 4/2) loam; weak medium subangular blocky structure; friable; few fine pores; common medium distinct brown (10YR 5/4) iron concentrations; few fine and medium iron-manganese concretions; moderately acid; gradual wavy boundary.

Cg—60 to 72 inches; gray (10YR 6/1) fine sandy loam; structureless, massive; friable; common medium distinct yellowish brown (10YR 5/6) iron concentrations; few medium iron-manganese concretions; moderately acid.

Range in Characteristics

Solum thickness: More than 48 inches

A horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 2 or 3
Texture—silt loam
Redoximorphic concentrations and depletions—none
Reaction—strongly acid or moderately acid

Btg horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 2; or hue of 2.5Y, value of 5, and chroma of 2
Texture—silt loam or silty clay loam

Redoximorphic concentrations and depletions—shades of gray and brown
Reaction—very strongly acid to moderately acid

BCg horizon:
Color—hue of 10YR, value of 4, and chroma of 2, or value of 5 or 6 and chroma of 1 or 2
Texture—silt loam or loam
Redoximorphic concentrations and depletions—shades of gray and brown
Reaction—very strongly acid to moderately acid

Cg horizon:
Color—hue 10YR, value of 5 or 6, and chroma of 1 or 2
Texture—fine sandy loam, silt loam, or loam
Redoximorphic concentrations and depletions—shades of gray or brown
Reaction—very strongly acid to neutral

Ethel Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Slow
Landscape: Grand Prairie upland
Landform: Stream terrace
Parent material: Silty alluvium
Commonly associated soils: Dewitt, Immanuel, and Tichnor
Slope range: 0 to 1 percent
Taxonomic class: Fine-silty, mixed, active, thermic Typic Glossaqualfs

Typical Pedon

Ethel silt loam, 0 to 1 percent slopes, in a cultivated field in the SW1/4SE1/4NE1/4 sec. 29, T. 4 S., R. 1 W.

Ap—0 to 5 inches; grayish brown (10YR 5/2) silt loam; moderate coarse subangular blocky parting to fine and medium granular structure; friable; common fine and medium pores; many fine and medium roots; many fine and medium distinct brown to dark brown (7.5YR 4/4) iron concentrations; common fine cemented iron-manganese concretions; common fine dark brown soft iron-manganese masses; slightly acid; abrupt smooth boundary.

Eg1—5 to 13 inches; gray (10YR 5/1) silt loam; moderate medium and coarse subangular blocky structure; friable; common fine pores; common fine roots; common fine and medium distinct strong brown (7.5YR 4/6) iron concentrations on faces of peds and lining pores; few medium distinct dark brown (7.5YR 3/2) manganese concentrations on faces of peds; common fine and medium yellow to brown soft iron-manganese masses; common fine and medium brown to black cemented iron-manganese concretions; neutral; clear smooth boundary.

Eg2—13 to 24 inches; light brownish gray (10YR 6/2) silt loam; moderate medium and coarse subangular blocky parting to moderate fine subangular blocky structure; friable; many fine, medium, and coarse pores; few fine roots; few medium and coarse distinct yellowish brown (10YR 5/6) iron concentrations; common medium distinct dark brown (10YR 3/3) manganese concentrations on faces of peds; common fine and medium yellow to brown soft iron-manganese masses on faces of peds and lining pores; common fine and medium dark brown to black cemented iron-manganese concretions; strongly acid; clear smooth boundary.

Btg1/Eg—24 to 38 inches; 60 percent (Btg) dark gray (10YR 4/1) silty clay loam; weak coarse and very coarse prismatic parting to moderate medium and coarse subangular blocky structure; firm; common fine pores; few fine roots mainly between prisms; many distinct clay films on faces of peds and lining pores; some pores lined with dark brown (7.5YR 3/3) clay films; few medium distinct yellowish brown (10YR 5/6) iron concentrations; many fine and medium dark brown to black iron-manganese concretions; common fine and medium yellow to brown soft iron-manganese masses; 40 percent (Eg) light brownish gray (10YR 6/2) silt; massive; many fine and medium dark brown to black cemented iron-manganese concretions; many fine and medium yellow to brown soft iron-manganese masses; very strongly acid; gradual wavy boundary.

Btg2/Eg—38 to 52 inches; 85 percent (Btg) grayish brown (10YR 5/2) silty clay loam; moderate coarse and very coarse prismatic parting to moderate medium and coarse subangular blocky structure; firm; common fine pores; many distinct clay films on faces of peds and lining pores; many medium faint yellowish brown (10YR 5/4 and 10YR 5/6) iron concentrations; few medium and coarse faint dark gray (10YR 4/1) iron depletions; many fine, medium, and coarse dark brown to black cemented iron-manganese concretions; many fine, medium, and coarse yellow to brown soft iron-manganese masses; 15 percent (Eg) light brownish gray (10YR 6/2) silt; massive; many fine, medium, and coarse dark brown to black cemented iron-manganese concretions; many fine, medium, and coarse yellow to brown soft iron-manganese masses; very strongly acid; gradual smooth boundary.

Btg1—52 to 64 inches; grayish brown (10YR 5/2) silty clay loam; moderate coarse and very coarse prismatic parting to moderate medium and coarse subangular blocky structure; firm; common fine pores; common distinct clay films on faces of peds and lining pores; common faint light brownish gray (10YR 6/2) clay depletions between prisms; many medium faint yellowish brown (10YR 5/4 and 5/6) and few medium distinct dark yellowish brown (10YR 4/4) iron concentrations; few medium black manganese concentrations on faces of peds; many fine and medium dark brown to black cemented iron-manganese concretions; common fine and medium yellow to brown soft iron-manganese masses; strongly acid; gradual smooth boundary.

Btg2—64 to 80 inches; grayish brown (10YR 5/2) silty clay loam; moderate coarse and very coarse prismatic parting to moderate medium and coarse subangular blocky structure; firm; common fine pores; many distinct clay films on faces of peds and lining pores; few faint light brownish gray (10YR 6/2) clay depletions between prisms; many medium and coarse faint yellowish brown (10YR 5/4 and 10YR 5/6) and few medium distinct brown (7.5YR 4/4) iron concentrations; common medium black manganese concentrations on prisms, faces of peds, and lining pores; few fine and medium dark brown to black cemented iron-manganese concretions; few yellow to brown soft iron-manganese masses; strongly acid.

Range in Characteristics

Solum thickness: More than 60 inches

Ap horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 2
Texture—silt loam
Redoximorphic concentrations and depletions—shades of brown
Reaction—strongly acid or moderately acid, except where limed or irrigated

Eg horizon and Eg part of the Btg/Eg horizon:
Color—hue of 10YR, value of 5 or 6, and chroma of 1 or 2, or value of 7 and chroma of 1
Texture—silt or silt loam
Redoximorphic concentrations and depletions—shades of brown or yellow
Reaction—strongly acid or moderately acid, except where limed or irrigated

Btg horizon and Btg part of the Btg/Eg horizon:
Color—hue of 10YR, value of 4 to 6, and chroma of 1 or 2; or hue of 2.5Y, value of 6, and chroma of 2
Texture—silt loam or silty clay loam
Redoximorphic concentrations and depletions—shades of brown, yellow, and gray
Reaction—very strongly acid to moderately acid

BCg horizon (where present):
Color—hue of 10YR, value of 6, and chroma of 1; or hue of 2.5Y, value of 6, and chroma of 2
Texture—silt loam or silty clay loam
Redoximorphic concentrations and depletions—shades of brown, yellow, and gray
Reaction—very strongly acid to moderately acid

C horizon (where present):
Color—hue of 10YR, value of 6, and chroma of 2
Texture—silt loam or silty clay loam
Redoximorphic concentrations and depletions—shades of brown, yellow, and gray
Reaction—very strongly acid to moderately acid

Forestdale Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Very slow
Landscape: White River valley
Landform: Stream terrace
Parent material: Clayey alluvium
Commonly associated soils: Dubbs, Dundee, and Overcup
Slope range: 0 to 1 percent
Taxonomic class: Fine, smectitic, thermic Typic Endoaqualfs

Typical Pedon

Forestdale silty clay loam, 0 to 1 percent slope, frequently flooded, in a cultivated field in the SE$^1/_4$NE$^1/_4$SE$^1/_4$ sec. 34, T. 7 S., R. 2 W.

Ap—0 to 5 inches; dark grayish brown (10YR 4/2) silty clay loam; weak fine granular structure; friable; common fine and common medium pores; common fine roots; moderately acid; abrupt smooth boundary.

Btg1—5 to 20 inches; light gray (10YR 6/1) silty clay; moderate medium subangular blocky structure; firm; common fine pores; few fine and medium roots; common distinct clay films on faces of peds; common medium distinct strong brown (7.5YR 5/6) and yellowish brown (10YR 5/6) iron concentrations; few fine black and brown cemented iron-manganese concretions; strongly acid; gradual wavy boundary.

Btg2—20 to 39 inches; gray (10YR 5/1) silty clay; moderate medium subangular blocky structure; firm; common distinct clay films on faces of peds; common fine pores; few fine roots; common medium distinct strong brown (7.5YR 5/6) iron concentrations; few fine and medium black cemented iron-manganese concretions; strongly acid; gradual wavy boundary.

Btg3—39 to 60 inches; light brownish gray (10YR 6/2) silty clay loam; moderate medium subangular blocky structure; very firm; common fine pores; common distinct clay films on faces of peds; common medium distinct yellowish brown (10YR 5/6) iron concentrations; common fine black cemented iron-manganese concretions; strongly acid; gradual wavy boundary.

BCg—60 to 80 inches; grayish brown (2.5Y 5/2) silty clay loam; weak medium subangular blocky structure; firm; few fine pores; common medium distinct yellowish brown (10YR 5/6) iron concentrations; common fine black iron-manganese concretions; moderately acid.

Range in Characteristics

Solum thickness: More than 60 inches

Ap horizon:

Color—hue of 10YR, value of 4, and chroma of 1 or 2, or value of 5 and chroma of 2
Texture—silty clay loam
Redoximorphic concentrations and depletions—none
Reaction—strongly acid or moderately acid

Btg horizon (upper part):

Color—hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2
Texture—silty clay or clay
Redoximorphic concentrations and depletions—shades of yellow and brown
Reaction—very strongly acid to moderately acid

Btg horizon (lower part):

Color—hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2
Texture—silt loam or silty clay loam
Redoximorphic concentrations and depletions—shades of yellow and brown
Reaction—very strongly acid to moderately acid

BCg horizon:

Color—hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2
Texture—silt loam or silty clay loam
Redoximorphic concentrations and depletions—shades of yellow and brown
Reaction—strongly acid or moderately acid

Cg horizon: (where present):

Color—hue of 10YR, value of 5 or 6, and chroma of 1 or 2; or hue of 2.5Y, value of 5, and chroma of 2
Texture—silt loam
Redoximorphic concentrations and depletions—shades of yellow and brown
Reaction—strongly acid to slightly alkaline

Hebert Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Landscape: Arkansas River valley
Landform: Natural levee
Parent material: Silty alluvium
Commonly associated soils: Keo, Perry, Portland, and Rilla
Slope range: 0 to 1 percent
Taxonomic class: Fine-silty, mixed, active, thermic Aeric Epiaqualfs

Typical Pedon

Hebert silt loam, 0 to 1 percent slopes, in a wooded area in the SE$^1/_4$SW$^1/_4$SE$^1/_4$ sec. 2, T. 5 S., R. 6 W.

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

Bt1—4 to 12 inches; brown (7.5YR 5/4) silt loam; grayish brown (10YR 5/2) iron depletions along ped surfaces; weak fine subangular blocky structure; friable; patchy clay coatings along ped surfaces; light brownish gray (10YR 6/2) clay depletions; common fine roots; very strongly acid; clear wavy boundary.

Bt2—12 to 20 inches; brown (10YR 5/3) silt loam; weak medium subangular blocky structure; friable; patchy clay coatings on ped surfaces; light brownish gray (10YR 6/2) clay depletions; few fine roots; iron depletions along ped surfaces; common iron-manganese concretions within peds; very strongly acid; clear wavy boundary.

Bt3—20 to 34 inches; reddish brown (5YR 5/4) silty clay loam; light brownish gray (10YR 6/2) clay depletions on ped surfaces; moderate medium subangular blocky structure; firm; continuous clay coatings on ped surfaces; iron depletions along ped surfaces; common iron-manganese concretions within peds; very strongly acid; clear wavy boundary.

Bt4—34 to 50 inches; reddish brown (5YR 4/4) silty clay loam; faint grayish brown (10YR 5/2) clay depletions on peds; moderate medium subangular blocky structure; firm; continuous clay coatings on ped surfaces; few iron-manganese concretions within peds; strongly acid; gradual smooth boundary.

C—50 to 72 inches; brown (7.5YR 5/4) silt loam; massive; moderately acid.

Range in Characteristics

Solum thickness: 36 to 72 inches

A horizon:
- Color—hue of 10YR, value of 4 or 5, and chroma of 2 or 3
- Texture—silt loam
- Redoximorphic concentrations and depletions—none
- Reaction—strongly acid to slightly acid

E horizon (where present):
- Color—hue of 10YR, value of 5 or 6, and chroma of 1 or 2
- Texture—silt loam
- Redoximorphic concentrations and depletions—none
- Reaction—strongly acid to slightly acid

Bt horizon:
- Color—hue of 5YR, value of 4 or 5, and chroma of 3 or 4; or hue of 7.5YR, value of 4 or 5, and chroma of 4; or hue of 10YR, value of 4 or 5, and chroma of 3
- Texture—silt loam or silty clay loam
- Redoximorphic concentrations and depletions—shades of brown, red, and gray
- Reaction—very strongly acid to slightly acid

C horizon:
- Color—hue of 5YR, value of 4 or 5, and chroma of 3 or 4; or hue of 7.5YR, value of 4 or 5, and chroma of 4
- Texture—very fine sandy loam, silt loam, or silty clay loam
- Redoximorphic concentrations and depletions—none
- Reaction—strongly acid to slightly alkaline

Immanuel Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate above the fragic layer and slow in the fragic layer
Landscape: Grand Prairie upland
Landform: Terrace
Parent material: Loess influenced alluvium
Commonly associated soils: Ethel, Muskogee, Oaklimeter, Stuttgart, and Tichnor
Slope range: 0 to 8 percent
Taxonomic class: Fine-silty, mixed, active, thermic Fragic Oxyaquic Hapludalfs

Typical Pedon

Immanuel silt loam, 3 to 8 percent slopes, in a grassland field, 300 feet west of Menard Cemetery, Land Grant No. 2351, T. 8 S., R. 2 W.

Ap—0 to 7 inches; brown (10YR 4/3) silt loam; moderate medium and coarse subangular blocky structure parting to moderate fine and medium granular; friable; many fine roots; common fine pores; few medium faint brown (10YR 5/3) iron depletions; few fine hard black iron-manganese concretions; moderately acid; abrupt smooth boundary.

Bt1—7 to 18 inches; strong brown (7.5YR 4/6) silty clay loam; moderate medium and coarse subangular blocky structure; friable; common fine pores; common fine roots; occasional faint clay film on a few ped surfaces; common coarse distinct brown (10YR 4/3) accumulations (A horizon material); few fine distinct black (10YR 2/1) manganese concentrations on faces of some peds; few fine, medium, and coarse iron-manganese concretions; strongly acid; gradual smooth boundary.

Bt2—18 to 28 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium and coarse subangular blocky structure; friable; common fine roots; many fine and medium pores; few faint clay films on a faces of peds and lining some pores; common coarse faint brown (10YR 5/3) and few fine faint grayish brown (10YR 5/2) iron depletions; few medium faint yellowish brown (10YR 5/6) iron concentrations; common fine and medium dark brown to black soft iron-manganese masses; strongly acid; gradual smooth boundary.

Eg—28 to 33 inches; light brownish gray (10YR 6/2) silt loam; weak coarse subangular blocky structure; friable; many fine, medium, and coarse pores; common fine roots; many fine distinct yellowish brown (10YR 5/4) iron concentrations; many medium and coarse dark brown to black soft iron-manganese masses; strongly acid; clear smooth boundary.

B´tx/Eg—33 to 53 inches; 60 percent (B´tx) yellowish brown (10YR 5/4) silt loam; moderate medium, coarse, and very coarse prismatic structure parting to moderate medium and coarse subangular blocky; firm; most peds slightly brittle; few fine roots; common fine and medium pores; common distinct brown (7.5YR 5/3) clay films on faces of peds and lining pores; common medium faint yellowish brown (10YR 5/6) and few fine distinct strong brown (7.5YR 5/6) iron concentrations; common fine faint brown (10YR 5/3) iron depletions; few light brownish gray (10YR 6/2) iron depletion halos around pores in brown matrix; common fine, medium, and coarse dark brown to black soft iron-manganese masses in upper 4 inches of horizon; 40 percent (Eg) light brownish gray (10YR 6/2) silt in seams up to 2 inches wide between prisms; weak coarse subangular blocky to massive structure; few fine roots in gray silt; common fine pores in gray silt; occasional pores lined with black manganese concentrations; strongly acid; gradual smooth boundary.

B´t—53 to 80 inches; yellowish brown (10YR 5/4) silt loam; moderate medium, coarse, and very coarse prismatic structure parting to moderate medium and coarse subangular blocky; firm, slightly brittle; common fine and medium pores; common distinct clay films on faces of peds and lining pores; common fine faint brown (10YR 5/3) iron depletions; common medium faint yellowish brown (10YR 5/6) and few fine distinct strong brown (7.5YR 5/6) iron concentrations; few fine, medium, and coarse dark brown to black soft iron-manganese masses; about 10 percent of horizon is composed of light brownish gray (10YR 6/2) clay depletions between prisms; strongly acid.

Range in Characteristics

Solum thickness: More than 60 inches

Ap horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 3 or 4
Texture—silt loam
Redoximorphic concentrations and depletions—shades of brown
Reaction—strongly acid or moderately acid

Bt horizon:
Color—hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4, 6, or 8
Texture—silt loam or silty clay loam
Redoximorphic concentrations and depletions—shades of brown and gray
Reaction—very strongly acid or strongly acid

Eg horizon:
Color—hue of 10YR, value of 6 or 7, and chroma of 1 or 2
Texture—silt or silt loam
Redoximorphic concentrations and depletions—shades of brown
Reaction—very strongly acid or strongly acid

B´tx/Eg horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 4, 6, or 8; or hue of 5YR, value of 4 or 5, and chroma of 4 or 6
Texture—silt loam or silty clay loam
Redoximorphic concentrations and depletions—shades of brown and gray
Reaction—very strongly acid or strongly acid

B´t horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 3, 4, or 6
Texture—silt loam or silty clay loam
Redoximorphic concentrations and depletions—shades of gray and brown, or variegated shades of brown, yellow, or gray
Reaction—very strongly acid to slightly acid

Keo Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landscape: Arkansas River valley
Landform: Natural levee
Parent material: Loamy alluvium
Commonly associated soils: Crevasse, Desha, Hebert, Perry, and Portland
Slope range: 0 to 6 percent
Taxonomic class: Coarse-silty, mixed, active, thermic Dystric Fluventic Eutrudepts

Typical Pedon

Keo loam, 0 to 1 percent slopes, occasionally flooded, in a hay field in the NW$^1/_4$NE$^1/_4$SW$^1/_4$ sec. 19, T. 8 S., R. 2 W.

Ap—0 to 5 inches; dark brown (7.5YR 4/4) loam; weak fine granular structure; very friable; common fine and medium roots; slightly acid; abrupt smooth boundary.

Bw1—5 to 19 inches; reddish brown (5YR 4/4) very fine sandy loam; weak fine subangular blocky structure; friable; common fine and medium pores; few fine roots; neutral; clear wavy boundary.

Bw2—19 to 31 inches; reddish brown (5YR 4/3) silt loam; weak fine subangular blocky structure;

friable; common fine and medium pores; few fine roots; neutral; clear smooth boundary.

Bw3—31 to 39 inches; dark reddish brown (5YR 3/3) silt loam; weak fine subangular blocky structure; friable; common fine pores; few fine roots; neutral; clear smooth boundary.

2Ab—39 to 47 inches; reddish brown (5YR 4/3) silt loam; weak medium subangular blocky structure; friable; common very fine and fine pores; few fine roots; moderately alkaline; clear smooth boundary.

2C1—47 to 60 inches; dark reddish brown (5YR 3/3) silty clay loam; massive; firm; common fine pores; slightly alkaline; clear smooth boundary.

3C2—60 to 80 inches; reddish brown (5YR 4/3) loam; massive, with bedding planes; few fine pores; friable; moderately alkaline.

Range in Characteristics

Solum thickness: 28 to 50 inches

Ap horizon:
- Color—hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 2 to 4
- Texture—loam
- Redoximorphic concentrations and depletions—none
- Reaction—slightly acid to slightly alkaline

Bw horizon:
- Color—hue of 5YR, value of 3 or 4, and chroma of 3 or 4; or hue of 7.5YR, value of 4, and chroma of 4
- Texture—very fine sandy loam or silt loam
- Redoximorphic concentrations and depletions—none
- Reaction—neutral to moderately alkaline

2Ab horizon:
- Color—hue of 5YR, value of 3 or 4, and chroma of 3 or 4, or value of 3 and chroma of 2; or hue of 7.5YR, value of 4, and chroma of 4
- Texture—silt loam or silty clay loam
- Redoximorphic concentrations and depletions—none
- Reaction—neutral to moderately alkaline

2C horizon and 3C horizon:
- Color—hue of 5YR, value of 3 or 4, and chroma of 3 or 4; or hue of 7.5YR, value of 4, and chroma of 3 or 4
- Texture—fine sandy loam, silt loam, loam, or silty clay loam
- Redoximorphic concentrations and depletions—none
- Reaction—neutral to moderately alkaline

Kobel Series

Depth class: Very deep
Drainage class: Poorly drained and very poorly drained
Permeability: Very slow
Landscape: White River valley
Landform: Backswamp
Parent material: Clayey alluvium
Commonly associated soils: Yancopin
Slope range: 0 to 3 percent
Taxonomic class: Fine, smectitic, nonacid, thermic Vertic Endoaquepts

Typical Pedon

Kobel silty clay, 0 to 1 percent slopes, frequently flooded, in a wooded area in the NE$^1/_4$NE$^1/_4$NW$^1/_4$ sec. 3, T. 6 S., R. 1 W.

A—0 to 5 inches; dark grayish brown (10YR 4/2) silty clay; weak fine subangular blocky structure; firm; common very fine and fine pores; common fine and medium roots; moderately acid; clear smooth boundary.

Bg1—5 to 21 inches; gray (10YR 5/1) clay; moderate medium subangular blocky structure; firm, plastic; common very fine and fine pores; few fine roots; common medium distinct yellowish brown (10YR 5/6) and dark yellowish brown (10YR 4/4) iron concentrations; few fine cemented iron-manganese concretions; slightly acid; gradual smooth boundary.

Bg2—21 to 40 inches; gray (10YR 5/1) clay; moderate medium subangular blocky structure; firm, plastic; common fine pores; few fine roots; few slickensides that do not intersect; common medium distinct yellowish brown (10YR 5/6) and dark yellowish brown (10YR 4/4) iron concentrations; few fine cemented iron-manganese concretions; neutral; gradual wavy boundary.

Bg3—40 to 54 inches; gray (10YR 5/1) clay; moderate medium subangular blocky structure; firm, plastic; common fine pores; few fine roots; few slickensides that do not intersect; common medium distinct strong brown (7.5YR 5/6) iron concentrations; few fine cemented iron-manganese concretions; neutral; gradual wavy boundary.

Cg—54 to 72 inches; gray (10YR 5/1) silty clay loam; structureless, massive; firm; common fine pores; common medium distinct strong brown (7.5YR 5/6) iron concentrations; common fine and medium cemented iron-manganese concretions; neutral.

Range in Characteristics

Solum thickness: 42 to 60 inches

A horizon:
Color—hue of 10YR, value 3 or 4, and chroma of 1 or 2
Texture—silty clay
Redoximorphic concentrations and depletions—none
Reaction—moderately acid to neutral

Bg horizon (upper part):
Color—hue of 10YR, value of 4 to 6, and chroma of 1
Texture—silty clay or clay
Redoximorphic concentrations and depletions—shades of brown, gray, red, or yellow
Reaction—slightly acid to slightly alkaline

Bg horizon (lower part):
Color—hue of 10YR, value of 4 to 6, and chroma of 1
Texture—silty clay loam or clay
Redoximorphic concentrations and depletions—shades of brown, gray, red, or yellow
Reaction—slightly acid to slightly alkaline

Cg horizon:
Color—hue of 10YR, value of 4 to 6, and chroma of 1
Texture—silty clay loam, silty clay, or clay
Redoximorphic concentrations and depletions—shades of brown, red, or gray
Reaction—neutral to moderately alkaline

Lagrue Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Very slow
Landscape: Grand Prairie upland
Landform: Depression
Parent material: Clayey alluvium
Commonly associated soils: Dewitt, Stuttgart, and Tichnor
Slope range: 0 to 1 percent
Taxonomic class: Fine, smectitic, thermic Typic Epiaqualfs

Typical Pedon

Lagrue silty clay loam, 0 to 1 percent slopes, in a cultivated field in the NE1/4NE1/4NW1/4 sec. 26, T. 2 S., R. 5 W.

Ap—0 to 4 inches; dark grayish brown (10YR 4/2) silty clay loam; weak medium granular structure; friable; common fine and medium pores; common fine roots; common fine distinct strong brown (7.5YR 5/6 and 5/8) iron concentrations in matrix; common fine iron-manganese concretions; strongly acid; abrupt smooth boundary.

Btg1—4 to 11 inches; gray (10YR 5/1) silty clay loam; moderate medium subangular blocky structure; firm; common fine pores; few fine roots; many prominent clay films on faces of peds and lining pores; common medium distinct strong brown (7.5YR 5/6 and 5/8) iron concentrations in matrix and lining some pores; common fine iron-manganese concretions; common fine black (10YR 2/1) soft manganese masses in matrix; strongly acid; clear smooth boundary.

Btg2—11 to 30 inches; gray (10YR 6/1) silty clay; moderate medium subangular blocky structure; firm; few fine pores; few fine roots; many prominent clay films on faces of peds and lining pores; common medium prominent yellowish red (5YR 5/8) and common medium distinct strong brown (7.5YR 5/8) iron concentrations in matrix; common fine iron-manganese concretions; common fine black (10YR 2/1) soft manganese masses in matrix; extremely acid; clear smooth boundary.

Btg3—30 to 63 inches; light brownish gray (2.5Y 6/2) silty clay; moderate medium subangular blocky structure; firm; common fine pores; few fine roots; many prominent clay films on faces of peds and lining pores; common medium prominent yellowish red (5YR 5/8) and common medium distinct strong brown (7.5YR 5/8) iron concentrations in matrix; common medium distinct gray (10YR 6/1) iron depletions; common fine and medium iron-manganese concretions; common fine black (10YR 2/1) soft manganese masses in matrix; extremely acid; gradual smooth boundary.

Btg4—63 to 80 inches; grayish brown (2.5Y 5/2) silty clay; moderate medium subangular blocky structure; firm; few fine pores; many prominent clay films on faces of peds and lining pores; common medium distinct brown (10YR 5/3) and strong brown (7.5YR 5/8) iron concentrations in matrix; common medium distinct gray (10YR 6/1) iron depletions; common fine and medium iron-manganese concretions; common fine black (10YR 2/1) soft manganese masses in matrix; very strongly acid.

Range in Characteristics

Solum thickness: More than 60 inches

A or Ap horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 1 or 2
Texture—silty clay loam
Redoximorphic concentrations and depletions—shades of yellow, brown, or gray
Reaction—strongly acid to neutral

Btg horizon:
Color—hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2
Texture—silty clay loam, silty clay, or clay
Redoximorphic concentrations and depletions—shades of yellow, brown, gray, or red
Reaction—extremely acid to moderately acid

Muskogee Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Slow
Landscape: Grand Prairie upland
Landform: Terrace
Parent material: Loess influenced alluvium
Commonly associated soils: Dewitt, Immanuel, Stuttgart, and Tichnor
Slope range: 1 to 15 percent
Taxonomic class: Fine–silty, mixed, active, thermic Aquic Paleudalfs

Typical Pedon

Muskogee silt loam, 3 to 8 percent slopes, located in the SW$^1/_4$SE$^1/_4$SE$^1/_4$ sec. 5, T. 5 S., R. 3 W.

Ap—0 to 5 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; friable; common fine pores; many very fine and fine roots; slightly acid; clear smooth boundary.

Bt1—5 to 10 inches; yellowish brown (10YR 5/6) silty clay loam; weak medium subangular blocky structure; friable; few fine and medium pores; many very fine and fine roots; common distinct clay films on faces of peds and lining some pores; few fine distinct yellowish red (5YR 5/6) iron concentrations; strongly acid; clear smooth boundary.

Bt2—10 to 16 inches; yellowish brown (10YR 5/6) silty clay; moderate medium subangular blocky structure; friable; few fine pores; common very fine and fine roots; common distinct clay films on faces of peds and lining some pores; common medium distinct yellowish red (5YR 5/6), few medium distinct strong brown (7.5YR 5/6), and few medium prominent red (2.5YR 4/8) iron concentrations; few medium distinct light gray (10YR 7/2) iron depletions; strongly acid; clear smooth boundary.

Bt3—16 to 29 inches; yellowish brown (10YR 5/6) silty clay; moderate medium subangular blocky structure; friable; common fine pores; few very fine and fine roots; many distinct clay films on faces of ped and lining pores; few fine distinct yellowish red (5YR 5/6) iron concentrations; common medium distinct light gray (10YR 7/2) iron depletions; strongly acid; gradual smooth boundary.

Bt4—29 to 41 inches; 40 percent yellowish brown (10YR 5/6), 30 percent light gray (10YR 7/2), and 30 percent red (2.5YR 5/6) silty clay; moderate medium subangular blocky structure; firm; common fine pores; few fine roots; many distinct clay films on faces of peds and lining pores; moderately acid; gradual smooth boundary.

Bt5—41 to 53 inches; yellowish red (5YR 5/6) silty clay; moderate medium angular blocky structure; firm; common fine pores; few very fine roots; many distinct clay films on faces of peds and lining pores; common medium distinct strong brown (7.5YR 5/8) iron concentrations; few medium distinct light yellowish brown (10YR 6/4) and common medium distinct light gray (10YR 7/2) iron depletions; slightly acid; gradual smooth boundary.

Bt6—53 to 60 inches; red (2.5YR 4/6) silty clay; moderate medium angular blocky structure; firm; common fine pores; many distinct clay films on faces of peds; common medium distinct strong brown (7.5YR 5/6) iron concentrations; common medium black manganese concentrations on faces of peds; neutral; gradual smooth boundary.

Btss1—60 to 72 inches; red (2.5YR 4/6) clay; moderate medium angular blocky structure; firm; common intersecting slickensides; neutral; diffuse boundary.

Btss2—72 to 90 inches; red (2.5YR 4/6) clay; moderate medium angular blocky structure; firm; common intersecting slickensides; few white (10YR 8/1) clay depletions on faces of peds and on slickensides; slightly alkaline.

Range in Characteristics

Solum thickness: More than 60 inches

A or Ap horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 2 or 3
Texture—silt loam
Redoximorphic concentrations and depletions—none
Reaction—strongly acid to slightly acid

E horizon (where present):
Color—hue of 10YR, value of 5 or 6, and chroma of 2 to 4
Texture—silt loam
Redoximorphic concentrations and depletions—none
Reaction—strongly acid to slightly acid

Bt horizon (upper part):
Color—hue of 7.5YR or 10YR, value of 5, and chroma of 6 or 8
Texture—silty clay loam or silty clay
Redoximorphic concentrations and depletions—shades of brown, gray, and red
Reaction—strongly acid to slightly acid

Bt horizon (lower part):
Color—hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 6 or 8
Texture—silty clay or clay
Redoximorphic concentrations and depletions—shades of brown and gray
Reaction—moderately acid to moderately alkaline

Btss horizon:
Color—hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 6 or 8
Texture—clay
Redoximorphic concentrations and depletions—shades of white
Reaction—neutral or slightly alkaline

BC horizon and C horizon (where present):
Color—hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 6 or 8
Texture—silty clay or clay
Redoximorphic concentrations and depletions—shades of brown and gray
Reaction—moderately acid to moderately alkaline

Oaklimeter Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate
Landscape: Grand Prairie upland
Landform: Flood plain
Parent material: Silty alluvium
Commonly associated soils: Immanuel and Tichnor
Slope range: 0 to 1 percent
Taxonomic class: Coarse-silty, mixed, active, thermic Fluvaquentic Dystrudepts

Typical Pedon

Oaklimeter silt loam, 0 to 1 percent slopes, occasionally flooded, in an idle field in the SE1/4NW1/4NW1/4 sec. 27, T. 3 S., R. 3 W.

Ap—0 to 8 inches; brown (10YR 4/3) silt loam; weak fine granular structure; friable; common fine roots; moderately acid; clear smooth boundary.

Bw1—8 to 21 inches; brown (10YR 5/3) silt loam; weak medium subangular blocky structure; friable; common very fine and fine pores; common fine roots; common medium distinct brown (10YR 4/3), yellowish brown (10YR 6/4), and strong brown (7.5YR 5/8) iron concentrations; strongly acid; gradual wavy boundary.

Bw2—21 to 40 inches; yellowish brown (10YR 5/4) silt loam; weak medium subangular blocky structure; friable; common fine pores; few fine roots; common medium distinct brown (10YR 4/3) and yellowish brown (10YR 5/4, 5/6) iron concentrations; few fine distinct grayish brown (10YR 5/2) iron depletions; very strongly acid; gradual wavy boundary.

BEb—40 to 55 inches; yellowish brown (10YR 5/4) silt loam; moderate medium subangular blocky structure; firm, dense, compact; few fine pores; common medium distinct yellowish brown (10YR 5/6) and brown (10YR 4/3) iron concentrations; common medium light brownish gray (10YR 6/2) and light gray (10YR 7/2) iron depletions; few fine cemented iron-manganese concretions; very strongly acid; gradual wavy boundary.

Btgb—55 to 72 inches; grayish brown (10YR 5/2) silt loam; weak very coarse prismatic structure parting to moderate medium subangular blocky; firm; few fine pores; few faint clay films on faces of peds and lining pores; common medium clay depletions between prisms; common fine distinct yellowish brown (10YR 5/4) and brown (10YR 4/3) iron concentrations; common medium distinct light gray (10YR 7/2) iron depletions; few fine cemented iron-manganese; very strongly acid.

Range in Characteristics

Solum thickness: 60 to 80 inches

Ap horizon:
Color—hue of 10YR, value of 4, and chroma of 3 or 4
Texture—silt loam
Redoximorphic concentrations and depletions—none
Reaction—very strongly acid to moderately acid

Bw horizon:
Color—hue of 7.5YR, value of 4, and chroma of 4; or hue of 10YR, value of 4 or 5, and chroma of 3 or 4

Texture—very fine sandy loam, silt loam, or loam
Redoximorphic concentrations and depletions—shades of brown and gray
Reaction—very strongly acid or strongly acid

BEb horizon:
Color—hue of 10YR, value of 5 or 6, and chroma of 2 to 4
Texture—silt loam or loam
Redoximorphic concentrations and depletions—shades of brown and gray
Reaction—very strongly acid or strongly acid

Btgb horizon:
Color—hue of 10YR, value of 5 or 6, and chroma of 1 or 2; or hue of 2.5Y, value of 5, and chroma of 2
Texture—silt loam or silty clay loam
Redoximorphic concentrations and depletions—shades of brown and gray
Reaction—very strongly acid or strongly acid

Overcup Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Very slow
Landscape: White River valley
Landform: Stream terrace
Parent material: Clayey alluvium
Commonly associated soils: Dubbs, Dundee, and Forestdale
Slope range: 0 to 1 percent
Taxonomic class: Fine, smectitic, thermic Vertic Albaqualfs

Typical Pedon

Overcup silt loam, 0 to 1 percent slopes, in a wooded area in the SE$^1/_4$NW$^1/_4$SE$^1/_4$ sec. 20, T. 5 S., R. 1 W.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam; weak medium and coarse subangular blocky structure; firm; common very fine and fine pores; common very fine and fine roots; many fine and medium weakly cemented iron-manganese concretions; strongly acid; abrupt smooth boundary.

Eg—8 to 14 inches; light gray (10YR 7/1) silt loam; weak coarse subangular blocky structure; firm; common fine pores; few very fine and fine roots; common medium distinct yellowish brown (10YR 5/6) iron concentrations; many fine and medium weakly cemented iron-manganese concretions; very strongly acid; clear wavy boundary.

Btg1—14 to 40 inches; grayish brown (10YR 5/2) clay; moderate fine angular blocky structure; firm; plastic and sticky; common very fine and fine pores; few very fine and fine roots; many prominent clay films on faces of peds and lining pores; few slickensides that do not intersect; common fine and medium distinct yellowish brown (10YR 5/6) iron concentrations; common fine and medium weakly cemented iron-manganese concretions; very strongly acid; gradual smooth boundary.

Btg2—40 to 60 inches; grayish brown (10YR 5/2) silty clay; moderate fine and medium subangular blocky structure; firm; slightly sticky and slightly plastic; common very fine and fine pores; few very fine and fine roots; many prominent clay films on faces of peds and lining most pores; few medium distinct yellowish brown (10YR 5/6) iron concentrations; common fine and medium cemented iron-manganese concretions; few medium black manganese concentrations of faces of peds; strongly acid; gradual smooth boundary.

BCg—60 to 72 inches; light brownish gray (10YR 6/2) silty clay loam; weak medium subangular blocky structure; firm; common very fine and fine pores; common medium distinct dark yellowish brown (10YR 4/4) iron concentrations; common fine and medium weakly cemented iron-manganese concretions; many medium and coarse black manganese concentrations on faces of peds; slightly alkaline.

Range in Characteristics

Solum thickness: More than 60 inches

A or Ap horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 2 or 3
Texture—silt loam
Redoximorphic concentrations and depletions—none
Reaction—strongly acid or moderately acid

Eg horizon:
Color—hue of 10YR, value of 5 to 7, and chroma of 1 or 2
Texture—silt loam
Redoximorphic concentrations and depletions—shades of brown
Reaction—very strongly acid to moderately acid

Btg horizon:
Color—hue of 10YR, value of 5 or 6, and chroma of 1 or 2; or hue of 2.5Y, value of 5, and chroma of 2

Texture—silty clay or clay
Redoximorphic concentrations and depletions—shades of brown or gray
Reaction—very strongly acid to slightly acid

BCg horizon:
Color—hue of 10YR, value of 5 or 6, and chroma of 1 or 2; or hue of 2.5Y, value of 5, and chroma of 2
Texture—silty clay loam or silty clay
Redoximorphic concentrations and depletions—shades of brown, yellow, or gray
Reaction—moderately acid to moderately alkaline

Cg horizon (where present):
Color—hue of 10YR, value of 5 or 6, and chroma of 1 or 2; or hue of 2.5Y, value of 5, and chroma of 2
Texture—silt loam or silty clay loam
Redoximorphic concentrations and depletions—shades of brown, yellow, or gray
Reaction—moderately acid to moderately alkaline

Perry Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Very slow
Landscape: Arkansas River valley
Landform: Backswamp
Parent material: Clayey alluvium
Commonly associated soils: Desha, Hebert, Keo, Portland, Rilla, and Yorktown
Slope range: 0 to 1 percent
Taxonomic class: Very-fine, smectitic, thermic Chromic Epiaquerts

Typical Pedon

Perry clay, 0 to 1 percent slopes, in a cultivated field in the SE1/4NE1/4SW1/4 sec. 22, T. 3 S, R. 6 W.

Ap—0 to 4 inches; dark grayish brown (10YR 4/2) clay; strong fine granular structure; friable; common fine pores; many fine roots; common fine dark cemented iron-manganese concretions; strongly acid; abrupt smooth boundary.

Bssg1—4 to 13 inches; gray (10YR 5/1) clay; strong medium subangular blocky structure; firm; common fine pores; few fine roots; few slickensides that do not intersect; common medium distinct strong brown (10YR 4/6) iron concentrations; common dark cemented iron-manganese concretions; very strongly acid; clear smooth boundary.

Bssg2—13 to 27 inches; gray (10YR 6/1) clay; strong medium subangular blocky structure; firm; common fine pores; few fine roots; few slickensides that do not intersect; common medium distinct strong brown (7.5YR 5/6) iron concentrations; common fine cemented iron-manganese concretions; very strongly acid; clear wavy boundary.

Bssg3—27 to 36 inches; gray (10YR 6/1) clay; strong medium subangular blocky structure; firm; few fine pores; common slickensides; common medium distinct strong brown (10YR 4/6) and common medium prominent yellowish red (5YR 5/6) iron concentrations; common fine cemented dark iron-manganese concretions; strongly acid; clear smooth boundary.

2Bkss—36 to 60 inches; reddish brown (5YR 4/4) clay; moderate medium subangular blocky structure; firm; few fine pores; common intersecting slickensides; few medium light grayish brown cemented calcium carbonate concretions; common fine cemented dark iron-manganese concretions; few dark organic stains; moderately alkaline; clear smooth boundary.

2Ckss—60 to 80 inches; reddish brown (5YR 4/4) clay; structureless, massive; firm; few fine pores; common intersecting slickensides; common medium cemented calcium carbonate concretions; moderately alkaline.

Range in Characteristics

Solum thickness: More than 40 inches

A or Ap horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 1 or 2
Texture—clay
Redoximorphic concentrations and depletions—none
Reaction—strongly acid to slightly acid

Bssg horizon:
Color—hue of 10YR, value of 4 to 6, and chroma of 1
Texture—clay
Redoximorphic concentrations and depletions—shades of brown and red
Reaction—very strongly acid to slightly acid

2B horizon:
Color—hue of 5YR, value of 3 or 4, and chroma of 4
Texture—clay
Redoximorphic concentrations and depletions—shades of gray and brown
Reaction—neutral to moderately alkaline

2Ck or 2Ckss horizon:
Color—hue of 5YR, value of 4 or 5, and chroma of 3 or 4
Texture—clay
Redoximorphic concentrations and depletions—none
Reaction—neutral to moderately alkaline

Portland Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Very slow
Landscape: Arkansas River valley
Landform: Backswamp
Parent material: Clayey alluvium
Commonly associated soils: Desha, Hebert, Keo, Perry, Rilla, and Yorktown
Slope range: 0 to 1 percent
Taxonomic class: Very-fine, mixed, superactive, nonacid, thermic Vertic Epiaquepts

Typical Pedon

Portland clay, 0 to 1 percent slopes, in a cultivated field in the SE1/4NE1/4SW1/4 sec. 21, T. 3 S., R. 6 W.

Ap—0 to 4 inches; dark brown (10YR 4/2) clay; strong fine granular structure; friable; many fine roots; common very fine and fine pores; common fine dark cemented iron-manganese concretions; slightly acid; abrupt smooth boundary.
Bw1—4 to 17 inches; brown (7.5YR 5/4) clay; moderate medium subangular blocky structure; firm; common very fine and fine pores; few fine roots; common fine distinct light brownish gray (10YR 6/2) iron depletions; common fine dark weakly cemented iron-manganese concretions with diffuse boundaries; very strongly acid; gradual wavy boundary.
Bw2—17 to 23 inches; brown (7.5YR 5/4) clay; moderate medium subangular blocky structure; firm; common fine pores; common medium distinct light brownish gray (10YR 6/2) iron depletions; common fine dark cemented iron-manganese concretions; slightly acid; gradual wavy boundary.
Bw3—23 to 30 inches; reddish brown (5YR 4/4) clay; moderate medium subangular blocky structure; firm; common fine pores; common medium distinct light brownish gray (10YR 6/2) iron depletions; common fine dark cemented iron-manganese concretions; slightly acid; clear wavy boundary.
Bw4—30 to 50 inches; reddish brown (5YR 4/3) clay; strong medium subangular blocky structure; firm; common fine pores; few medium cemented calcium carbonate concretions; moderately alkaline; calcareous; clear wavy boundary.
C—50 to 80 inches; reddish brown (5YR 4/4) silty clay; massive; firm; common fine pores; few fine cemented carbonate concretions; few fine dark manganese concentrations; moderately alkaline; calcareous.

Range in Characteristics

Solum thickness: More than 40 inches

A or Ap horizon:
Color—hue of 7.5YR, value of 3 or 4, and chroma of 2 to 4; or hue of 10YR, value of 3 to 5, and chroma of 2 or 3
Texture—clay
Redoximorphic concentrations and depletions—shades of brown or black
Reaction—very strongly acid to slightly acid

Bw horizon (upper part):
Color—hue of 5YR, value of 4, and chroma of 3 or 4; or hue of 7.5YR, value of 4 or 5, and chroma of 4
Texture—clay
Redoximorphic concentrations and depletions—shades of gray or brown
Reaction—very strongly acid to slightly acid

Bw horizon (lower part):
Color—hue of 5YR, value of 4, and chroma of 3 or 4; or hue of 7.5YR, value of 4 or 5, and chroma of 4
Texture—silty clay or clay
Redoximorphic concentrations and depletions—shades of gray or brown
Reaction—slightly acid to moderately alkaline

C horizon:
Color—hue of 5YR, value of 4, and chroma of 3 or 4; or hue of 7.5YR, value of 4 or 5, and chroma of 4
Texture—silt loam to clay
Redoximorphic concentrations and depletions—none
Reaction—slightly acid to moderately alkaline

Rilla Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landscape: Arkansas River valley

Landform: Natural levee
Parent material: Loamy alluvium
Commonly associated soils: Hebert, Perry, and Portland
Slope range: 0 to 3 percent
Taxonomic class: Fine-silty, mixed, active, thermic Typic Hapludalfs

Typical Pedon

Rilla silt loam, 0 to 1 percent slopes, in a cultivated field in the NW1/4NW1/4NE1/4 sec. 9, T. 4 S., R. 6 W.

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

Bt1—5 to 11 inches; yellowish red (5YR 5/6) silty clay loam; moderate medium subangular blocky structure; firm; common fine and medium pores; common fine roots; common distinct clay films on faces of peds; few fine pale brown (10YR 6/3) clay depletions on faces of peds; strongly acid; gradual smooth boundary.

Bt2—11 to 25 inches; reddish brown (5YR 4/4) silty clay loam; moderate medium subangular blocky structure; firm; common fine pores; few fine roots; many distinct clay films on faces of peds; few fine pale brown (10YR 6/3) clay depletions on faces of peds; common fine black (10YR 2/1) manganese concentrations on faces of some peds; very strongly acid; gradual smooth boundary.

Bt3—25 to 35 inches; reddish brown (5YR 4/4) silty clay loam; moderate medium subangular blocky structure; firm; common fine pores; many distinct clay films on faces of peds; common fine black (10YR 2/1) manganese concentrations on faces of some peds; very strongly acid; gradual smooth boundary.

BC—35 to 55 inches; reddish brown (5YR 4/4) loam; weak medium subangular blocky structure; friable; common fine pores; few medium pale brown (10YR 6/3) clay depletions; few fine black (10YR 2/1) manganese concentrations on faces of some peds; strongly acid; gradual smooth boundary.

C—55 to 72 inches; light reddish brown (5YR 6/3) loam; structureless, massive; firm; common fine pores; few medium light brownish gray (10YR 6/3) clay depletions; few dark cemented iron-manganese concretions; strongly acid.

Range in Characteristics

Solum thickness: 40 to 60 inches

A or Ap horizon:
Color—hue of 7.5YR, value of 4 or 5, and chroma of 2; or hue of 10YR, value of 4 or 5, and chroma of 2 or 3
Texture—silt loam
Redoximorphic concentrations and depletions—none
Reaction—strongly acid to slightly acid

Bt horizon:
Color—hue of 5YR, value of 4 or 5, and chroma of 3, 4, or 6; or hue of 7.5YR, value of 5, and chroma of 4 or 6
Texture—silt loam, loam, or silty clay loam
Redoximorphic concentrations and depletions—shades of brown
Reaction—very strongly acid or strongly acid

BC horizon:
Color—hue of 5YR, value of 4 or 5, and chroma of 4 or 6
Texture—silt loam, loam, or silty clay loam
Redoximorphic concentrations and depletions—none
Reaction—strongly acid or moderately acid

C horizon:
Color—hue of 5YR or 7.5YR, value of 4 to 6, and chroma of 3, 4, or 6
Texture—loam or silty clay loam
Redoximorphic concentrations and depletions—shades of gray
Reaction—very strongly acid to neutral

Stuttgart Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Slow
Landscape: Grand Prairie upland
Landform: Stream terrace
Parent material: Silty and clayey alluvium
Commonly associated soils: Dewitt, Immanuel, Lagrue, Muskogee, and Tichnor
Slope range: 0 to 3 percent
Taxonomic class: Fine, smectitic, thermic Albaquultic Hapludalfs

Typical Pedon

Stuttgart silt loam, 0 to 1 percent slopes, in a cultivated field in the SW1/4NE1/4SE1/4 sec. 8, T. 4 S., R. 3 W.

Ap1—0 to 4 inches; brown (10YR 5/3) silt loam; moderate medium and coarse granular structure parting to coarse subangular blocky; friable; few fine coarse and very coarse pores; common fine roots; many fine faint dark brown (10YR 4/3) and common medium distinct strong brown (7.5YR 4/6) iron concentrations; few brown to black soft iron-manganese masses; moderately acid; abrupt smooth boundary.

Ap2—4 to 9 inches; dark brown (10YR 4/3) silt loam; weak coarse subangular blocky structure; friable; common fine and few medium and coarse pores; common fine roots; few fine faint yellowish brown (10YR 5/4) and dark yellowish brown (10YR 3/4) iron concentrations mainly around roots and pores; strongly acid; clear smooth boundary.

E—9 to 15 inches; yellowish brown (10YR 5/4) silt loam; weak medium and coarse subangular blocky structure; friable; many fine, common medium, and few coarse pores; common fine roots; common light gray (10YR 7/1) clay depletions lining some pores; few faint clay films on faces of peds; common fine faint pale brown (10YR 6/3) iron depletions; common medium prominent red (2.5YR 4/6) and few fine prominent yellowish red (5YR 4/6) iron concentrations dominantly in bottom of horizon; few fine soft black iron-manganese masses; strongly acid; clear smooth boundary.

Bt1—15 to 21 inches; 50 percent reddish brown (2.5YR 4/4), 40 percent grayish brown (10YR 5/2), and 10 percent reddish brown (5YR 5/4) silty clay; moderate medium subangular blocky structure parting to strong fine angular blocky; firm; common fine pores; few fine roots; many distinct clay films on faces of peds and lining pores; many light gray (10YR 7/1) clay depletions in upper 1 inch of horizon; strongly acid; clear smooth boundary.

Bt2—21 to 27 inches; dark brown (7.5YR 4/4) silty clay loam; moderate medium and coarse subangular blocky structure; firm; common fine pores; common fine roots; common distinct grayish brown (10YR 5/2) and strong brown (7.5YR 5/8) clay films on faces of peds and lining most pores; few medium gray (10YR 6/1) clay depletions on faces of peds; common medium distinct grayish brown (10YR 5/2) and yellowish brown (10YR 5/4) iron depletions; few fine round soft strong brown (7.5YR 5/8) iron masses; strongly acid; clear smooth boundary.

Btg1—27 to 35 inches; light brownish gray (10YR 6/2) silt loam; moderate medium and coarse subangular blocky structure; firm; common fine pores; few fine roots; few dark brown (10YR 3/3) clay pocket in matrix; common light gray (10YR 7/1) clay depletions on faces of peds; most pores lined with grayish brown (10YR 5/2) clay films; common distinct (10YR 5/2) clay films on faces of peds; common coarse faint grayish brown (10YR 5/2) iron depletions; common fine distinct strong brown (7.5YR 5/8), few fine distinct strong brown (7.5YR 4/6), and few medium faint yellowish brown (10YR 5/4) iron concentrations; few round strong brown (7.5YR 4/6) iron mass; moderately acid; gradual smooth boundary.

Btg2—35 to 50 inches; light brownish gray (10YR 6/2) silt loam; weak coarse subangular blocky structure; firm; common fine, medium, and coarse and few very coarse pores; few fine roots; few grayish brown (10YR 5/2) clay films lining some pores and on faces of peds; many light gray (10YR 7/1) clay depletions on most faces of peds and lining some pores; common medium distinct yellowish brown (10YR 5/6), few medium distinct strong brown (7.5YR 4/6), and few medium strong brown (7.5YR 5/8) iron concentrations; few coarse faint grayish brown (10YR 5/2) iron depletions; few fine black concretions: few pores with black (10YR 2/1) manganese halos; few fine black manganese concentrations on faces of peds; two old crayfish burrows filled with light gray (10YR 7/1) silt, one with a dark brown (10YR 3/3) clay cap; moderately acid; gradual smooth boundary.

BCtg—50 to 80 inches; light brownish gray (10YR 6/2) silt loam; weak very coarse subangular blocky structure; extremely firm; common fine and few medium pores; few fine roots; some pores lined with grayish brown (10YR 5/2) clay films; common coarse distinct light yellowish brown (10YR 6/4) iron concentrations dominantly in matrix; few medium strong brown (7.5YR 4/6) iron concentrations dominantly around pores; few pores lined with black (10YR 2/1) manganese concentrations; few fine black manganese concentrations in matrix; few medium strong brown (7.5YR 5/8) iron concentrations; moderately acid.

Range in Characteristics

Solum thickness: More than 60 inches

A or Ap horizon:

Color—hue of 10YR, value of 4 or 5, and chroma of 2 to 4

Texture—silt loam

Redoximorphic concentrations and depletions—shades of brown

Reaction—strongly acid or moderately acid

E horizon:

Color—hue of 10YR, value of 5 or 6, and chroma of 3 or 4

Texture—silt loam
Redoximorphic concentrations and depletions—shades of brown, red, or gray
Reaction—strongly acid or moderately acid

Bt horizon:
Color—hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 4, 6, or 8; in some pedons, there is no dominant hue, and the horizon is variegated in shades of red, brown, and gray
Texture—silty clay loam or silty clay
Redoximorphic concentrations and depletions—shades of gray or brown
Reaction—very strongly acid to moderately acid

Btg horizon:
Color—hue of 10YR, value of 5 or 6, and chroma of 1 or 2
Texture—silt loam or silty clay loam
Redoximorphic concentrations and depletions—shades of red, yellow, brown, or gray
Reaction—moderately acid to slightly alkaline

BCg or BCtg horizon:
Color—hue of 10YR, value of 5 or 6, and chroma of 1 or 2
Texture—silt loam or silty clay loam
Redoximorphic concentrations and depletions—shades of red, yellow, brown, or gray
Reaction—moderately acid to slightly alkaline

Tichnor Series

Depth class: Very deep
Drainage class: Poorly drained or very poorly drained
Permeability: Moderately slow
Landscape: Grand Prairie upland
Landform: Flood plain
Parent material: Loamy alluvium
Commonly associated soils: Dewitt, Ethel, Immanuel, Lagrue, Muskogee, Oaklimeter, and Stuttgart
Slope range: 0 to 1 percent
Taxonomic class: Fine-silty, mixed, active, thermic Typic Endoaqualfs

Typical Pedon

Tichnor silt loam, 0 to 1 percent slopes, frequently flooded, in the NE1/4NW1/4SW1/4 sec. 28, T. 4 S., R. 3 W.

Ap—0 to 7 inches; dark brown (10YR 4/3) silt loam; weak coarse subangular blocky structure; friable; many fine and few medium pores; common fine roots; few fine distinct strong brown (7.5YR 5/6) iron concentrations, mainly around root channels; few fine and medium iron-manganese concretions with weakly cemented brown exteriors and strongly cemented hard black interiors throughout; moderately acid; abrupt smooth boundary.

Eg1—7 to 19 inches; light brownish gray (10YR 6/2) silt loam; weak coarse subangular blocky structure; very friable; few fine roots; common fine and medium pores; many medium distinct strong brown (7.5YR 5/6) and few medium yellowish brown (10YR 5/8) iron concentrations throughout matrix; some pores lined with strong brown (7.5YR 5/6) and a few pores lined with yellowish red (5YR 5/6) iron concentrations; few fine and medium iron-manganese concretions with weakly cemented brown exterior and strongly cemented hard black interior; strongly acid; clear smooth boundary.

Eg2—19 to 31 inches; light gray (10YR 7/1) silt loam; weak coarse subangular blocky structure; very friable; occasional fine root; few fine and medium pores; few medium distinct pale brown (10YR 6/3) and few fine distinct brownish yellow (10YR 6/6) iron concentrations throughout matrix; few fine and medium iron-manganese concretions with weakly cemented brown exteriors and strongly cemented hard black interiors; strongly acid; gradual smooth boundary.

Btg1—31 to 47 inches; light brownish gray (10YR 6/2) silty clay loam; weak coarse subangular blocky structure; friable; few fine and medium pores; many distinct grayish brown (10YR 5/2) clay films on faces of peds and lining most pores; few medium faint light brownish gray (2.5Y 6/2) iron depletions; few fine and medium distinct strong brown (7.5YR 5/6) and few medium distinct brownish yellow (10YR 6/6) iron concentrations throughout matrix; few fine, medium, and coarse and occasional very coarse iron-manganese concretions with weakly cemented brown exteriors and strongly cemented hard interiors; one crayfish burrow about 2 inches in diameter filled with light brownish gray (10YR 6/2) silt through part of horizon; strongly acid; gradual smooth boundary.

Btg2—47 to 65 inches; light brownish gray (10YR 6/2) silty clay loam; moderate medium and coarse subangular blocky structure; friable; few fine and medium pores; many prominent grayish brown (10YR 5/2) clay films on faces of peds and lining most pores; numerous crayfish burrows 1 to 3 inches in diameter lined with grayish brown (10YR 5/2) silty clay loam about 1/2 inch thick that is hard and brittle; burrows filled with light brownish gray (10YR 6/2) silt; few coarse distinct yellowish brown (10YR 5/4) iron concentrations throughout matrix; few medium faint brownish yellow (10YR 6/6) iron concentrations around crayfish burrows; few medium distinct strong brown (7.5YR 5/8) iron concentrations around crayfish burrows that are slightly hard and brittle; few fine, medium, coarse, and very coarse iron-manganese concretions with thin weakly cemented brown exteriors and strongly cemented hard black interiors; few fine powdery white barite concentrations on faces of a few peds; strongly acid; gradual smooth boundary.

Btg3—65 to 80 inches; light brownish gray (10YR 6/2) silt loam; moderate medium and coarse subangular blocky structure; firm, some peds brittle; common fine and medium pores; many light brownish gray (10YR 6/2) clay films on faces of peds and lining most pores; common coarse distinct yellowish brown (10YR 5/4) and few medium distinct dark yellowish brown (10YR 3/4) iron concentrations; few fine, medium, and coarse weakly cemented black manganese concretions; strongly acid.

Range in Characteristics

Solum thickness: More than 60 inches

Ap horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 2 or 3
Texture—silt loam
Redoximorphic concentrations and depletions—shades of brown
Reaction—extremely acid to moderately acid

Eg horizon:
Color—hue of 10YR, value of 5 to 7, and chroma of 1 or 2
Texture—silt loam
Redoximorphic concentrations and depletions—shades of brown, gray, red, or yellow
Reaction—extremely acid to moderately acid

Btg horizon:
Color—hue of 10YR, value of 5 or 6, and chroma of 1 or 2
Texture—silt loam or silty clay loam
Redoximorphic concentrations and depletions—shades of yellow, brown, or gray
Reaction—extremely acid to moderately acid

BC or C horizon (where present):
Color—hue of 10YR, value of 5 to 7, and chroma of 1 or 2
Texture—silt loam or silty clay loam
Redoximorphic concentrations and depletions—shades of yellow, brown, or gray
Reaction—extremely acid to moderately acid

Yancopin Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Landscape: White River valley
Landform: Flood plain
Parent material: Silty alluvium
Commonly associated soils: Kobel
Slope range: 0 to 3 percent
Taxonomic class: Fine-silty, mixed, superactive, nonacid, thermic Typic Endoaquepts

Typical Pedon

Yancopin silty clay loam, 1 to 3 percent slopes, frequently flooded, in a wooded area in the SW1/4SE1/4NE1/4 sec. 10, T. 4 S., R. 1 W.

A—0 to 3 inches; grayish brown (10YR 5/2) silty clay loam; weak fine subangular blocky structure; friable; common fine and medium pores; common fine and medium roots; few fine dark brown weakly cemented iron-manganese concretions with diffuse boundary; moderately acid; clear wavy boundary.

Bg1—3 to 12 inches; grayish brown (10YR 5/2) silty clay loam; moderate medium subangular blocky structure; firm; common very fine and fine pores; common fine roots; common medium distinct yellowish brown (10YR 5/6) iron concentrations within peds; common fine weakly cemented iron-manganese concretions with diffuse boundaries; common worm casts; slightly acid; clear smooth boundary.

Bg2—12 to 26 inches; grayish brown (10YR 5/2) silty clay loam; moderate medium subangular blocky structure; firm; common fine pores; common fine roots; common medium distinct brown (7.5YR 5/4) and prominent strong brown (5YR 5/6) iron concentrations within peds; common fine weakly cemented iron-manganese concretions with diffuse boundaries; slightly acid; clear wavy boundary.

Bg3—26 to 36 inches; dark grayish brown (10YR 4/2) silty clay loam; moderate medium subangular blocky structure; firm; common fine pores; few fine roots; common medium distinct strong brown (7.5YR 5/6) iron concentrations within peds; common fine and medium iron-manganese concretions with diffuse boundary; slightly acid; clear wavy boundary.

BCg—36 to 55 inches; dark grayish brown (10YR 4/2) silt loam; weak fine subangular blocky structure; friable; common fine pores; few fine roots;

common medium distinct yellowish brown (10YR 5/4 and 5/6) iron concentrations within peds; common fine and medium weakly cemented iron-manganese concretions with diffuse boundary; moderately acid; gradual smooth boundary.

Cg—55 to 72 inches; grayish brown (10YR 5/2) sandy loam; structureless, massive; friable; common fine pores; common medium distinct dark yellowish brown (10YR 4/4) iron concentrations; common fine and medium cemented iron-manganese concretions; slightly acid.

Range in Characteristics

Solum thickness: More than 50 inches

A horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 2 or 3
Texture—silty clay loam
Redoximorphic concentrations and depletions—none
Reaction—moderately acid to neutral

Bg horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 2
Texture—silt loam or silty clay loam
Redoximorphic concentrations and depletions—shades of brown and gray
Reaction—slightly acid or neutral

BCg horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 1 or 2
Texture—silt loam or silty clay loam
Redoximorphic concentrations and depletions—shades of brown and gray
Reaction—moderately acid to neutral

Cg horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 1 or 2
Texture—sandy loam, fine sandy loam, silt loam, loam, or silty clay loam
Redoximorphic concentrations and depletions—shades of brown and gray
Reaction—slightly acid to slightly alkaline

Yorktown Series

Depth class: Very deep
Drainage class: Very poorly drained
Permeability: Very slow
Landscape: Arkansas River valley
Landform: Oxbow
Parent material: Clayey alluvium
Commonly associated soils: Perry and Portland
Slope range: 0 to 1 percent
Taxonomic class: Very-fine, smectitic, nonacid, thermic Vertic Epiaquepts

Typical Pedon

Yorktown silty clay, ponded, 0 to 1 percent slopes, frequently flooded, in a wooded abandoned oxbow area in the SW1/4NE1/4NW1/4 sec. 19, T. 8 S. R. 1 W.

A—0 to 7 inches; gray (10YR 6/1) silty clay; weak coarse subangular blocky structure; very firm, sticky; common very fine and fine pores; common fine roots; common medium faint gray (10YR 5/1) iron depletions; moderately acid; clear smooth boundary.

Bg1—7 to 22 inches; gray (5Y 6/1) clay; moderate medium subangular blocky structure; very firm, sticky, plastic; common very fine and fine pores; common fine and medium roots; common medium distinct strong brown (7.5YR 5/6) and yellowish brown (10YR 5/6) iron concentrations; common fine dark cemented iron-manganese concretions; neutral; clear wavy boundary.

Bg2—22 to 42 inches; gray (5Y 5/1) clay; moderate coarse subangular blocky structure; very firm, sticky, plastic; common fine pores; common fine roots; common medium distinct strong brown (7.5YR 5/6) iron concentrations; common fine dark cemented iron-manganese concretions; neutral; clear smooth boundary.

Bg3—42 to 60 inches; greenish gray (5BG 5/1) clay; moderate medium subangular blocky structure; firm, sticky, plastic; common fine pores; common prominent yellowish red (5YR 5/6) iron concentrations; many fine dark cemented iron-manganese concretions; common medium dark manganese concentrations on faces of peds; neutral; abrupt smooth boundary.

2BC—60 to 72 inches; reddish brown (5YR 4/3) clay; weak medium subangular blocky structure; very firm, sticky, plastic; common fine pores; common shiny pressure faces; common medium distinct gray (10YR 5/1 and 6/1) iron depletions; common fine dark cemented iron-manganese concretions; few medium dark manganese concentrations; slightly alkaline.

Range in Characteristics

Solum thickness: 50 to 80 inches

A horizon:
Color—hue of 10YR, value of 4 to 6, and chroma of 1; or hue of 5Y, value of 4 or 5, and chroma of 1

Texture—silty clay
Redoximorphic concentrations and depletions—shades of gray
Reaction—moderately acid to neutral

Bg horizon:
Color—hue of 10YR, value of 4 to 6, and chroma of 1; or hue of 5Y or 5BG, value of 5 or 6, and chroma of 1
Texture—clay
Redoximorphic concentrations and depletions—shades of red or brown
Reaction—moderately acid to neutral

2BC horizon:
Color—hue of 5YR, value of 4 or 5, and chroma of 3 or 4
Texture—clay
Redoximorphic concentrations and depletions—shades of gray
Reaction—slightly alkaline or moderately alkaline

Table 19.--Classification of the Soils

Soil name	Family or higher taxonomic class
Crevasse	Mixed, thermic Typic Udipsamments
Desha	Very-fine, smectitic, thermic Vertic Hapludolls
Dewitt	Fine, smectitic, thermic Typic Albaqualfs
Dubbs	Fine-silty, mixed, active, thermic Typic Hapludalfs
Dundee	Fine-silty, mixed, active, thermic Typic Endoaqualfs
Ethel	Fine-silty, mixed, active, thermic Typic Glossaqualfs
Forestdale	Fine, smectitic, thermic Typic Endoaqualfs
Hebert	Fine-silty, mixed, active, thermic Aeric Epiaqualfs
Immanuel	Fine-silty, mixed, active, thermic Fragic Oxyaquic Hapludalfs
Keo	Coarse-silty, mixed, active, thermic Dystric Fluventic Eutrudepts
Kobel	Fine, smectitic, nonacid, thermic Vertic Endoaquepts
Lagrue	Fine, smectitic, thermic Typic Epiaqualfs
Muskogee	Fine-silty, mixed, active, thermic Aquic Paleudalfs
Oaklimeter	Coarse-silty, mixed, active, thermic Fluvaquentic Dystrudepts
Overcup	Fine, smectitic, thermic Vertic Albaqualfs
Perry	Very-fine, smectitic, thermic Chromic Epiaquerts
Portland	Very-fine, mixed, superactive, nonacid, thermic Vertic Epiaquepts
Rilla	Fine-silty, mixed, active, thermic Typic Hapludalfs
Stuttgart	Fine, smectitic, thermic Albaquultic Hapludalfs
Tichnor	Fine-silty, mixed, active, thermic Typic Endoaqualfs
Udipsamments	Mixed, thermic Typic Udipsamments
Yancopin	Fine-silty, mixed, superactive, nonacid, thermic Typic Endoaquepts
Yorktown	Very-fine, smectitic, nonacid, thermic Vertic Epiaquepts

Formation of the Soils

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

Factors of Soil Formation

Soil is formed by weathering and other soil-forming processes that act upon the material deposited or accumulated by geologic age. The characteristics of the soil at any given point depend upon climate, living organisms, parent material, relief, and time. Each factor acts on the soil and modifies the effect of the other four. When climate, living organisms, or any of the other five factors is varied to a significant extent, a different soil may be formed.

Climate and living organisms are the active forces in soil formation. They act on parent material, slowly changing it into soil. Relief modifies the effects of climate and living organisms, mainly by its influence on temperature and runoff. Because climate, vegetation, parent material, and relief interact over a period of time, the effect of time is also reflected in the soil characteristics. The interaction of the five factors of soil formation is more complex for some soils than for others. The five factors and how they interact to form some of the soils in Arkansas County are discussed in the following paragraphs.

Climate

The climate of Arkansas County is characterized by mild winters, warm or hot summers, and general abundant rainfall. The general warm temperatures and high precipitation probably are similar to the climate under which the soils in the county formed. The average temperature in July is about 90 degrees F and about 41 degrees F in January. The total annual rainfall is about 44 inches and is well distributed throughout the year. For additional information about climate, refer to the section “General Nature of the County.”

The warm, moist climate promotes rapid soil formation and encourages rapid chemical reactions. The large amount of water that moves through the soil is instrumental in moving dissolved or suspended material downward in the soil profile. Plant remains decompose rapidly, and the organic acid that forms hastens the removal of carbonates and the formation of clay minerals.

Living Organisms

Plants and animals, including insects, bacteria, and fungi, are important in the formation of soils. Among the changes they cause are additions of organic matter and nitrogen in the soil, additions or losses in plant nutrients, and changes in soil structure and porosity.

Before Arkansas County was settled, the native vegetation had more influence on soil formation than did animal activity.

Hardwood forests covered most of the bottomland of the county. On the flood plain and natural levees, the trees were mainly oaks, sweetgum, ash, sycamore, hackberry, pecan, and hickory. Hebert, Keo, Kobel, Perry, Portland, Rilla, and Yancopin soils formed in these areas. In slackwater areas or swamps, the main trees were baldcypress and water tupelo. Kobel and Yorktown ponded soils formed in these areas.

On the eastern side of the upland, the forests were mainly mixed stands of hardwoods. Soils such as Ethel and Immanuel formed in these areas.

In the central part of Arkansas County the native vegetation is believed to have been of a prairie or savannah type. The Dewitt and Stuttgart soils formed in this area.

In most cases, the soil characteristics were influenced more by parent material, climate, and relief than by vegetation.

People are important to the future rate and direction of soil formation. They clear the forests, cultivate the soils, and introduce new kinds of plants. Fertilizers, lime, and chemicals for insect, disease, and weed control are added to the soil. Constructing levees and dams for flood control, improving drainage, and grading the soil surface also affect the development of soils. Some results of these changes will not be evident for many centuries; nevertheless, the effects of living organisms on soil formation in Arkansas County has been drastically changed by these activities. Thus, man has become the most important organism affecting soil formation.

Parent Material and Geology

The soils of Arkansas County formed in water deposited alluvium of different ages. The recent or Holocene age alluvium was deposited by the Arkansas and White Rivers and smaller tributaries. The alluvium consists of a mixture of minerals washed from many kinds of soils, rocks, and unconsolidated sediments derived from the Mississippi River basin, which extends from Montana to Pennsylvania.

The wide range in texture of alluvium in the county results from differences in the site of deposition. When a river overflows and spreads over its flood plain, the coarse sediments are deposited in bands roughly parallel to the channel. Thus, low ridges known as natural levees are formed. On these ridges, Keo, Rilla, and Yancopin soils formed. Finer sediments, high in silt content, are deposited as the floodwaters spread and lose velocity. These sediments contain some sand and clay. Dundee and Forestdale soils formed in these sediments of intermediate texture. When the flood recedes and water is left standing as shallow lakes or swamps, the clay and finer silt settle. In these sediments, Kobel and Overcup soils formed.

The soils on the east side of Arkansas County formed in silty material that was deposited during the Pleistocene Epoch. This material may have initially been deposited as loess, but has been reworked by water. On the level parts of the plain, Ethel soils formed. In the nearly level to gently sloping areas, Immanuel soils formed.

Relief

Relief is the inequalities in elevation of a land surface. The other soil-forming factors are affected by relief through its effect on drainage, runoff, erosion, and percolation of water through the soil. Some of the greatest differences among the soils are due mainly to differences in relief.

In Arkansas County, the alluvial terraces above the flood plains of streams have relief ranging from broad flats and depressions to areas of alternating swales and low ridges. Local differences in elevation range to as much as 20 feet on a few steep escarpments, but are generally 5 to 10 feet in most areas. The slope is generally less than 3 percent. On the broad flats and in depressions on flats and between low ridges, a difference in local elevation is small. Surface drainage is slow or very slow. Soils in these areas are poorly drained or somewhat poorly drained and have a seasonal perched water table. Dundee, Forestdale, and Overcup soils formed in these areas. The well drained Dubbs soils are on low ridges at a slightly higher elevation.

The uplands in Arkansas County have relief ranging from broad flats to moderately steep ridges. Local differences in relief are usually less than 1 foot on flats and range up to 3 to 8 feet on ridges. On the broad flats, surface drainage is slow or very slow. Soils in these areas are poorly drained and have a seasonal high water table. Ethel soils formed in these areas. On ridges, the moderately well drained Immanuel soils formed.

The flood plain area of Arkansas County consists of the LaGrue Bayou, Bayou Meto, Arkansas River, and White River bottomland. These areas have relief ranging from broad flats to undulating areas of alternating swales and low ridges. Local differences in relief are usually less than 1 foot on the flats and range up to 3 feet in the areas of swales and low ridges. On the broad flats, surface drainage is slow or very slow. Soils in these areas are poorly drained and have a seasonal high water table. In the Bayou LaGrue bottomland area, Tichnor soils formed, and in the White River bottomland, Kobel soils formed. The somewhat poorly drained Yancopin soils formed in gently undulating areas of the White River bottomland. Perry and Portland soils formed in the Arkansas River and Bayou Meto bottomland area.

The elevation ranges from 140 to 160 feet in the White River flood plain, 150 to 185 feet in the Arkansas River and Bayou Meto bottomland area, and 170 to 220 feet in the Grand Prairie.

Time

The length of time required for formation of a soil depends largely on other factors of soil formation. Less time generally is required if the climate is warm and humid and the vegetation luxuriant than if climate is cold and vegetation is sparse. When other factors are equal, less time is required if the parent material is loamy than if it is clayey.

In terms of geological time, all of the soils of Arkansas County are young. In terms of soil formation, their age varies widely. Older soils usually show a greater contrast between horizons than do younger soils.

All of the soils in Arkansas County, except the Crevasse soil, have a developed B horizon. The Crevasse soils are on natural levees along flood plains of the Arkansas River. These soils are young and exhibit few profile characteristics that show the effect of time. Other soils, such as Oaklimeter and Yancopin, have not been in place long enough to form an argillic, or mature B horizon, but have formed a cambic, or less well developed, B horizon. The Kobel soils formed in slackwater deposits of clay that shrink and swell. Because of the high clay content and because of mixing caused by shrinking and swelling, an argillic horizon has not formed. Many soils, such as Dewitt, Ethel, Dundee, Dubbs and Forestdale, have been forming long enough and in stable enough material to have an argillic horizon. Other soils, such as Immanuel, also have a fragipan.

Processes of Soil Formation

The effects of the soil-forming factors are reflected in the soil profile. The soil profile is a succession of layers, or horizons, from the surface to the parent material. These horizons differ in one or more properties, such as color, texture, structure, consistency, porosity, or reaction.

Most soil profiles in this survey area contain 4 to 8 horizons or layers. The master horizons are designated A, E, B, and C. Young soils do not have E and B horizons.

The horizon of maximum accumulation of organic matter is called the A horizon, or the surface layer. An Ap horizon is a plowed surface layer. The horizon of maximum leaching of dissolved or suspended material is called the E horizon, or the subsurface layer.

The B horizon, or subsoil, is below the A or E horizon. It is the horizon of maximum accumulation of suspended material, such as clay and iron. Commonly, the B horizon has blocky structure and is firmer than the horizons immediately above or below it.

The C horizon is below the B horizon. It is affected little by the soil-forming processes, but it can be materially modified by weathering. In some young soils, the C horizon immediately underlies the A horizon and has been slightly modified by living organisms as well as weathering.

In this survey area, several processes have been active in the formation of soil horizons. These processes are the accumulation of organic matter, the leaching of carbonates and bases, the oxidation or reduction and transfer of iron, and the formation and translocation of silicate clay minerals. In most of the soils, more than one of these processes has been active in soil formation.

The accumulation of organic matter in the upper part of the profile (A horizon) has been an important process of soil formation. The soils in Arkansas County range from high to low in organic matter content.

Leaching of carbonates and bases has occurred to some degree in nearly all of the soils in the survey area. Generally, bases are leached downward in soils before silicate clay minerals begin to move. Most of the soils on the uplands in the survey area have been strongly leached. Some soils, such as Kobel and Yancopin, are only slightly leached.

Oxidation of iron is evident in the moderately well drained and well drained soils in the county. Oxidation of iron is indicated by the yellowish brown, brown, and strong brown colors in the B horizon of the Immanuel, Portland, Rilla, and Stuttgart soils.

The reduction and transfer of iron has occurred to a significant degree in the poorly drained and somewhat poorly drained soils in the lowlands. In the naturally wet soils, this process is called gleying. The gray colors in the horizon below the surface layer indicate the reduction and loss of iron. Some horizons contain reddish or yellowish accumulations and concretions derived from segregated iron. Gleying is very pronounced in the Dewitt, Ethel, and Tichnor soils.

The translocation of silicate clay minerals has contributed to horizon development in most of the soils in the county. Where the E horizon occurs, it generally has weak subangular blocky structure, has less clay than the lower horizons, and is lighter in color than the rest of the soil. Clay films generally have accumulated in pores and on the surface of peds in the B horizon. The soils were probably leached of carbonates and soluble salts to a great extent before translocation of silicate clay occurred.

Leaching of bases and translocation of silicate clay are among the most important processes in horizon differentiation in the soils of Arkansas County.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

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

Alpha,alpha-dipyridyl. A dye that when dissolved in 1N ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.

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.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

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 geomorphic component that forms the steepest inclined surface and principal element of many hillsides. Backslopes in profile are commonly steep, are linear, and may or may not include cliff segments.

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.

Bedding planes. Fine strata, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediment.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bottomland. The normal flood plain of a stream, subject to flooding.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

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. Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.

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.

Clayey soil. Silty clay, sandy clay, or clay.

Coarse fragments. Mineral or rock particles larger than 2 millimeters in diameter.

Coarse textured soil. Sand or loamy sand.

Colluvium. Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

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.”

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosion. Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cropping system. Growing crops according to a planned system of rotation and management practices.

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.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deep soil. A soil that is 40 to 60 inches deep over bedrock or to other material that restricts the penetration of plant roots.

Deep to water (in tables). Deep to permanent water during the dry season.

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.

Depth to bedrock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of 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. An area of ground at a lower elevation than the surrounding ground and in which water collects and is drained to a closed depression or lake or to a drainageway at a lower elevation. A drainageway may or may not have distinctly incised channels at its upper reaches or throughout its course.

Droughty (in tables). Soil holds too little water for plants during dry periods.

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 soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

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.

Erodes easily (in tables). Soil is easily eroded by water.

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.

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. Synonym: scarp.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Excess sodium (in tables). Excess exchangeable sodium in the soil. The resulting poor physical properties restrict the growth of plants.

Fast intake (in tables). The rapid movement of water into the soil.

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

Fine textured soil. Sandy clay, silty clay, or clay.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flooding (in tables). Soil flooded by moving water from stream overflow or runoff.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fluvial. Of or pertaining to rivers; produced by river action, as a fluvial plain.

Fragile (in tables). A soil that is easily damaged by use or disturbance.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

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.

Ground water. Water filling all the unblocked pores of the material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hard to pack (in tables). Difficult to compact using regular earthwork construction equipment.

Highly erodible (in tables). Soil has an erodibility index greater than 8 and is very susceptible to erosion by water.

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:

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.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

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.

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.

Infrequent flooding (in tables). Flooding occurs at an interval that limits riparian plant species.

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

Intermittent stream. A stream, or reach of a stream, that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Iron depletions. Low-chroma zones having a low content of iron and manganese oxide because of chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Ksat. Saturated hydraulic conductivity. (See Permeability.)

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

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.

Loamy soil. Coarse sandy loam, sandy loam, fine sandy loam, very fine sandy loam, loam, silt loam, silt, clay loam, sandy clay loam, or silty clay loam.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low adsorption (in tables). Low amounts of cations are adsorbed from wastes applied to the soil.

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.

Low strength. The soil is not strong enough to support loads.

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. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately deep soil. A soil that is 20 to 40 inches deep over bedrock or to other material that restricts the penetration of plant roots.

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).

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. If formed in place, nodules of iron oxide or manganese oxide are considered types of redoximorphic concentrations.

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

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called “a soil.” A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as “saturated hydraulic conductivity,” which is defined in the “Soil Survey Manual.” In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as “permeability.” Terms describing permeability, measured in inches per hour, are as follows:

Extremely slow	0.0 to 0.01 inch
Very slow	0.01 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

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid or very rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

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.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

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

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Redoximorphic concentrations. Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

Redoximorphic depletions. Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.
Redoximorphic features. Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.
Reduced matrix. A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.
Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.
Relief. The elevations or inequalities of a land surface, considered collectively.
Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.
Riverwash. Unstable areas of sandy, silty, clayey, or gravelly sediments. These areas are flooded, washed, and reworked by rivers so frequently that they support little or no vegetation.
Road cut. A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.
Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.
Rock outcrop. Exposures of bare bedrock other than lava flows and rock-lined pits.
Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.
Root zone. The part of the soil that can be penetrated by plant roots.
Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.
Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.
Sandy soil. Sand or loamy sand.
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.
Seasonally ponded (in tables). Standing water on soils in closed depressions that is removed only by percolation or evapotranspiration. Generally occurs during the winter and early spring.
Seasonal wetness (in tables). The soil may be wet during the period of desired use. This usually occurs during the winter and early spring.
Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.
Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)
Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.
Shallow soil. A soil that is 10 to 20 inches deep over bedrock or to other material that restricts the penetration of plant roots.
Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.
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.
Side slope. A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel.
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 codominant trees

in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

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:

Level	0 to 1 percent
Nearly level	1 to 3 percent
Gently sloping	3 to 8 percent

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slope/erodibility (in tables). A combination of slope and susceptibility to water erosion may be restrictive in the use of this soil.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil reaction (in tables). A measure of acidity or alkalinity of a soil, expressed in pH values, which indicates that the soil reaction is either too high or too low for the intended use.

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.

Stickiness (surface) (in tables). The soil is slippery and sticky when wet and slow to dry.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

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

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material that is too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Too acid (in tables). The soil is so acid that growth of plants is restricted.

Too clayey (in tables). The soil is slippery and sticky when wet and slow to dry.

Too sandy (in tables). The soil is soft and loose, droughty, and low in fertility or is too fine to use as gravel.

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.

Trafficability. The degree to which a soil is capable of supporting vehicular traffic across a wide range in soil moisture conditions.

Upland. Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Very deep soil. A soil that is more than 60 inches deep over bedrock or to other material that restricts the penetration of plant roots.

Very shallow soil. A soil that is less than 10 inches deep over bedrock or to other material that restricts the penetration of plant roots.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Wetness (in tables). The soil is wet during the period of desired use.

Windthrow. The uprooting and tipping over of trees by the wind.