United States
Department of
Agriculture

Natural
Resources
Conservation
Service

In cooperation with the
Illinois Agricultural
Experiment Station

Soil Survey of Fulton County, Illinois

Part I

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How To Use This Soil Survey

This survey is divided into three parts. Part I includes general information about the survey area; descriptions of the general soil map units, detailed soil map units, and soil series in the area; and a description of how the soils formed. Part II describes the use and management of the soils and the major soil properties. This part may be updated as further information about soil management becomes available. Part III includes the maps.

On the **general soil map**, the survey area is divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

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

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** in Part I of this survey, which lists the map units by symbol and name and shows the page where each map unit is described.

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

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

Major fieldwork for this soil survey was completed in 1994. Soil names and descriptions were approved in 1997. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1994. This survey was made cooperatively by the Natural Resources Conservation Service; the United States Department of Agriculture, Forest Service; and the Illinois Agricultural Experiment Station. The Illinois Department of Natural Resources provided a soil scientist to assist with the fieldwork. The survey is part of the technical assistance furnished to the Fulton County Soil and Water Conservation District.

Cover: Overlooking the Rozetta-Keomah-Camden association on the flood plain along the Spoon River in Fulton County, Illinois.

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

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Issued 2001

Foreword

This soil survey contains information that can be used in land-planning programs in Fulton 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, 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. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

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State Conservationist
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Soil Survey of
Fulton County, Illinois

By Steven E. Suhl, Natural Resources Conservation Service

Fieldwork by Steven E. Suhl, Sue A. Aszman, James K. Hornickel, Dale E. Calsyn, and Kim D. Smail, Natural Resources Conservation Service

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

FULTON COUNTY is in west-central Illinois (fig. 1). It is bounded on the east by the Illinois River, on the south by Schuyler County, on the west by McDonough and Warren Counties, and on the north by Knox and Peoria Counties.

Fulton County has an area of 869 square miles, or 557,023 acres. In 1990, according to the U.S. census, the population of the county was 38,080. The largest population center at that time was Canton, which had 13,922 residents.

This soil survey updates the survey of Fulton County published in 1932 (Smith and others, 1932). It provides additional information and has larger maps, which show the soils in greater detail.

General Nature of the County

This section provides general information about Fulton County. It describes climate; history and development; farming and industry; physiography, relief, and drainage; and transportation facilities.

Climate

Table 1 gives data on temperature and precipitation for the survey area as recorded at Havana in the period 1961 to 1990. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on the length of the growing season.

In winter, the average temperature is 27 degrees F and the average daily minimum temperature is 17.9 degrees. The lowest temperature on record, which occurred at Havana on January 15, 1979, is -26 degrees. In summer, the average temperature is 74.6 degrees and the average daily maximum temperature is 86.3 degrees. The highest temperature, which occurred on August 19, 1983, is 106 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 37.32 inches. Of this, 22.25 inches, or about 60 percent, usually falls in April through September. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period of record was 4.35 inches at Havana on May 20, 1984. Thunderstorms occur on about 48 days each year, and most occur June.

The average seasonal snowfall is 26 inches. The greatest snow depth at any one time during the period of record was 20 inches, recorded on January 28, 1979. On an average, 30 days per year have at least 1 inch of snow on the ground. The heaviest 1-day snowfall on record, 10.5 inches, was recorded on January 19, 1987.

The average relative humidity in midafternoon is about 61 percent. Humidity is higher at night, and the average at dawn is about 83 percent. The sun shines 67 percent of the time possible in summer and 46

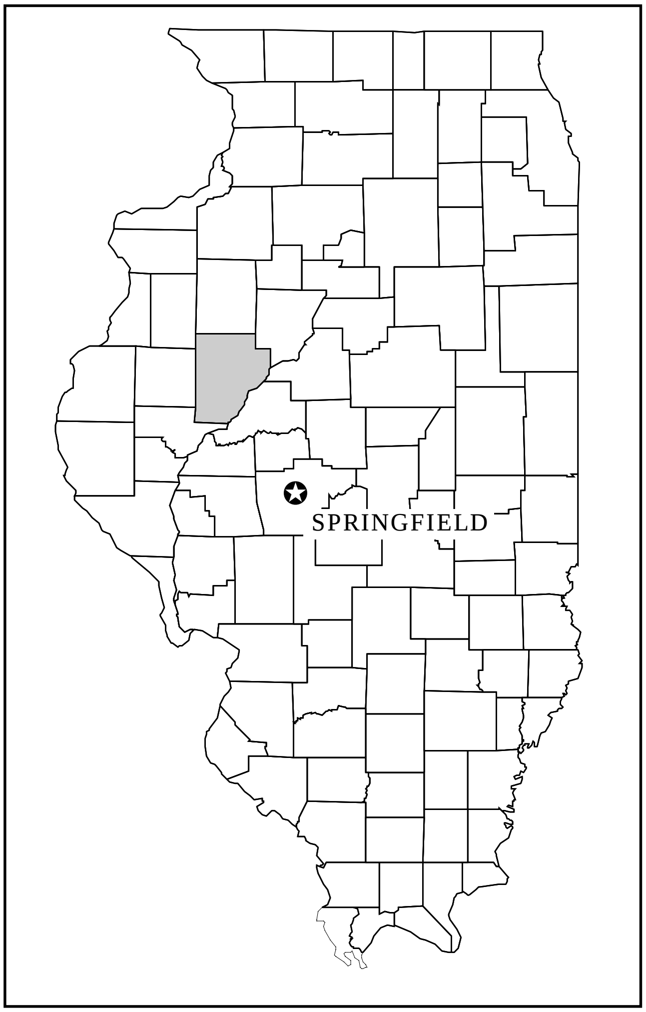

Figure 1.—Location of Fulton County in Illinois.

percent in winter. The prevailing wind is from the south. Average windspeed is highest, 12.1 miles per hour, in March.

History and Development

Prior to settlement, the survey area was characterized by abundant wildlife, native prairies, and forests. The land was first occupied by early Indians, who hunted ice-age animals and lived a nomadic lifestyle. As the climate changed and the ice-age animals disappeared, these people began to form permanent settlements. They began to domesticate animals and cultivate crops. Some Indian settlements prospered into large communities, such as those around Dickson Mounds near Lewistown. These settlements thrived until they were destroyed by disease or warfare (Clark, 1969).

The first permanent settler, John Everland, came from Kentucky in the spring of 1820. He settled in an area near the current town of Waterford.

Lewistown, the county seat, was founded in 1822 by Ossin Ross, a veteran of the War of 1812 who came to the Military Tract to claim his bounty land. The Military Tract was land given in payment by the U.S. Government to those who fought in the War of 1812. The town was named for Ross's eldest son, Lewis (Fulton County Historical and Geological Society, 1879).

Fulton County was formed by an act of the Illinois General Assembly on January 28, 1823. The original northern boundary reached to the Wisconsin border, and the county included Chicago and all present metropolitan areas upstate. The town of Canton was laid out in 1825 and incorporated in 1837. The county was named in honor of Robert Fulton, who is credited with being the inventor of the steamboat.

Farming and Industry

Farming is the most important enterprise in the county. In 1992, according to the U.S. census, there were 1,165 farms in the county and farmland made up a total of 431,415 acres. The average farm size was 370 acres. A total of 309,857 acres in the county is used as cropland. Of this total, about 136,118 acres is planted to corn, 112,823 acres to soybeans, and 10,665 acres to wheat. In 1992, the county had 30,988 cattle and calves and 22,015 hogs and pigs.

In the past, coal mining was very important to the local economy. In 1855, David Williams established the first surface mine, north of Canton. By 1965, Fulton County had become the leading coal-producing area in Illinois. At one time the county had the largest area of surface-mined land in the world. Today, however, only one mine remains in operation.

An abundant supply of sand and gravel is available in scattered areas throughout the county. The most extensive deposits are along the Illinois River and Spoon River systems.

Physiography, Relief, and Drainage

Fulton County is in the southeastern part of the Galesburg Plain, a part of the Till Plains Section of the Central Lowland Province. The Galesburg Plain was developed by Illinoian glaciers about 250,000 years ago. Since that time, the area has been eroded and covered by windblown silt. Prior to glaciation, an extensive system of valleys had become deeply entrenched into the bedrock surface. Many of the major features of the Galesburg Plain, such as the

Illinois and Spoon Rivers in Fulton County, have been determined largely by the preglacial topography.

The highest elevation in the county, 750 feet, is at Haney Hill, which is northwest of Ellisville. The lowest elevation, about 430 feet, is in drained backwater lakes in the southern part of the flood plain along the Illinois River.

The Spoon River and its tributaries drain the majority of the western two-thirds of the county into the Illinois River. The eastern one-third of the county drains into the Illinois River via Copperas Creek and other smaller tributaries. The Illinois River forms the southeastern boundary of the county.

Transportation Facilities

Early settlers used the numerous Indian trails that crossed the area. Some roads today follow the original Indian trail routes. In 1850, a plank toll road was constructed from Liverpool, along the Illinois River, to Canton. The wooden planks were necessary to keep the tremendous amounts of heavy freight from sinking into the soft soil.

Ford crossings were few and far between. Harper's Riffle, south of Seville, had a solid rock bottom and shallow water. It provided a crossing place for the old stagecoach line from St. Augustine to Bernodotte (Reinersten and others, 1993). As the population of the area grew and travel became more important, ferries became a common and more dependable mode of river crossing.

Today, transportation facilities are good throughout the county. U.S. Highways 24 and 136 cross the county. State Highways 41, 9, 95, 97, 116, 78, and 100 provide good access to most parts of the county. Several railroads provide freight service. Barge service is available on the Illinois River along the eastern edge of the county.

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.

The descriptions and soil maps in this survey reflect conditions in the survey area at the time when fieldwork was completed. They may reflect active mining and/or reclamation. More recent reclamation practices or changes in soil classifications may change the mapping, classification, and interpretations of minesoils. At the time of publication, long-term crop yield information, which is typically used for yield estimates, was not available for minesoils. The users of this survey should contact the Illinois Department of Natural Resources, Office of Mines and Minerals, Land Reclamation Division, for current and site-specific information.

General Soil Map Units

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

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

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

The county general soil map also serves as a subset to the State Soil Geographic Database (STATSGO). STATSGO is a state collection of county general soil maps available in both digital and printed formats. As county general soil maps are developed and updated, the archived version of STATSGO will be updated and made available to all users.

1. Ipava-Sable Association

Nearly level, somewhat poorly drained and poorly drained, silty soils that formed in loess; on uplands

Setting

• This association consists of soils on upland drainage divides. The typical landscape is one of broad plains with little relief. Ipava soils are on summits of broad rises upslope from the Sable soils in low-lying areas (fig. 2).

Composition

Percent of the survey area: 8
Extent of the components in the association:
Ipava soils—60 percent
Sable soils—30 percent
Minor soils—10 percent

Soil Properties and Qualities

Ipava

Depth class: Very deep
Drainage class: Somewhat poorly drained
Parent material: Loess
Texture of the surface layer: Silt loam
Slope class: Nearly level

Sable

Depth class: Very deep
Drainage class: Poorly drained
Parent material: Loess
Texture of the surface layer: Silty clay loam
Slope class: Nearly level

Minor Soils

• The well drained Osco soils in the more sloping areas on shoulders of side slopes along drainageways

Use and Management

Major uses: Cropland
Other uses: Sites for dwellings or septic tank absorption fields
Major management concerns:
• Wetness is a factor affecting cropland. Soil tilth and ponding are additional concerns in areas of the Sable soils.
• The seasonal high water table, the shrink-swell potential, and restricted permeability are concerns affecting the use of the Ipava soils as sites for dwellings or septic tank absorption fields. The Sable soils are unsuited to these uses because of the ponding.

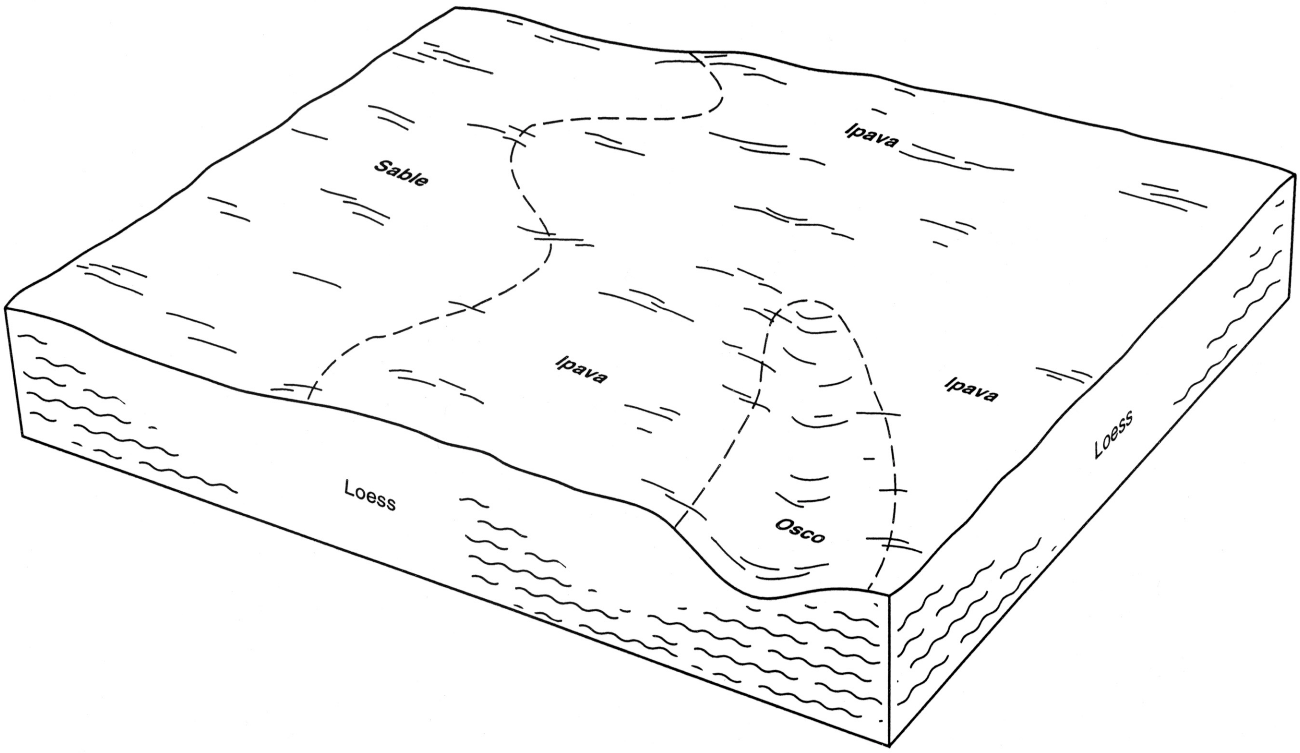

Figure 2.—Typical pattern of soils and parent material in the Ipava-Sable association.

2. Ipava-Osco Association

Nearly level to moderately sloping, well drained and somewhat poorly drained, silty soils that formed in loess; on uplands

Setting

• This association consists of soils on upland drainage divides. The typical landscape is mainly gently rolling ridges with long, smooth slopes, except along drainageways, where the slopes are shorter. Osco soils are on summits and shoulders of knolls upslope from the Ipava soils. Ipava soils are in the less sloping positions on the landscape (fig. 3).

Composition

Percent of the survey area: 8
Extent of the components in the association:
Ipava soils—46 percent
Osco soils—40 percent
Minor soils—14 percent

Soil Properties and Qualities

Ipava

Depth class: Very deep
Drainage class: Somewhat poorly drained
Parent material: Loess
Texture of the surface layer: Silt loam
Slope class: Nearly level

Osco

Depth class: Very deep
Drainage class: Well drained
Parent material: Loess
Texture of the surface layer: Silt loam
Slope class: Gently sloping and moderately sloping

Minor Soils

• The well drained Greenbush soils on shoulders of side slopes along drainageways
• The poorly drained Sable soils downslope from the major soils in shallow drainageways

Use and Management

Major uses: Cropland
Other uses: Sites for dwellings or septic tank absorption fields
Major management concerns:
• Wetness is a factor affecting cropland in areas of the

Ipava soils, and erosion is a hazard in areas of the Osco soils.

• The seasonal high water table and the shrink-swell potential are concerns affecting the use of these soils as sites for dwellings or septic tank absorption fields. Restricted permeability is an additional concern in areas of the Osco soils.

3. Rozetta-Keomah-Clarksdale Association

Nearly level to moderately sloping, well drained and somewhat poorly drained, silty soils that formed in loess; on uplands

Setting

• This association consists of soils on upland interfluves. The typical landscape is characterized by broad ridges separated by narrow drainageways. Clarksdale and Keomah soils are in areas of little relief on summits of broad ridges. Rozetta soils are in the more sloping positions on summits of the narrower ridges and are on shoulders of side slopes along drainageways (fig. 4).

Composition

Percent of the survey area: 23

Extent of the components in the association:

Rozetta and similar soils—53 percent
Keomah soils—16 percent
Clarksdale soils—12 percent
Minor soils—19 percent

Soil Properties and Qualities

Rozetta

Depth class: Very deep
Drainage class: Well drained
Parent material: Loess
Texture of the surface layer: Silt loam or silty clay loam
Slope class: Gently sloping and moderately sloping

Keomah

Depth class: Very deep

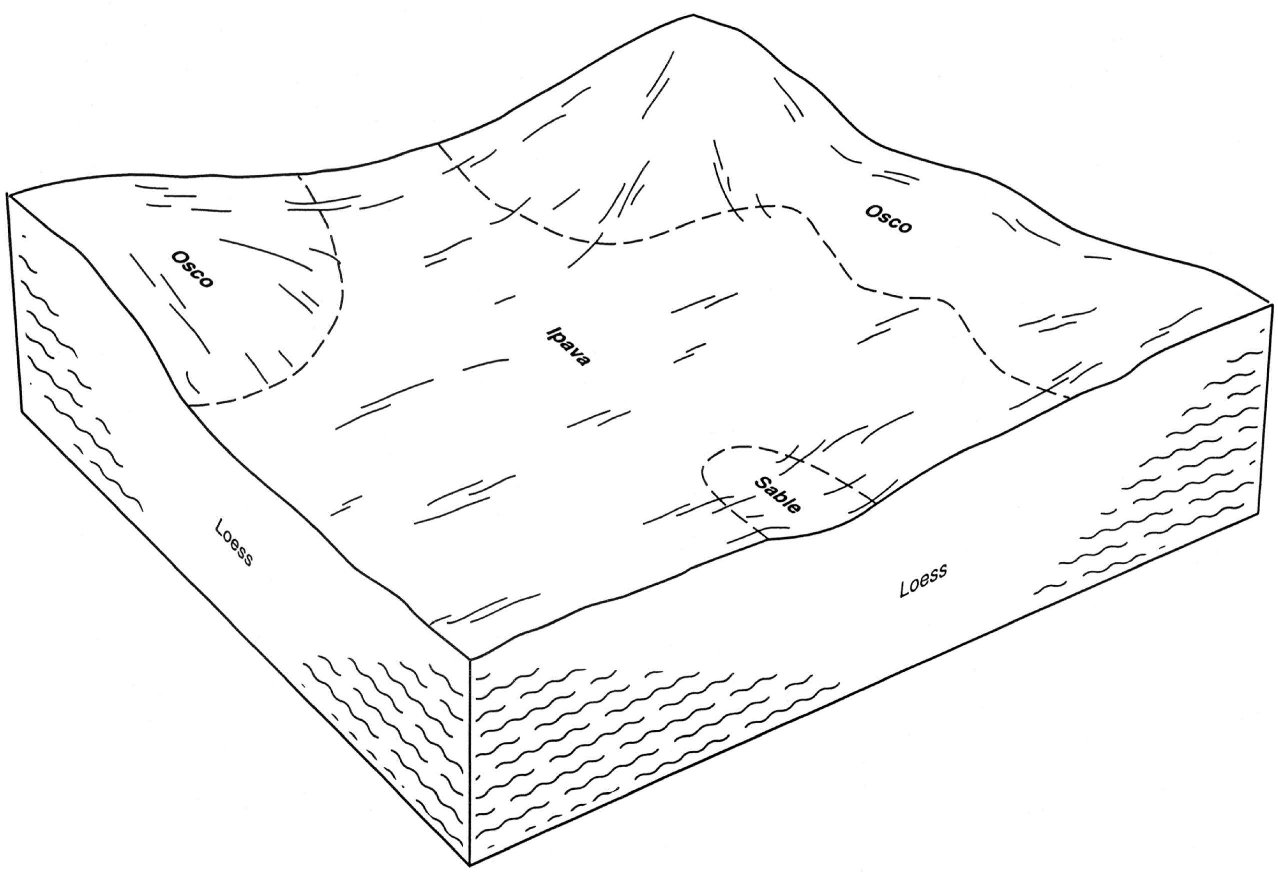

Figure 3.—Typical pattern of soils and parent material in the Ipava-Osco association.

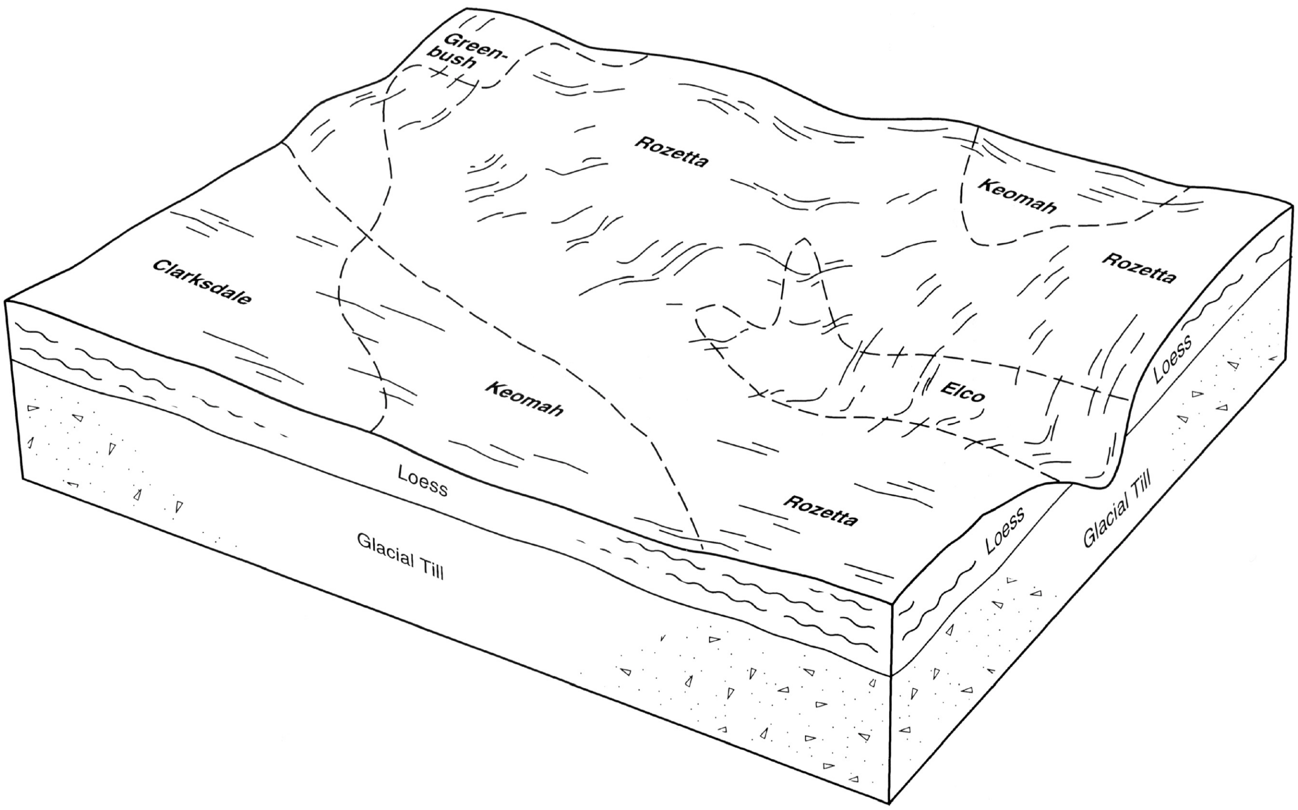

Figure 4.—Typical pattern of soils and parent material in the Rozetta-Keomah-Clarksdale association.

Drainage class: Somewhat poorly drained
Parent material: Loess
Texture of the surface layer: Silt loam
Slope class: Nearly level

Clarksdale

Depth class: Very deep
Drainage class: Somewhat poorly drained
Parent material: Loess
Texture of the surface layer: Silt loam
Slope class: Nearly level

Minor Soils

- The moderately well drained Elco soils, which are downslope from the major soils on shoulders of side slopes along drainageways
- The well drained Greenbush soils on shoulders of side slopes along drainageways

Use and Management

Major uses: Cropland; pasture and hay
Other uses: Sites for dwellings or septic tank absorption fields

Major management concerns:
- Crusting is a concern affecting cropland. Wetness is an additional concern in areas of the Clarksdale and Keomah soils, and erosion is a hazard in areas of the Rozetta soils.
- Low pH is a factor affecting pasture and hay. Erosion is a hazard in areas of the Rozetta soils, and low fertility is an additional concern in severely eroded areas.
- The seasonal high water table and the shrink-swell potential are concerns affecting the use of these soils as sites for dwellings or septic tank absorption fields. Restricted permeability is an additional concern in areas of the Clarksdale and Keomah soils.

4. Hickory-Rozetta Association

Gently sloping to very steep, well drained, loamy and silty soils that formed in loess and glacial till or in loess; on uplands

Setting

- This association consists of soils on dissected uplands. The typical landscape is characterized by ridges bounded by deeply entrenched drainageways. Rozetta soils are on summits of ridges and on shoulders of side slopes along drainageways. Hickory soils are generally in the mid or lower backslope positions, downslope from the Rozetta soils. Outcrops of bedrock are common along the base of the steeper slopes (fig. 5).

Composition

Percent of the survey area: 28
Extent of the components in the association:
Hickory soils—43 percent
Rozetta soils—41 percent
Minor soils—16 percent

Soil Properties and Qualities

Hickory

Depth class: Very deep
Drainage class: Well drained
Parent material: Loess and the underlying glacial till
Texture of the surface layer: Silt loam or loam
Slope class: Strongly sloping to very steep

Rozetta

Depth class: Very deep
Drainage class: Well drained
Parent material: Loess
Texture of the surface layer: Silt loam
Slope class: Gently sloping and moderately sloping

Minor Soils

- The moderately well drained Elco soils, which are downslope from the Rozetta soils on shoulders and on the upper backslopes and are upslope from the Hickory soils
- The somewhat poorly drained Lawson and Wakeland soils downslope from the major soils on narrow flood plains
- The well drained Marseilles soils downslope from the Hickory soils on the lower backslopes

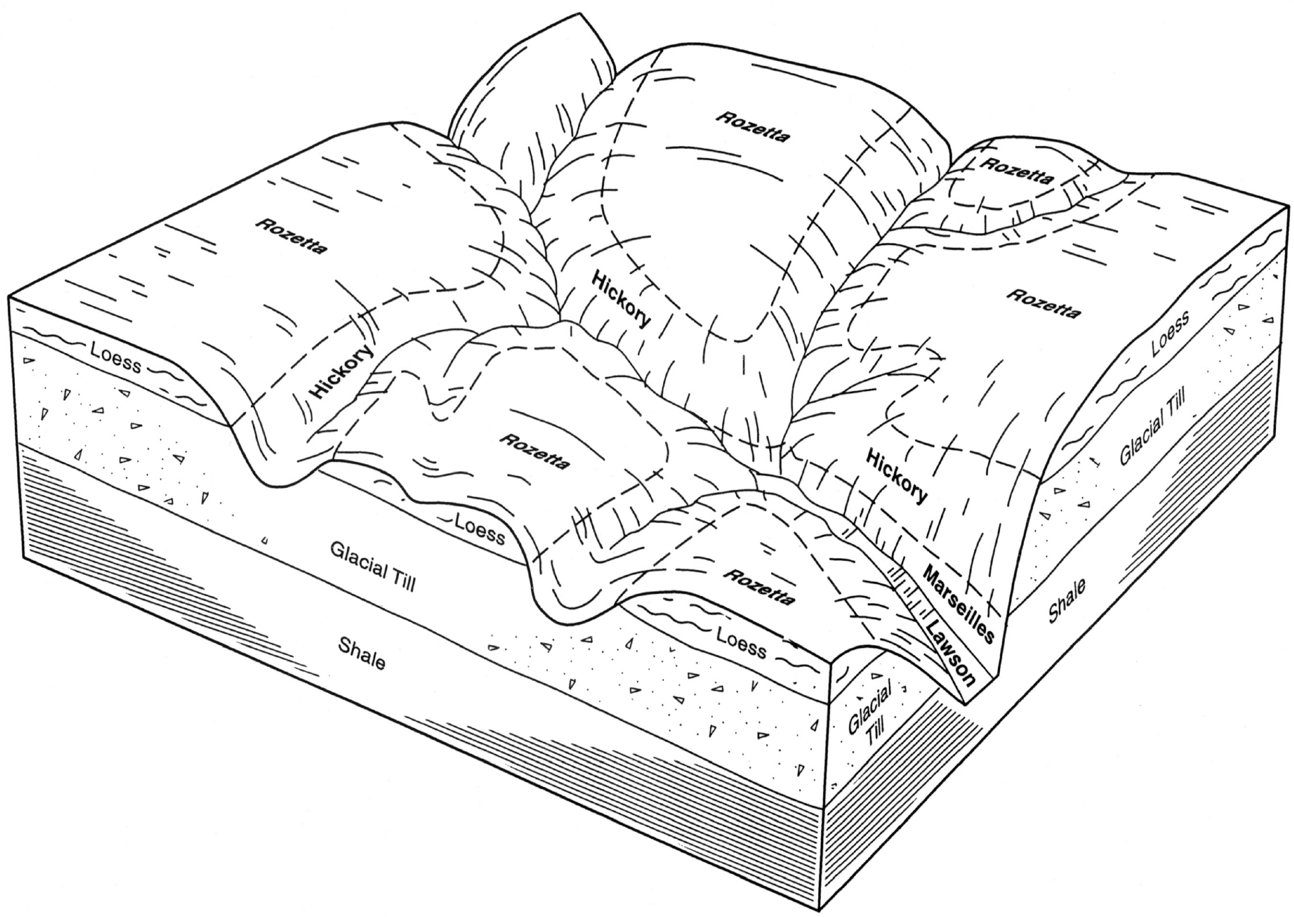

Figure 5.—Typical pattern of soils and parent material in the Hickory-Rozetta association.

Use and Management

Major uses: Woodland, pasture and hay, cropland
Other uses: Sites for dwellings or septic tank absorption fields
Major management concerns:
• Erosion, equipment limitations, and plant competition are concerns affecting woodland.
• Only the Rozetta soils and the less sloping areas of Hickory soils are suited to pasture and hay. Low pH and the hazard of erosion are concerns affecting these uses. The equipment limitation is an additional concern in areas of the Hickory soils.
• Only the Rozetta soils are suited to cropland. Crusting and the hazard of erosion are management concerns.
• The shrink-swell potential and the slope are concerns affecting the use of these soils as sites for dwellings or septic tank absorption fields.

5. Fayette-Seaton-Hickory Association

Gently sloping to very steep, well drained, silty and loamy soils that formed in loess or in loess and glacial till; on uplands

Setting

• This association consists of soils on dissected uplands along major rivers. The typical landscape is characterized by narrow ridges bounded by deeply entrenched drainageways. Fayette soils are on shoulders and the upper backslopes of side slopes. Hickory and Seaton soils are in positions downslope from the Fayette soils. Seaton soils are generally in mid positions on backslopes, and Hickory soils are in the lowest positions on the backslopes. Outcrops of bedrock are common along the base of the steeper slopes (fig. 6).

Composition

Percent of the survey area: 9
Extent of the components in the association:
Fayette soils—48 percent
Seaton soils—22 percent
Hickory soils—11 percent
Minor soils—19 percent

Soil Properties and Qualities

Fayette

Depth class: Very deep
Drainage class: Well drained
Parent material: Loess
Texture of the surface layer: Silt loam
Slope class: Gently sloping to moderately steep

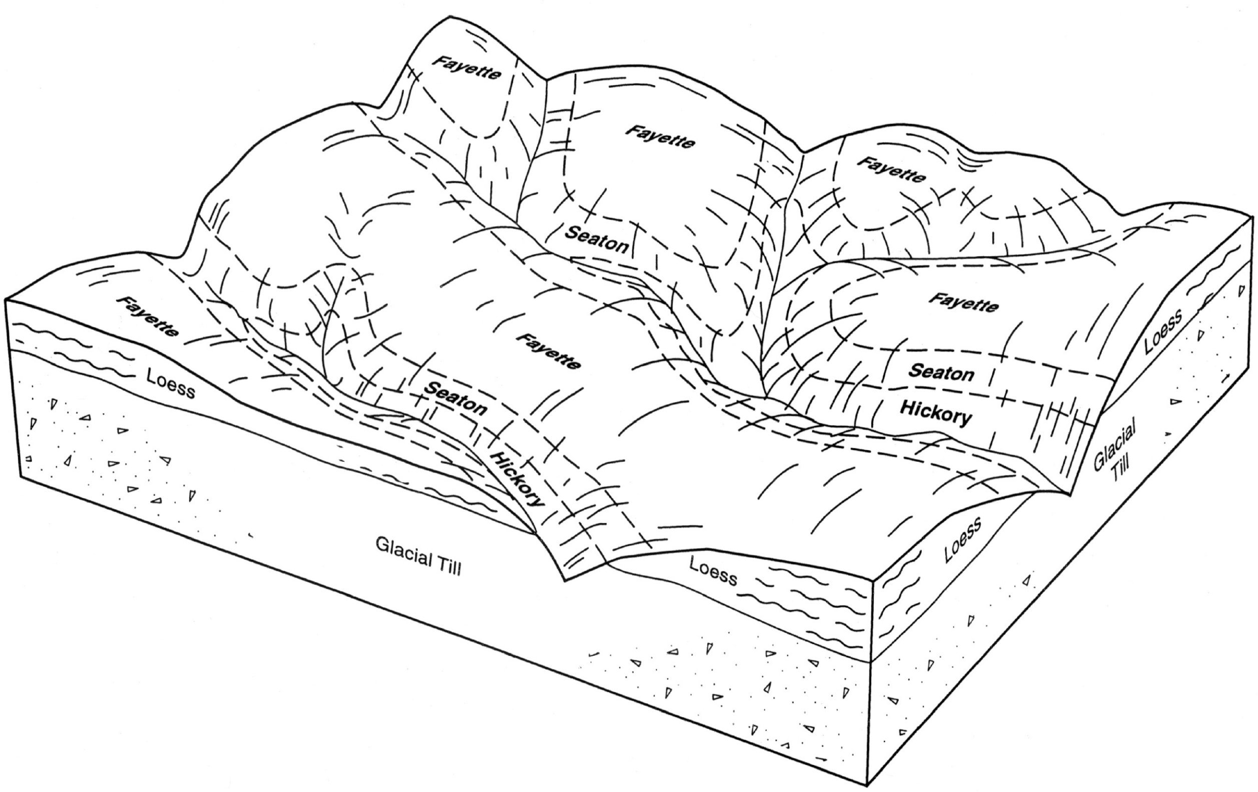

Figure 6.—Typical pattern of soils and parent material in the Fayette-Seaton-Hickory association.

Seaton

Depth class: Very deep
Drainage class: Well drained
Parent material: Loess
Texture of the surface layer: Silt loam
Slope class: Moderately steep to very steep

Hickory

Depth class: Very deep
Drainage class: Well drained
Parent material: Loess and the underlying glacial till
Texture of the surface layer: Silt loam or loam
Slope class: Moderately steep to very steep

Minor Soils

- The well drained Sylvan soils on shoulders of side slopes
- The well drained Marseilles soils in positions on backslopes lower than those of the Hickory soils

Use and Management

Major uses: Woodland, pasture and hay, cropland
Other uses: Sites for dwellings or septic tank absorption fields
Major management concerns:
- Erosion, equipment limitations, seedling mortality, and plant competition are concerns affecting woodland.
- Only the Fayette soils and the less sloping areas of the Hickory and Seaton soils are suited to pasture and hay. Low pH and erosion are concerns affecting these uses. The equipment limitation is an additional concern in areas of the Hickory soils and in the more sloping areas of the Fayette soils.
- Only the less sloping areas of the Fayette soils are suited to cropland. Crusting and the hazard of erosion are concerns.
- The slope is a concern affecting the use of these soils as sites for dwellings or septic tank absorption fields.

6. Wakeland-Tice-Beaucoup Association

Nearly level, somewhat poorly drained and poorly drained, silty soils that formed in alluvium; on flood plains

Setting

- This association consists of soils on flood plains. These soils are frequently flooded. The typical landscape is characterized by little relief. Beaucoup soils are in low-lying areas, and Tice and Wakeland soils are on summits of broad rises. Old channel scars and silted-in oxbows are in some narrow streambeds and on creek bottoms (fig. 7).

Composition

Percent of the survey area: 8
Extent of the components in the association:
Wakeland and similar soils—31 percent
Tice and similar soils—30 percent
Beaucoup and similar soils—21 percent
Minor soils—18 percent

Soil Properties and Qualities

Wakeland

Depth class: Very deep
Drainage class: Somewhat poorly drained
Parent material: Alluvium
Texture of the surface layer: Silt loam
Slope class: Nearly level

Tice

Depth class: Very deep
Drainage class: Somewhat poorly drained
Parent material: Alluvium
Texture of the surface layer: Silty clay loam
Slope class: Nearly level

Beaucoup

Depth class: Very deep
Drainage class: Poorly drained
Parent material: Alluvium
Texture of the surface layer: Silty clay loam
Slope class: Nearly level

Minor Soils

- The well drained Huntsville soils in the slightly higher positions on the landscape
- The poorly drained Quiver soils in the lowest positions on the landscape

Use and Management

Major uses: Cropland, woodland
Major management concerns:
- Flooding is a concern affecting cropland. Ponding and soil tilth are additional concerns in areas of the Beaucoup and Tice soils, and wetness is an additional concern in areas of the Wakeland soils.
- Plant competition is a concern affecting woodland in areas of the Tice and Wakeland soils. Seedling mortality and the windthrow hazard are concerns in areas of the Beaucoup soils.
- The soils in this association are not suited to use as

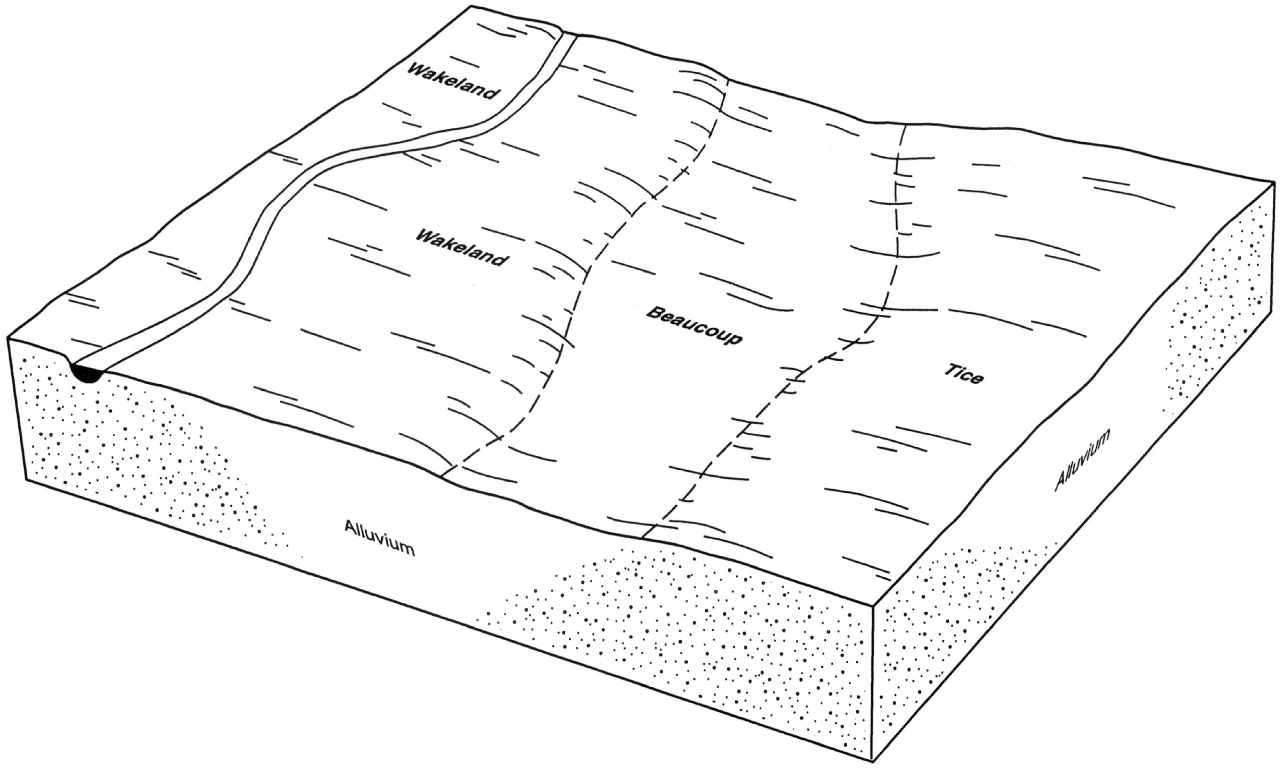

Figure 7.—Typical pattern of soils and parent material in the Wakeland-Tice-Beaucoup association.

sites for dwellings or septic tank absorption fields because of the flooding.

7. Titus-Beaucoup-Tice Association

Nearly level, somewhat poorly drained and poorly drained, clayey and silty soils that formed in alluvium; on flood plains

Setting

• This association consists of soils on flood plains along the Illinois River. These soils are occasionally flooded. Most areas are protected by a system of levees. The typical landscape is characterized by little relief. Tice soils are on summits of broad rises, and Beaucoup and Titus soils are in low-lying areas on flood plains. Titus soils are generally in the lowest positions on the landscape. Shallow depressions, remnants of old ponds and lakebeds, and former stream channels are common throughout the flood plain (fig. 8).

Composition

Percent of the survey area: 5

Extent of the components in the association:

Titus soils—40 percent
Beaucoup and similar soils—23 percent
Tice and similar soils—12 percent
Minor soils—25 percent

Soil Properties and Qualities

Titus

Depth class: Very deep
Drainage class: Poorly drained
Parent material: Alluvium
Texture of the surface layer: Silty clay
Slope class: Nearly level

Beaucoup

Depth class: Very deep
Drainage class: Poorly drained
Parent material: Alluvium
Texture of the surface layer: Silty clay loam
Slope class: Nearly level

Tice

Depth class: Very deep
Drainage class: Somewhat poorly drained

Parent material: Alluvium
Texture of the surface layer: Silty clay loam
Slope class: Nearly level

Minor Soils

• The somewhat poorly drained Orion soils on summits of broad rises
• The well drained Worthen soils on alluvial fans adjacent to the bluffs

Use and Management

Major uses: Cropland
Major management concerns:
• Flooding and soil tilth are concerns affecting cropland. Ponding is an additional concern in areas of the Beaucoup and Titus soils.
• The soils in this association are not suited to use as sites for dwellings or septic tank absorption fields because of the flooding.

8. Rozetta-Keomah-Camden Association

Nearly level to strongly sloping, well drained and somewhat poorly drained, silty soils that formed in loess or in loess and the underlying outwash; on stream terraces

Setting

• This association consists of soils on stream terraces. The typical landscape is characterized by broad treads dissected by shallow drainageways. Keomah soils are in areas of little relief on treads. Rozetta soils are in the more sloping positions on treads and on the shoulders of slide slopes along drainageways. Camden soils are on risers (fig. 9).

Composition

Percent of the survey area: 2
Extent of the components in the association:
Rozetta and similar soils—39 percent
Keomah and similar soils—15 percent
Camden soils—14 percent
Minor soils—32 percent

Soil Properties and Qualities

Rozetta

Depth class: Very deep
Drainage class: Well drained

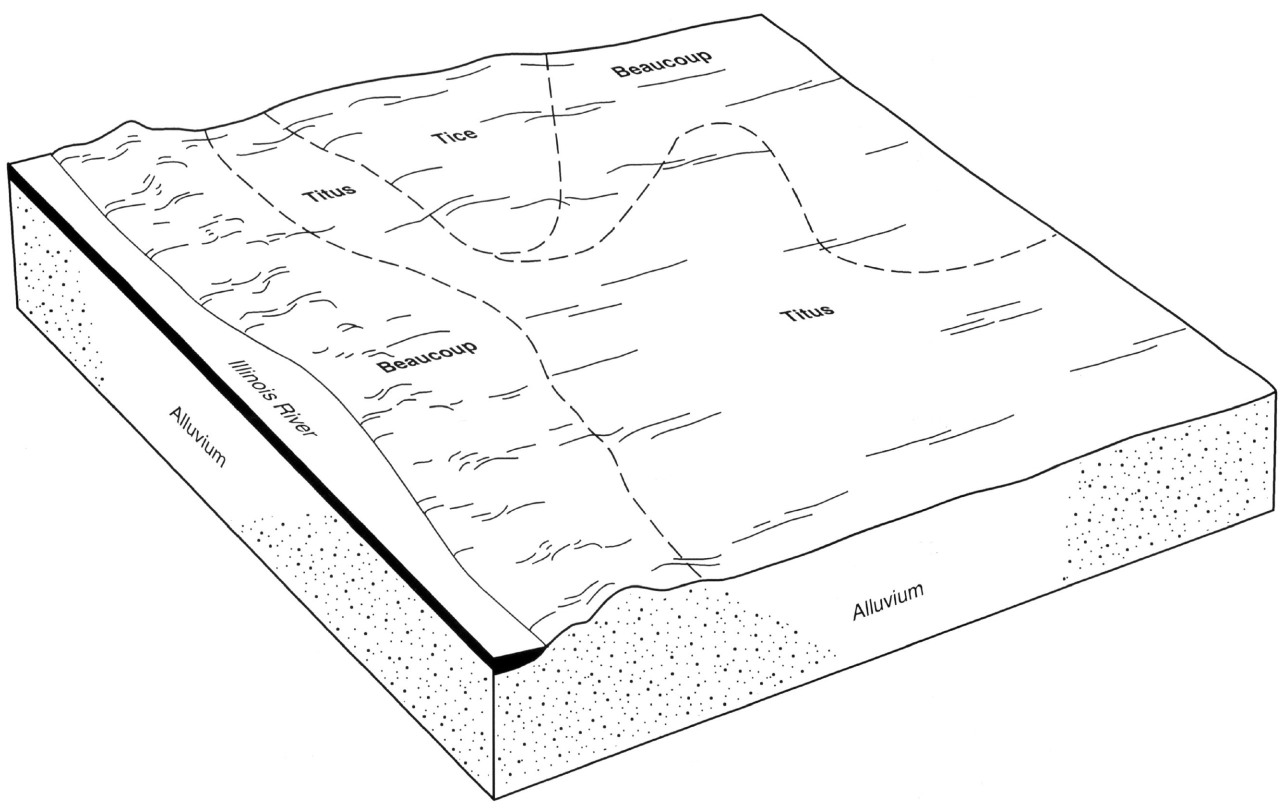

Figure 8.—Typical pattern of soils and parent material in the Titus-Beaucoup-Tice association.

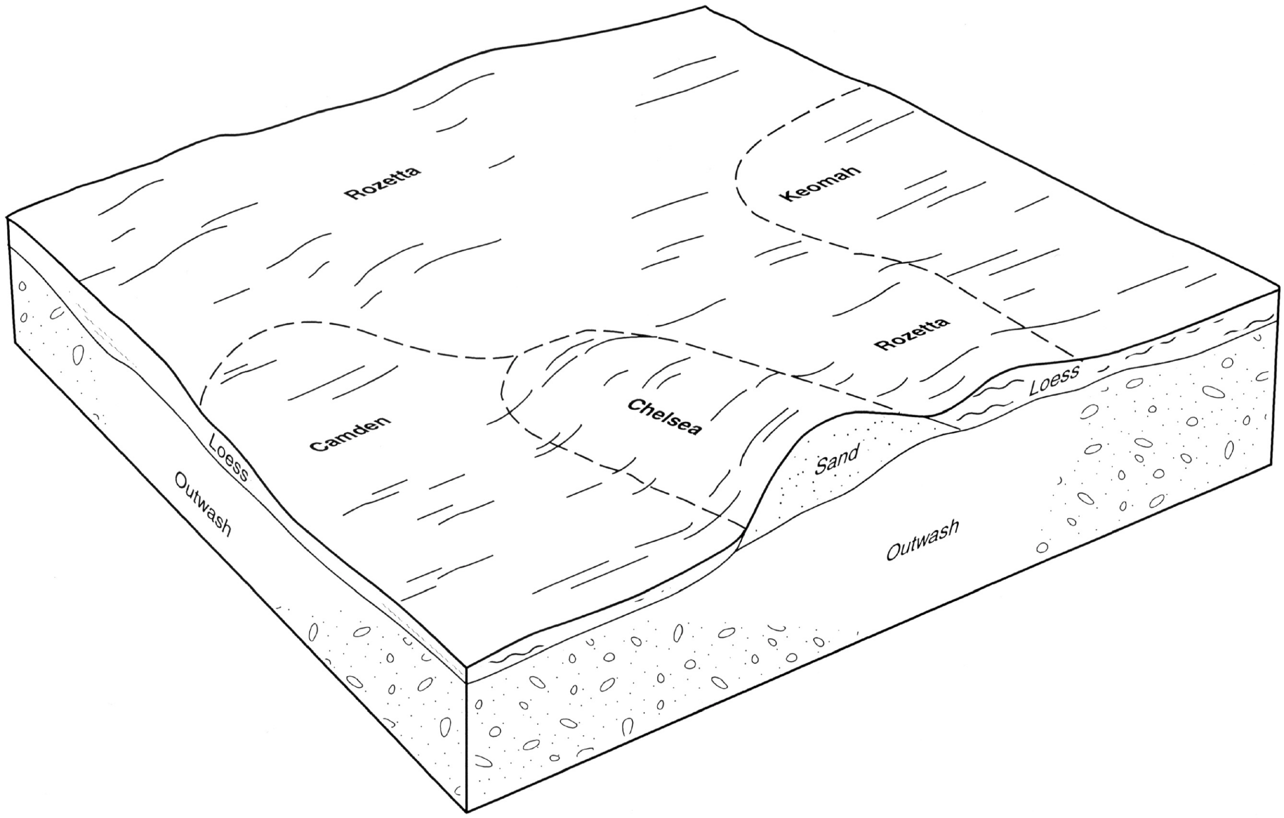

Figure 9.—Typical pattern of soils and parent material in the Rozetta-Keomah-Camden association.

Parent material: Loess
Texture of the surface layer: Silt loam
Slope class: Gently sloping and moderately sloping

Keomah

Depth class: Very deep
Drainage class: Somewhat poorly drained
Parent material: Loess
Texture of the surface layer: Silt loam
Slope class: Nearly level

Camden

Depth class: Very deep
Drainage class: Well drained
Parent material: Loess and the underlying outwash
Texture of the surface layer: Silt loam
Slope class: Moderately sloping and strongly sloping

Minor Soils

- The excessively drained Chelsea soils on dunelike ridges and backslopes of risers
- The well drained Dakota soils on shoulders and backslopes of risers on terraces along the Illinois River
- The moderately well drained Plano soils

Use and Management

Major uses: Cropland; pasture and hay
Other uses: Sites for dwellings or septic tank absorption fields
Major management concerns:
- Crusting is a concern affecting cropland. Wetness is an additional concern in areas of the Keomah soils, and the hazard of erosion is an additional concern in areas of the Camden and Rozetta soils.
- Low pH is a concern affecting pasture and hay. The hazard of erosion is an additional concern in areas of the Camden and Rozetta soils.
- The seasonal high water table and the shrink-swell potential are concerns affecting the use of these soils as sites for dwellings or septic tank absorption fields. Restricted permeability is an additional concern in areas of the Keomah soils.

9. Lenzburg-Lenzwheel Association

Nearly level to very steep, well drained, silty soils that formed in cast overburden from surface mining; on uplands

Setting

- This association consists of soils in graded and ungraded, surface-mined areas (fig. 10). The typical landscape in ungraded areas is characterized by prominent, narrow ridges with steep and very steep backslopes. The typical landscape in graded areas is characterized by ridges with nearly level and gently sloping summits and moderately sloping to moderately steep shoulders and backslopes. Lenzburg soils are in areas where the overburden was deposited in parallel ridges of about the same height. Lenzwheel soils also formed in overburden that was deposited in parallel ridges; minor ridges intersect the major ridge at about a 45 degree angle, and the resulting landscape has a herringbone pattern.

Composition

Percent of the survey area: 9

Extent of the components in the association:
Lenzburg soils—66 percent
Lenzwheel soils—20 percent
Minor components—14 percent

Soil Properties and Qualities

Lenzburg

Depth class: Very deep
Drainage class: Well drained
Parent material: Cast overburden
Texture of the surface layer: Silt loam or silty clay loam
Slope class: Nearly level to very steep

Lenzwheel

Depth class: Very deep
Drainage class: Well drained
Parent material: Cast overburden
Texture of the surface layer: Silt loam or silty clay loam
Slope class: Nearly level to very steep

Minor Components

- The somewhat poorly drained Ipava soils
- The well drained Rapatee soils in areas that have been reclaimed and are used for crop production

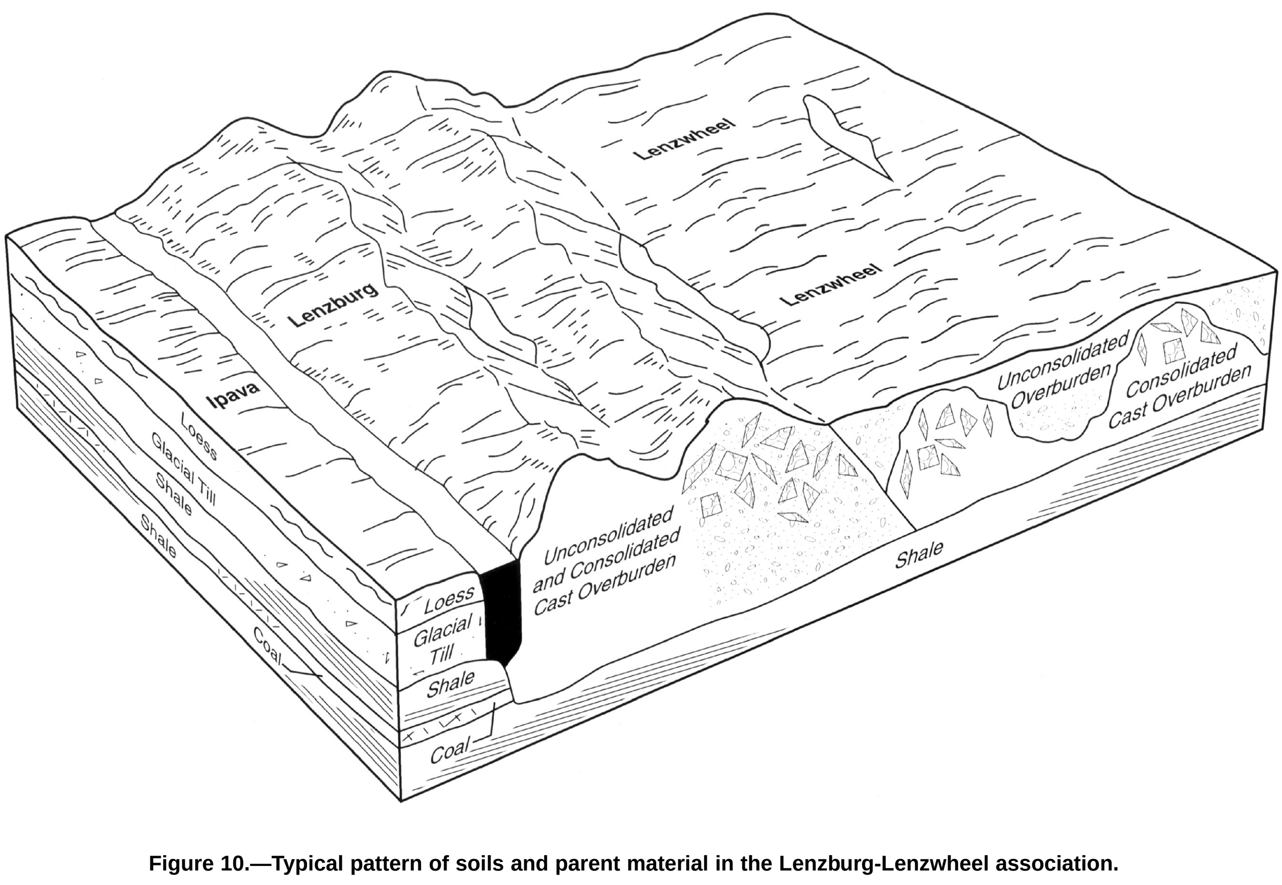

Figure 10.—Typical pattern of soils and parent material in the Lenzburg-Lenzwheel association.

• Orthents and dumps

Use and Management

Major uses: Woodland; pasture and hay
Other uses: Sites for dwellings or septic tank absorption fields
Major management concerns:
• Erosion, equipment limitations, and plant competition are concerns affecting woodland.
• Only the less sloping areas of these soils are suited to pasture and hay. Erosion is a major concern. The equipment limitation is also a concern in the more sloping areas.
• The shrink-swell potential, restricted permeability, and the slope are concerns affecting the use of these soils as sites for dwellings or septic tank absorption fields.

Formation and Classification of the Soils

This section relates the soils in the survey area to the major factors of soil formation and describes the system of soil classification.

A soil is a three-dimensional natural body consisting of mineral and organic material that can support plant growth. The nature of any soil at a given site is the result of the interaction of the factors of soil formation and their influence on the processes of soil formation.

Factors of Soil Formation

There are five factors of soil formation: parent material, climate, plants and animals, topography, and time. Climate and plants and animals act directly on parent material, which is modified by topography over time. Theoretically, if all these factors were identical at different sites, the soils at these sites would be identical. Differences among the soils are caused by variations in one or more of these factors.

Parent Material

Parent material is the unconsolidated geologic material in which the soil forms. It determines the basis for the chemical and mineralogical composition of the soil. The properties of the parent material vary greatly, sometimes within small areas, depending on how the material was deposited. The soils in Fulton County developed in a variety of parent materials. The majority of the soils formed in loess. Other soils formed in glacial drift, alluvium, eolian deposits, bedrock residuum, overburden from surface mining, or a combination of these. A generalized schematic relationship of some of the major soils and parent materials is shown in figure 11.

Glacial drift is glacially deposited sediment. There are two main types of glacial drift—till and outwash. Till is material that was deposited directly by glacial ice with little or no water action. It typically has particles that vary in size, including sand, silt, clay, and some pebbles, cobbles, and larger rock fragments. The small pebbles in till generally have distinct edges and corners, indicating that they have not been subject to intense washing by water. Till is well graded and unstratified. The composition averages 26 percent sand, 45 percent silt, and 29 percent clay. In Fulton County, till was deposited during the Illinoian age (Reinersten and others, 1993). The soils that formed in till deposits are of moderate extent in Fulton County. Hickory soils are examples of soils that formed in till.

During the Sangamon interglacial stage, which occurred between the Illinoian and Wisconsinan stages, the relatively flat, stable till surface was exposed to intense weathering. A soil formed in the till surface and was subsequently buried by depositions of loess. In Fulton County, the loess deposits were thick enough to remove the soil from the influence of the active soil-forming processes. The soils that formed in the till are called paleosols, and they reflect the conditions during which their formation occurred. Two types of paleosols occur in the county—buried and exhumed. A buried paleosol is no longer subject to the soil-forming processes that created it. In some landscape positions, however, where the loess deposits are thinner, the current processes of soil formation have extended through the loess and into the upper part of the paleosol. The result is a welded soil profile. Elco soils are examples of soils that formed in these areas. An exhumed paleosol occurs in areas where erosion has removed the overlying loess deposits and exposed the paleosol to the modern soil surface. Atlas soils are examples.

Outwash includes all sediments deposited by running water from melting glaciers. The size of the particles that can be transported by water, either as bedload or suspended sediments, depends on the gradient, volume, and velocity of the moving water. Water velocity decreases when a stream loses grade or flows into a larger body of water. As the velocity decreases, suspended particles begin to settle out. The coarser materials, such as gravel and cobbles, are deposited nearer to the source; the finer materials, such as fine sands, silts, and clays, are carried farther downstream. The pebbles in outwash generally have rounded edges and corners, indicating that they have been subject to intense washing by water. Outwash is poorly graded, is stratified, and has variable composition because of variations in the flow of water. Outwash is generally permeable. The outwash in Fulton County was deposited during the Wisconsinan

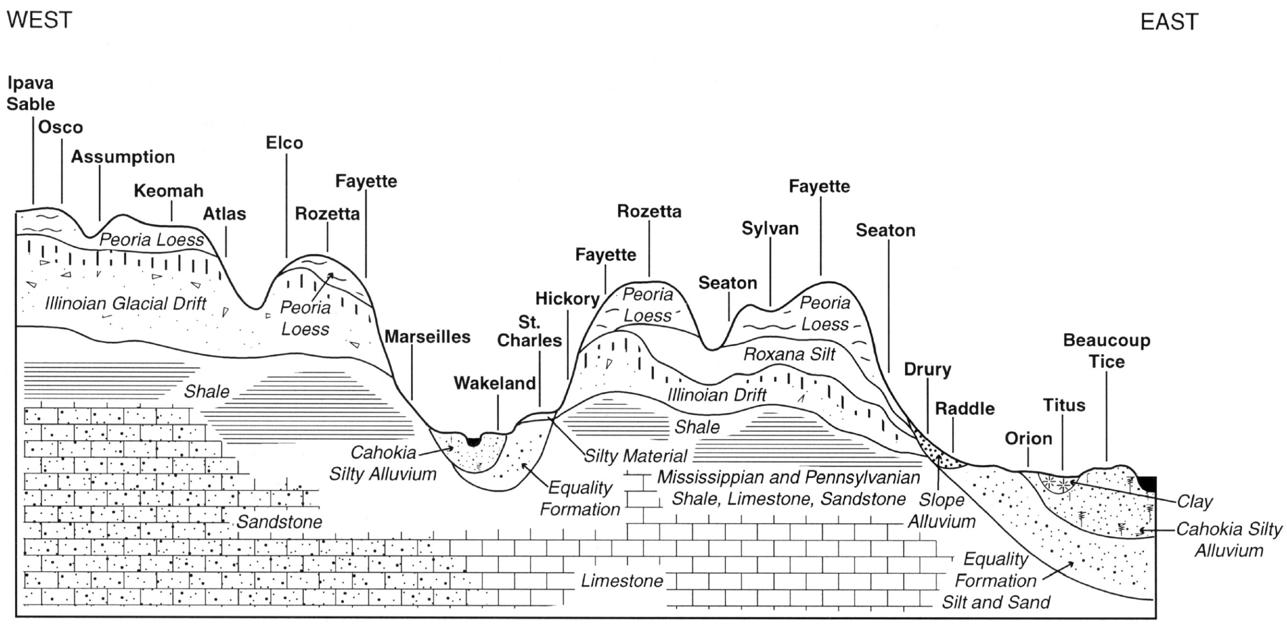

Figure 11.—A cross section showing the relationship of parent materials to the soils in Fulton County.

age. The soils that formed in outwash deposits are of minor extent in Fulton County. Dakota soils are examples.

Alluvium is material deposited by running water. There are two major types—stream alluvium and valley-side alluvium.

Stream alluvium is soil material deposited by floodwater along streams. The source of the alluvium generally is material eroded from other parent materials farther upstream in the watershed. Stream alluvium is poorly graded, stratified, and well sorted. The texture of the soil material varies, depending on the speed of the floodwater, the duration of the flooding, and the distance from the streambank. The faster moving water within the stream channel slows quickly once outside the channel as the concentrated channel flow changes to broad overland flow. As the water velocity decreases, the coarser textured material is deposited first near the channel. The fine textured material is carried a greater distance from the channel. Wakeland soils are examples of soils that formed close to the stream channel where the alluvium is coarser textured. Tice soils formed in finer textured alluvium farther from the stream channel. Areas that remain flooded for extensive periods of time with slowly moving water, such as backswamps, provide the environment for fine textured material to settle out. Titus soils are examples of soils that formed in these areas.

Valley-side alluvium is poorly graded and stratified, but it generally is not well sorted. The source of the alluvium generally is material eroded from parent material directly upslope. The soils that form in valley-side alluvium are similar in character to the upslope source. Raddle soils formed in valley-side alluvium.

Eolian sediments are materials transported and deposited by the wind. These sediments were derived from periglacial regions where sparse vegetation and low temperatures and precipitation rates left unconsolidated sediments exposed to wind action. The unconsolidated sediments, primarily outwash, were then stripped of their finer components by the strong wind. Eolian sediments were deposited during the Wisconsinan age. They are either loess or windblown sand. Loess is the major parent material in Fulton County. It is fine-grained and poorly graded and averages less than 7 percent sand. The loess in Fulton County is about 15 feet thick near the Illinois River bluffs and is less than 8 feet thick in the northwestern part of the county (Reinersten, 1988). Fayette and Osco soils formed in loess.

Windblown sand is poorly graded and is composed primarily of very fine sand and fine sand. It generally is in scattered areas on the eastern and southeastern sides of valleys along the Spoon River. The soils that formed in windblown sand are of minor extent in Fulton County. Chelsea soils are examples.

Bedrock residuum is material weathered from shale and sandstone. It is generally grayish and unstratified. The composition of the residuum is 25 to 42 percent clay and less than 25 percent sand and may include up to 15 percent fragments of weathered shale. The bedrock is Pennsylvanian in age. The soils that formed in bedrock residuum are of minor extent in Fulton County. Marseilles soils are examples.

Overburden from surface mining is the overlying material that was excavated to expose the coal seam. It consists of unconsolidated material, which includes the solum and substratum of the modern soil, and consolidated material, which includes shale or sandstone bedrock. The characteristics of the soils on surface-mined land reflect the overburden character, the method of mining, and the degree of reclamation. For example, the parent material of Lenzburg soils is a heterogeneous mixture of loess, till, and shale. This mixture is the result of a mining process in which little or no segregation of materials occurs. In some areas the unconsolidated material, consisting of a mixture of loess and till, is segregated during the mining process and placed directly over the cast rocky overburden. Lenzwheel soils formed in this material. In other areas the topsoil and the subsoil/substratum are segregated during the mining process and are either stockpiled for later distribution or directly redistributed on the graded rocky overburden. Rapatee soils formed in this reclaimed material.

Climate

The climate in Fulton County has significantly affected the soil-forming processes. The county currently has a humid, temperate climate. In this climatic environment, physical and chemical weathering of the parent material can occur along with the accumulation of organic matter, the decomposition of minerals, the formation and translocation of clay, the leaching of soluble compounds, and alternating periods of freezing and thawing.

The two climatic factors that have the greatest influence on soil-forming processes are precipitation and temperature. Precipitation supplies the moisture needed for most physical and chemical processes and determines the depth to which these processes occur. The soil moisture regime, which is only a partial function of precipitation, determines the processes that occur in the soil. The rate at which these physical and chemical processes proceed is dependent upon the temperature, particularly its relationship to the soil temperature regime.

Two soil moisture regimes occur in the county—aquic and udic. The aquic moisture regime is a reducing regime in a soil that is virtually free of dissolved oxygen because of saturation by water or by water of the capillary fringe. Biological activity is necessary to remove dissolved oxygen from ground water; therefore, the soil temperature must also be above biologic zero (5 degrees C) for some time while the soil is saturated. Titus soils have an aquic soil moisture regime. The udic moisture regime implies that the soil moisture control section is not dry in any part for as long as 90 cumulative days per year. Also required, except for short periods, is a three-phase system, solid-liquid-gas, in part or all of the soil moisture control section when the soil temperature is above biologic zero. Osco soils have a udic soil moisture regime.

The mesic soil temperature regime is the only temperature regime recognized in the county. This regime implies that the mean annual soil temperature is 8 degrees C or higher but is lower than 15 degrees C, and the difference between mean summer and mean winter soil temperatures is more than 5 degrees C at a depth of 20 inches.

Plants and Animals

The vegetation under which a soil forms influences several important soil properties, such as color, structure, reaction, and content and distribution of organic matter. Vegetation extracts water from the soil, recycles nutrients, and adds organic matter to the soil. Gases derived from root respiration combine with water to form acids that influence the weathering of minerals.

Several different types of vegetation have influenced the formation of the soils in Fulton County. These include prairie vegetation, upland hardwood forests, forest-prairie transition areas, and flood plain areas. These vegetation types are described in the following paragraphs.

Prairie Vegetation.—The decomposition of the roots of annual prairie grasses provides well distributed subsurface accumulations of organic materials, resulting in a thick, dark surface layer. Osco soils formed under prairie vegetation. The average content of organic matter in the surface layer of these soils is 3 to 4 percent.

Upland Hardwood Forests.—The primary organic matter contribution is from the annual additions of leaf litter to the surface layer, resulting in a thin, dark surface layer. Fayette soils formed under this type of vegetation. The average content of organic matter in the surface layer of these soils is 1 to 2 percent.

Forest-Prairie Transition Areas.—Soils that formed in these areas exhibit modified characteristics of both forest and prairie vegetative regimes. Clarksdale soils, which formed in these transition areas, have a thinner surface layer than the soils that formed under prairie vegetation. The average content of organic matter in the surface layer of the Clarksdale soils is 2 to 3 percent.

Flood Plain Areas.—Soils in these areas formed under a combination of trees and grasses. They have colors that largely reflect those of the sediments in which they formed. Tice and Wakeland soils are examples.

Bacteria, fungi, and many other micro-organisms decompose organic material and release nutrients to growing plants. They influence the formation of peds. Soil properties, such as drainage, temperature, and reaction, influence the type of micro-organisms that live in the soil. Fungi are generally more active in the more acid soils, and bacteria are more active in the less acid soils.

Earthworms, crayfish, insects, and small burrowing animals mix the soil and create small channels that influence soil aeration and the percolation of water. Earthworms help to incorporate crop residue or other organic material into the soil. The organic material improves soil tilth. In areas that are well populated with earthworms, the leaf litter that accumulates on the soil in the fall is generally incorporated into the soil by the following spring. If the earthworm population is low, part of the leaf litter can remain on the surface of the soil for several years.

Human activities have significantly influenced soil formation through their effect on soil health. Soil health has been damaged by degradation processes, such as erosion, compaction, contamination, disaggregation, loss of biological activity, and nutrient depletion. Native forests have been cleared and wet soils drained for farming and other uses. The development of land for urban uses or for surface mining has significantly influenced the soils in some areas.

Topography

Topography describes the configuration of the land surface in terms of relief and contour. It influences soil formation mainly through its effect on surface-water runoff or accumulation and on erosion or deposition. The degree of the effect of topography is dependent upon the type and stability of the land surface.

There are two types of land surfaces—aggrading and degrading—and three levels of stability—stable, metastable, and active. In Fulton County, aggrading surfaces receive material either from deposition associated with flooding or by the accumulation of erosional sediments. Wakeland soils formed on natural levees on flood plains, which are active-aggrading land surfaces. Natural levees receive depositions of sediment from frequent episodes of flooding. Raddle soils formed on footslopes that receive runoff with some accumulation of hillslope sediments. Footslopes are examples of metastable-aggrading land surfaces. Sable soils formed in broad, low-lying areas on drainage divides that receive runoff from upslope but accumulate little sediment from hillslope erosion. These broad, low-lying areas are examples of stable-aggrading land surfaces.

Degrading surfaces lose material primarily by the process of erosion. Keomah soils formed on the broad summits of interfluves. Broad summits are examples of stable-degrading surfaces, where runoff is limited. Fayette soils occur on shoulders of hillslopes and thus are more susceptible than the Keomah soils to runoff and erosion. Shoulders are metastable-degrading surfaces, where increased runoff leads to higher rates of erosion. Backslopes are examples of active-degrading surfaces. Seaton soils are on backslopes, where runoff and erosion rates are highest.

Time

The length of time that the parent material has been exposed to the soil-forming processes influences the degree of genetic horizon development that occurs within the soil. The evaluation of time as a factor in soil formation is difficult because of the effects of the other soil-forming factors. The influence of time can be modified by erosion, deposition of material, topography, and kind of parent material.

In some of the steeper areas, erosion removes the surface soil material as soon as the soil forms. Soils in these areas are immature even though the slopes have been exposed to weathering for thousands of years. Timula soils are examples. Soils on flood plains receive alluvial material during each flood. This repeated deposition interrupts soil formation. Wakeland soils are examples of soils that formed in stream alluvium.

Processes of Soil Formation

Soil forms through the complex interaction of four general processes. These processes are additions, transformations, removals, and transfers. The importance of these processes in the formation of a given soil varies.

The accumulation of organic matter in the A horizon of the mineral soils in Fulton County is an example of an addition. The most striking example of this addition is the formation of the mollic epipedon. The mollic epipedon forms in an environment that features optimum amounts of moisture, temperature, and bivalent cations. Such an environment allows grasses to thrive. The underground decomposition of organic residues and of organic residues from the surface that have been taken underground by animals results in the characteristic thickness and darkness of the mollic epipedon. Ipava soils are examples of soils that have a mollic epipedon.

Transformations are changes that take place in the soil. An example is the reduction of iron and manganese, which occurs in soils saturated with water. Typically, iron oxides coat soil particles and produce yellowish or reddish colors, and manganese oxides produce black colors. When a soil becomes saturated with water and the dissolved oxygen is removed, anaerobic conditions develop. These conditions result in changes in the biochemical processes occurring in the soils and in the development of distinctive soil morphological characteristics (redoximorphic features). Reduced iron and manganese can move with the soil water to other parts of the soil and can be removed entirely from the soil by leaching. After the iron and manganese are gone, the leached area, or depletion, generally has a grayish or whitish color. If the reduced iron comes in contact with oxygen, it can re-oxidize. The result is the formation of bright-colored concentrations or accumulations. Repeated cycles of saturation and drying create a mottled soil. Part of the soil is gray because of the loss of iron, and other parts are brown because the iron oxide has accumulated or has not been removed. The somewhat poorly drained Ipava soils are examples of soils in which this process has occurred. If a soil remains saturated for long periods, iron may be leached from the soil. Such soils are generally grayish, or gleyed. The poorly drained Titus soils are examples.

Removals that occur within the soil are commonly a result of leaching. The leaching of calcium carbonate from many of the soils in the county is an example of a removal. The parent material of these soils was initially high in calcium carbonate. Water percolating through the soil dissolved and transported the carbonate into the deeper soil layers. Calcium carbonate is relatively soluble and is removed relatively early in the formation of the soil. It is also a powerful flocculant, and its removal facilitates the translocation of clay and the formation of illuvial horizons. The loss of solid mineral and organic particles through erosion is another example of a removal. Such losses can be serious because the material lost is typically the most productive part of the soil profile.

Translocations are movements from one place to another in the soil. An example is the formation of an illuvial horizon through the translocation of clay from the A or E horizon, the zone of eluviation or loss, to the B horizon, the zone of illuviation or gain. In Fayette soils, for example, significant clay has accumulated, forming an illuvial horizon called an argillic horizon. The argillic horizon developed on a relatively old, stable landscape. Fine clay was transferred from the A or E horizon by water from rain and melting snow downward through the soil to the B horizon, where it was deposited on the faces of peds and along pores.

Soils and Soil-Landscape Units

Soils are natural bodies that are distributed on the landscape in a predictable way in response to a systematic interaction of the five major factors of soil formation; parent material, time, topography, plants and animals, and climate. The relationship of landscape to these five factors results in a soil-landscape unit (Hudson, 1992). A soil-landscape unit is similar to a landform that has been modified by one or more of the soil-forming factors. Within a particular soil-landscape unit, the same kind of soil should develop. Changes in the interaction of one or more of the five factors leads to a change in the soil-landscape unit, influencing the soil-forming processes and the soil that forms within this unit.

The following paragraphs describe the relationships and interactions that occur in some of the more common soil-landscape units in Fulton County and the soils that have formed in these units.

Upland landscapes predominate in Fulton County. These landscapes range from broad, relatively undissected drainage divides to dissected areas adjacent to the river bluffs. The parent material is loess. Much of the calcium carbonate present when the loess was deposited has been leached to a sufficient depth to facilitate soil development.

Low-lying areas on the broad drainage divides are stable-aggrading land surfaces that receive water through direct precipitation and runoff from upslope. These conditions result in a wet soil microclimate. A seasonal high water table is at or near the surface much of the year. and at times the area is ponded. Redoximorphic features associated with prolonged saturated conditions, such as a depleted soil matrix and iron and manganese accumulations along root channels and pores, occur at the soil surface as a result of the seasonal high water table.

The native vegetation in this soil-landscape unit was prairie grass. Additions of organic material from the decomposition of the extensive and deep root systems of these grasses resulted in a thick, dark surface layer called a mollic epipedon.

The saturated conditions and poor aeration influenced the rate of decomposition of organic material. This rate is slower in soils that are saturated for prolonged periods, resulting in a thicker mollic epipedon and a higher content of organic matter than in the soils in the better aerated positions upslope.

The extended periods of saturation also impeded the movement or illuviation of clay and the formation of an argillic horizon. A cambic horizon has developed through the aggregation of soil particles into structural units, or peds, and the development of redoximorphic features. Sable soils formed in these low-lying areas.

Upslope from the low-lying areas is a soil-landscape unit composed of the summits of broad rises on drainage divides. These areas are stable-degrading land surfaces that receive water primarily through direct precipitation. The seasonal high water table is at a lower depth than in the soils in the adjacent low-lying areas, and the associated redoximorphic features indicate a fluctuating water table. The soil microclimate alternates between periods when the soil is saturated and periods when the soil is unsaturated. The yellowish brown soil matrix in the upper part of the profile indicates an oxidizing environment; the redoximorphic features are associated with periods of saturation.

The native vegetation in areas of this soil-landscape unit was prairie grasses, but these landscape positions are better aerated than the low-lying positions and tend to have a higher rate of decomposition of organic matter. As a result, the soils in these areas generally have a slightly thinner mollic epipedon and a lower content of organic matter than the soils in the low-lying areas.

The fluctuating water table also disrupts the soil fabric through wetting and drying cycles, which aid in the dispersal of clay, the movement of clay with percolating water, and the precipitation of clay as films on ped surfaces and as linings of pores. The result is the formation of an illuvial horizon called an argillic horizon. Ipava soils formed in areas of this soil-landscape unit.

The soil-landscape unit in the more dissected areas is composed of broad summits of interfluves. It has characteristics similar to those of the unit on the summits of broad rises on drainage divides. These dissected areas are stable-degrading land surfaces that receive water primarily through direct precipitation. The depth to the seasonal high water table and the associated redoximorphic features are nearly identical to those of the soil-landscape unit on the summits of broad rises.

The native vegetation in this soil-landscape unit is transitional between forest and prairie vegetation. The soils in these areas have a dark surface layer, but they do not have a mollic epipedon because the dark surface layer is not thick enough and does not have a sufficient accumulation of organic matter. This type of surface horizon is called an ochric epipedon.

A light colored, eluvial subsurface horizon (called an albic horizon) has also developed in the soils in these areas. This horizon is typical of soils that formed under forest vegetation. In this horizon, much of the clay and free iron oxides has been removed and the color is determined primarily by the uncoated silt and sand particles. The clay translocated from the eluvial horizon to the illuvial horizon results in the formation of an argillic horizon. Clarksdale soils are in areas of this soil-landscape unit.

Adjacent to this soil-landscape unit is a unit that is also composed of summits of interfluves but that is generally closer to the opposing interfluve drainageways and on narrower summits. These areas are stable-degrading land surfaces that receive water through direct precipitation. Water that does not infiltrate the soil is lost through surface flow or runoff. Runoff increases the susceptibility to erosion.

The seasonal high water table and the associated redoximorphic features occur at a much lower depth than in the soils on the broad summits. The upper part of the soil profile is generally yellowish brown and free of the depletions that indicate an oxidizing environment. Depletions occurring in the lower part of the subsoil are generally restricted to the pores within the soil.

The native vegetation in areas of this soil-landscape unit is forest. Under forest vegetation, most of the addition of organic material occurs above ground. Organic matter is not incorporated as deep in the soil profile as it is in soils that formed under prairie vegetation, and the content decreases rapidly with increasing depth. Therefore, the dark surface layer in these soils is thinner than that in the Clarksdale soils. An ochric epipedon and an albic horizon have developed.

The more acid leaching environment that occurs under forest vegetation allows dispersed clay particles to be translocated to a greater depth than in similar positions under prairie vegetation. The result is a well developed argillic horizon. Rozetta soils formed in areas of this soil-landscape unit.

In rolling landscapes adjacent to the major rivers in the county is a soil-landscape unit composed of convex summits of narrow interfluves. These areas are metastable-degrading land surfaces that receive water through direct precipitation but also lose some of this water through runoff. Runoff increases the susceptibility to erosion and also creates a drier soil microclimate. The seasonal high water table is below the depth of the developing soil profile. The entire profile is yellowish brown or brown, indicating an oxidizing environment.

The native vegetation in this soil-landscape unit is forest. The soils have an ochric epipedon and albic and argillic horizons. Fayette soils are examples.

Downslope from this soil-landscape unit is a unit composed of backslopes of side slopes. These areas are active-degrading land surfaces that receive water through direct precipitation but also lose much of this water through runoff. The depth to the seasonal high water table is similar to that in the Fayette soils, and thus the soil profile is yellowish brown or brown and is free of depletions.

The native vegetation is forest. Like the Fayette soils, the soils in these areas have an ochric epipedon and albic and argillic horizons. Because much of the water is lost to runoff, however, less water infiltrates and percolates through the soil and less is available to aid in the translocation of clay. As a result, the argillic horizon is not as well developed as in the Fayette soils. Seaton soils formed in areas of this soil-landscape unit.

On the narrow flood plains between opposing side slopes is an active-aggrading land surface that receives depositions of sediment from frequent episodes of flooding. The nearly continual deposition of sediment interrupts the soil-forming processes. The result is a less developed soil profile. The soils in these areas have an ochric epipedon, but they also exhibit the fine stratification common to recent alluvial deposits and have no diagnostic subsurface horizons. Blyton soils are examples.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories. 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 4 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; 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 is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective ***Typic*** identifies the subgroup that typifies the great group. An example is Typic Hapludalfs.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineralogy class, cation-exchange activity class, soil temperature regime, soil depth, and reaction class. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-silty, mixed, superactive, mesic Typic Hapludalfs.

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

Soil Series and Detailed Soil Map Units

In this section, arranged in alphabetical order, each soil series recognized in the survey area is described. Each series description is followed by descriptions of the associated detailed soil map units.

Characteristics of the soil and the material in which it formed are identified for each soil 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). Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units 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. More information about each map unit is given in Part II of this survey.

A map unit delineation on the detailed soil maps represents an area on the landscape and consists of one or more soils 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 and miscellaneous areas are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor soils or areas that belong to other taxonomic classes.

Most map units include minor soils that have properties similar to those of the dominant soil or soils in the map unit and that generally do not affect use and management. These are called noncontrasting, or similar, soils. They may or may not be mentioned in the 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 areas of dissimilar components are mentioned in the map unit descriptions. A few of these areas may not have been observed, and consequently they are not mentioned in the descriptions, especially where the soil 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 segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but if intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit. The principal hazards and limitations to be considered in planning for specific uses are described in Part II of this survey.

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

Soils of one series can differ in texture of the surface layer or of the underlying layers. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into ***soil phases***. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Rozetta silt loam, 2 to 5 percent slopes, is a phase of the Rozetta series.

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

Table 5 gives the acreage and proportionate extent of each map unit. Other tables (see Contents in Part II) 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.

Ambraw Series

Taxonomic classification: Fine-loamy, mixed, superactive, mesic Fluvaquentic Endoaquolls

Typical Pedon

Ambraw clay loam, 0 to 2 percent slopes, occasionally flooded, 2,331 feet west and 832 feet north of the southeast corner of sec. 33, T. 5 N., R. 4 E.

Ap—0 to 6 inches; very dark grayish brown (10YR 3/2) clay loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; many very fine roots; moderately acid; abrupt smooth boundary.

A—6 to 16 inches; very dark gray (10YR 3/1) clay loam, gray (10YR 5/1) dry; moderate medium subangular blocky structure; firm; common very fine roots; few fine distinct dark yellowish brown (10YR 3/6) masses of iron accumulation with diffuse boundaries along pores; slightly acid; abrupt smooth boundary.

Bg1—16 to 22 inches; very dark gray (10YR 3/1) clay loam, gray (N 5/0) dry; moderate fine prismatic structure parting to moderate fine subangular blocky; firm; few very fine roots; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds and lining pores; common fine prominent dark yellowish brown (10YR 3/6) masses of iron accumulation with diffuse boundaries along pores; slightly acid; abrupt smooth boundary.

Bg2—22 to 33 inches; dark gray (N 4/0) clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few distinct very dark gray (10YR 3/1) organic coatings on faces of peds and lining pores; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation with diffuse boundaries along pores; very slightly effervescent; neutral; abrupt smooth boundary.

Bg3—33 to 41 inches; gray (5Y 5/1) sandy clay loam; moderate coarse subangular blocky structure; firm; very few distinct very dark gray (10YR 3/1) organic coatings on faces of peds and lining pores; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation with diffuse boundaries along pores; about 1 percent fine gravel; slightly effervescent; neutral; clear smooth boundary.

BCg—41 to 48 inches; dark gray (10YR 4/1) and gray (5Y 5/1), stratified sandy clay loam and sandy loam; weak coarse subangular blocky structure; firm; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation with diffuse boundaries along pores; slightly effervescent; neutral; clear smooth boundary.

Cg—48 to 70 inches; gray (5Y 5/1), light gray (N 6/0), and very dark gray (2.5Y 3/1), stratified sandy loam, sandy clay loam, and clay loam; massive; friable; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation with diffuse boundaries along pores; slightly effervescent; neutral.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches
Content of clay in the control section: 24 to 35 percent

Ap and A horizons:
Chroma—1 or 2

Bg horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—3 to 5
Chroma—0 or 1
Texture—clay loam or sandy clay loam

Cg horizon:
Hue—2.5Y, 5Y, or N
Value—3 to 6
Chroma—0 or 1
Texture—stratified sandy loam, sandy clay loam, or clay loam

8302A—Ambraw clay loam, 0 to 2 percent slopes, occasionally flooded

Setting

Landform: Flood plains
Position on the landform: Low-lying areas

Soil Properties and Qualities

Drainage class: Poorly drained
Parent material: Stream alluvium

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Ambraw and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
• Soils that have more clay and less sand throughout

Dissimilar components:
• Titus soils, which have more clay throughout than the Ambraw soil and are in lower positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Assumption Series

Taxonomic classification: Fine-silty, mixed, superactive, mesic Oxyaquic Argiudolls
Taxadjunct features: The Assumption soils in this survey area have a thinner dark surface layer than is defined as the range for the series. These soils are classified as fine-silty, mixed, superactive, mesic Mollic Hapludalfs.

Typical Pedon

Assumption silt loam, 5 to 10 percent slopes, eroded, 2,211 feet north and 264 feet east of the southwest corner of sec. 32, T. 8 N., R. 1 E.

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; common very fine roots; slightly acid; abrupt smooth boundary.

Bt1—8 to 14 inches; brown (10YR 4/3) silt loam; moderate very fine subangular blocky structure; friable; common very fine roots; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; neutral; clear smooth boundary.

Bt2—14 to 24 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine subangular blocky structure; friable; common very fine roots; common distinct dark brown (10YR 3/3) clay films on faces of peds; few fine distinct yellowish brown (10YR 5/4 and 5/6) masses of iron accumulation with diffuse boundaries in ped interiors; about 1 percent fine gravel; neutral; abrupt smooth boundary.

2Btg1—24 to 34 inches; dark grayish brown (10YR 4/2) silty clay loam; moderate medium subangular blocky structure; firm; common very fine roots; many distinct dark gray (10YR 4/1) clay films on faces of peds; common fine distinct dark yellowish brown (10YR 4/4) masses of iron accumulation with diffuse boundaries in ped interiors; about 15 percent sand and 1 percent fine gravel; neutral; clear smooth boundary.

2Btg2—34 to 49 inches; dark grayish brown (10YR 4/2) silty clay loam; strong medium prismatic structure; firm; common very fine roots; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine distinct dark yellowish brown (10YR 4/4) and common fine prominent reddish brown (5YR 4/4) masses of iron accumulation with diffuse boundaries in ped interiors; about 15 percent sand and 1 percent fine gravel; neutral; clear smooth boundary.

2Btg3—49 to 60 inches; grayish brown (10YR 5/2) silty clay loam; weak medium prismatic structure; firm; common very fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; many fine prominent yellowish red (5YR 5/6) masses of iron accumulation with diffuse boundaries in ped interiors; about 15 percent sand and 1 percent fine gravel; slightly acid.

Range in Characteristics

Thickness of the loess: 20 to 40 inches
Content of clay in the control section: 27 to 35 percent

Bt horizon:
Value—4 or 5
Chroma—3 or 4
Texture—silt loam or silty clay loam

259C2—Assumption silt loam, 5 to 10 percent slopes, eroded

Setting

Landform: Head slopes and side slopes along upland drainageways

Position on the landform: Shoulders

Soil Properties and Qualities

Drainage class: Moderately well drained
Parent material: Loess and the underlying paleosol, which formed in till

Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Assumption and similar soils: 90 percent
Dissimilar components: 10 percent

Similar soils:
- Soils that have a surface layer of silty clay loam
- Soils that have less sand in the lower part of the subsoil

Dissimilar components:
- The somewhat poorly drained Atlas soils in positions on the landform similar to those of the Assumption soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Atlas Series

Taxonomic classification: Fine, smectitic, mesic Aeric Chromic Vertic Epiaqualfs

Typical Pedon

Atlas silty clay loam, 10 to 18 percent slopes, severely eroded, 2,390 feet north and 1,780 feet east of the southwest corner of sec. 12, T. 7 N., R. 2 E.

Ap—0 to 4 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; moderate fine subangular blocky structure; firm; many very fine roots; neutral; abrupt smooth boundary.

Bt—4 to 8 inches; clay loam, 60 percent olive brown (2.5Y 4/4) and 40 percent brownish yellow (10YR 6/6); common fine subangular blocky structure; firm; many very fine roots; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds and lining pores; few fine prominent gray (5Y 5/1) iron depletions along root channels with boundaries of strong brown (7.5YR 5/8) masses of iron accumulation; neutral; clear smooth boundary.

2Btg1—8 to 19 inches; clay loam, 50 percent grayish brown (2.5Y 5/2), 30 percent olive brown (2.5Y 4/4), and 20 percent yellowish brown (10YR 5/6); moderate fine and medium subangular blocky structure; firm; common very fine roots; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds and lining pores; common fine prominent strong brown (7.5YR 5/8) masses of iron accumulation with sharp boundaries lining root channels; few fine prominent gray (5Y 5/1) iron depletions along root channels; neutral; gradual smooth boundary.

2Btg2—19 to 36 inches; clay loam, 60 percent grayish brown (2.5Y 5/2), 30 percent olive brown (2.5Y 4/4), and 10 percent yellowish brown (10YR 5/6); moderate medium subangular blocky structure; friable; few very fine roots; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds and lining pores; many medium prominent strong brown (7.5YR 5/8) masses of iron accumulation with sharp boundaries lining root channels; moderately alkaline; gradual smooth boundary.

2Btg3—36 to 66 inches; clay loam, 70 percent grayish brown (2.5Y 5/2), 20 percent olive brown (2.5Y 4/4), and 10 percent yellowish brown (10YR 5/6); moderate medium subangular blocky structure; firm; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds and lining pores; common fine prominent strong brown (7.5YR 5/8) masses of iron accumulation with diffuse boundaries lining root channels; few fine prominent gray (5Y 5/1) iron depletions along root channels; moderately alkaline; gradual smooth boundary.

2BCg—66 to 80 inches; loam, 80 percent grayish brown (2.5Y 5/2) and 20 percent light olive brown (2.5Y 5/6); weak medium subangular blocky structure; friable; few distinct dark grayish brown (10YR 4/2) clay films on faces of peds and lining pores; moderately alkaline.

Range in Characteristics

Thickness of the loess: 0 to 20 inches
Content of clay in the control section: 35 to 45 percent

Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 4

2Btg horizon:
Hue—7.5YR, 10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—0 to 4
Texture—clay loam or silty clay loam

7C3—Atlas silty clay loam, 5 to 10 percent slopes, severely eroded

Setting

Landform: Head slopes of upland drainageways
Position on the landform: Shoulders

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Parent material: Paleosol that formed in till

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Atlas and similar soils: 90 percent
Dissimilar components: 10 percent

Similar soils:
- Soils that have a surface layer of silt loam
- Soils that have less sand and clay in the upper part of the subsoil

Dissimilar components:
- The moderately well drained Rozetta soils, which are upslope from the Atlas soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

7D3—Atlas silty clay loam, 10 to 18 percent slopes, severely eroded

Setting

Landform: Head slopes and side slopes along upland drainageways
Position on the landform: Backslopes

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Parent material: Paleosol that formed in till

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Atlas and similar soils: 90 percent
Dissimilar components: 10 percent

Similar soils:
- Soils that have a surface layer of silt loam
- Soils that have less sand and clay in the upper part of the subsoil

Dissimilar components:
- The well drained Hickory soils in the more sloping positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Batavia Series

Taxonomic classification: Fine-silty, mixed, superactive, mesic Mollic Hapludalfs

Typical Pedon

Batavia silt loam, 2 to 5 percent slopes, eroded, 257 feet west and 1,089 feet north of the southeast corner of sec. 9, T. 8 N., R. 2 E.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine subangular blocky structure; friable; common very fine roots; slightly acid; abrupt smooth boundary.

Bt1—9 to 15 inches; brown (10YR 4/3) silty clay loam; moderate very fine subangular blocky structure; firm; few very fine roots; many distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds and lining pores; slightly acid; clear smooth boundary.

Bt2—15 to 27 inches; brown (10YR 4/3) silty clay loam; moderate fine subangular blocky structure;

firm; few very fine roots; common distinct dark brown (10YR 3/3) clay films on faces of peds and lining pores and few distinct very dark grayish brown (10YR 3/2) organo-clay films lining root channels and lining pores; strongly acid; clear smooth boundary.

Bt3—27 to 38 inches; silty clay loam, 80 percent dark yellowish brown (10YR 4/4) and 20 percent brown (10YR 5/3); moderate fine and medium subangular blocky structure; firm; few very fine roots; common distinct brown (10YR 4/3) clay films on faces of peds and lining pores; strongly acid; clear smooth boundary.

Bt4—38 to 46 inches; silty clay loam, 80 percent dark yellowish brown (10YR 4/4) and 20 percent brown (10YR 5/3); moderate medium subangular blocky structure; firm; few very fine roots; common distinct brown (10YR 4/3) clay films on faces of peds and lining pores; strongly acid; clear smooth boundary.

2Bt5—46 to 60 inches; clay loam and sandy loam, 60 percent dark yellowish brown (10YR 4/4), 30 percent brown (10YR 4/3), and 10 percent brown (10YR 5/3); weak medium subangular blocky structure; friable; few distinct brown (10YR 4/3) clay films lining root channels and lining pores; moderately acid; clear smooth boundary.

2Bt6—60 to 68 inches; dark yellowish brown (10YR 4/4) and brown (10YR 4/3) sandy loam and sandy clay loam; weak coarse subangular blocky structure; friable; few distinct brown (10YR 4/3) clay films lining root channels and lining pores; moderately acid; clear smooth boundary.

2C—68 to 72 inches; yellowish brown (10YR 5/4) sandy loam; massive; very friable; moderately acid.

Range in Characteristics

Thickness of the loess: 40 to 60 inches
Content of clay in the control section: 27 to 35 percent

Bt horizon:
Value—4 or 5
Chroma—3 or 4

2Bt horizon:
Value—4 or 5
Chroma—3 or 4
Texture—clay loam, sandy clay loam, or sandy loam

2C horizon:
Texture—sandy loam

105B2—Batavia silt loam, 2 to 5 percent slopes, eroded

Setting

Landform: Knolls on stream terraces
Position on the landform: Summits and shoulders

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Loess or other silty material and the underlying outwash

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Batavia and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
- Soils that have a dark surface layer more than 9 inches thick

Dissimilar components:
- The somewhat poorly drained Virgil soils in the less sloping positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Beaucoup Series

Taxonomic classification: Fine-silty, mixed, superactive, mesic Fluvaquentic Endoaquolls

Typical Pedon

Beaucoup silty clay loam, 0 to 2 percent slopes, occasionally flooded, 1,998 feet west and 2,491 feet north of the southeast corner of sec. 25, T. 4 N., R. 3 E.

Ap—0 to 8 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; weak very fine subangular blocky structure parting to weak fine

granular; friable; common very fine roots; neutral; clear smooth boundary.
A1—8 to 12 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; moderate fine subangular blocky structure; firm; few fine roots; few fine prominent dark yellowish brown (10YR 4/6) masses of iron accumulation with diffuse boundaries along pores and few fine black (10YR 2/1) manganese concretions with diffuse boundaries along pores and ped surfaces; neutral; clear smooth boundary.
A2—12 to 17 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; moderate fine subangular blocky structure; firm; few very fine roots; few fine prominent dark yellowish brown (10YR 4/6) masses of iron accumulation with diffuse boundaries along pores and few fine black (10YR 2/1) manganese concretions with diffuse boundaries along pores and ped surfaces; slightly alkaline; clear smooth boundary.
Bg1—17 to 28 inches; dark gray (10YR 4/1) silty clay loam; moderate fine and medium subangular blocky structure; firm; few very fine roots; common fine prominent dark yellowish brown (10YR 4/6) and common fine prominent strong brown (7.5YR 4/6) masses of iron accumulation with diffuse boundaries and few fine black (10YR 2/1) manganese concretions with diffuse boundaries along pores; slightly alkaline; clear smooth boundary.
Bg2—28 to 42 inches; dark gray (10YR 4/1) silty clay loam; moderate medium subangular blocky structure; firm; few very fine roots; common fine prominent dark yellowish brown (10YR 4/6) and common fine prominent strong brown (7.5YR 4/6) masses of iron accumulation with diffuse boundaries and few fine black (10YR 2/1) manganese concretions with diffuse boundaries along pores; neutral; clear smooth boundary.
Bg3—42 to 50 inches; gray (10YR 5/1) silty clay loam; moderate medium subangular blocky structure; firm; many fine prominent dark yellowish brown (10YR 4/6) and common fine prominent strong brown (7.5YR 4/6) masses of iron accumulation with diffuse boundaries and few fine black (10YR 2/1) manganese concretions with diffuse boundaries along pores; slightly alkaline; clear smooth boundary.
BCg—50 to 60 inches; silty clay loam, 60 percent gray (10YR 5/1) and 40 percent light gray (10YR 6/1); moderate coarse subangular blocky structure; firm; many fine distinct dark yellowish brown (10YR 4/6) masses of iron accumulation with diffuse boundaries and few fine black (10YR 2/1) manganese concretions with diffuse boundaries along pores; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches
Content of clay in the control section: 27 to 35 percent

Ap and A horizons:
Value—2 or 3

Bg horizon:
Hue—10YR, 2.5Y, or N
Value—4 or 5

3070A—Beaucoup silty clay loam, 0 to 2 percent slopes, frequently flooded

Setting

Landform: Flood plains
Position on the landform: Low-lying areas

Soil Properties and Qualities

Drainage class: Poorly drained
Parent material: Stream alluvium

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Beaucoup and similar soils: 90 percent
Dissimilar components: 10 percent

Similar soils:
- Soils that have more clay in the subsoil
- Soils that have a dark surface layer more than 24 inches thick

Dissimilar components:
- The somewhat poorly drained Orion soils in the slightly higher positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

8070A—Beaucoup silty clay loam, 0 to 2 percent slopes, occasionally flooded

Setting

Landform: Flood plains (fig. 12)
Position on the landform: Low-lying areas

Soil Properties and Qualities

Drainage class: Poorly drained
Parent material: Stream alluvium

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Beaucoup and similar soils: 90 percent
Dissimilar components: 10 percent

Similar soils:
- Soils that have a dark surface layer more than 24 inches thick
- Soils that have more clay in the subsoil

Dissimilar components:
- Titus soils, which have more clay in the subsoil than the Beaucoup soil and are in slightly lower positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Blyton Series

Taxonomic classification: Coarse-silty, mixed, superactive, nonacid, mesic Oxyaquic Udifluvents

Typical Pedon

Blyton silt loam, 0 to 2 percent slopes, frequently flooded, 1,520 feet east and 1,400 feet south of the northwest corner of sec. 3, T. 5 N., R. 3 E.

Ap—0 to 10 inches; dark grayish brown (10YR 4/2) silt loam, light gray (10YR 6/1) dry; weak fine granular structure; very friable; many very fine roots; neutral; abrupt smooth boundary.

C1—10 to 18 inches; silt loam, 60 percent brown (10YR 4/3) and 40 percent brown (10YR 5/3); massive with thin bedding planes; very friable; many very fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings lining root channels and pores; common fine distinct dark yellowish brown (10YR 4/6) masses of iron accumulation with diffuse boundaries throughout; neutral; abrupt smooth boundary.

C2—18 to 26 inches; brown (10YR 4/3) silt loam; massive with thin bedding planes; very friable; common very fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings lining root channels and pores; common fine distinct dark yellowish brown (10YR 4/6) masses of iron accumulation with diffuse boundaries throughout; common fine faint grayish brown (10YR 5/2) iron depletions along pores; neutral; clear smooth boundary.

C3—26 to 80 inches; brown (10YR 4/3) silt loam; massive with thin bedding planes; common fine distinct dark yellowish brown (10YR 4/4) masses of iron accumulation with diffuse boundaries throughout; common fine faint grayish brown (10YR 5/2) and light brownish gray (10YR 6/2) iron depletions along pores; very friable; neutral.

Range in Characteristics

C horizon:
Value—4 or 5

3634A—Blyton silt loam, 0 to 2 percent slopes, frequently flooded

Setting

Landform: Rises on flood plains
Position on the landform: Summits

Soil Properties and Qualities

Drainage class: Moderately well drained
Parent material: Stream alluvium

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Blyton and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
- Soils that have gray colors at a depth of less than 24 inches

Figure 12.—An area of Beaucoup silty clay loam, 0 to 2 percent slopes, occasionally flooded, protected from flooding by a system of levees along the Illinois River.

- Soils that have a buried dark surface layer at a depth of 20 inches or more

Dissimilar components:
- The poorly drained Sawmill soils in the lower positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Breeds Series

Taxonomic classification: Fine-silty, mixed, superactive, mesic Aquic Hapludolls

Typical Pedon

Breeds silty clay loam, 0 to 2 percent slopes, 765 feet east and 199 feet south of the northwest corner of sec. 14, T. 6 N., R. 5 E.

Ap—0 to 9 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; weak fine granular structure; friable; few fine and common very fine roots; strongly acid; clear smooth boundary.

A—9 to 16 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine subangular blocky structure; friable; few very fine roots; moderately acid; clear smooth boundary.

BA—16 to 19 inches; brown (10YR 4/3) silty clay loam; moderate fine subangular blocky structure; firm; few very fine roots; many distinct black (10YR 2/1) organic coatings on faces of peds; few fine prominent brown (7.5YR 4/4) masses of iron accumulation with diffuse boundaries lining pores and root channels; slightly acid; clear smooth boundary.

Bt—19 to 23 inches; silty clay loam, 70 percent brown (10YR 4/3) and 30 percent brown (10YR 5/3); moderate medium subangular blocky structure; firm; few very fine roots; common distinct black (10YR 2/1) organic coatings on faces of peds and common distinct dark grayish brown (10YR 4/2) clay films on faces of peds and lining pores; few fine distinct yellowish brown (10YR 5/8) and few fine prominent brown (7.5YR 4/4) masses of iron accumulation and few fine black (10YR 2/1) masses of manganese accumulation with diffuse boundaries lining root channels and pores; slightly acid; clear smooth boundary.

Btg1—23 to 32 inches; silty clay loam, 80 percent grayish brown (2.5Y 5/2) and 20 percent light brownish gray (2.5Y 6/2); moderate medium subangular blocky structure; firm; few very fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds and lining pores; common fine prominent yellowish brown (10YR 5/8) and few fine prominent strong brown (7.5YR 4/6) masses of iron accumulation and few fine black (10YR 2/1) masses of manganese accumulation with diffuse boundaries lining pores; neutral; clear smooth boundary.

Btg2—32 to 40 inches; light brownish gray (2.5Y 6/2) silty clay loam; moderate coarse subangular blocky structure; firm; few very fine roots; few distinct dark grayish brown (10YR 4/2) clay films on vertical faces of peds and lining pores; common fine prominent yellowish brown (10YR 5/8) and few fine prominent strong brown (7.5YR 4/6) masses of iron accumulation and few fine black (10YR 2/1) masses of manganese accumulation with diffuse boundaries lining root channels and pores; neutral; clear smooth boundary.

2BCt—40 to 46 inches; light olive brown (2.5Y 5/4), stratified clay loam and sandy clay loam; weak coarse subangular blocky structure; firm; few distinct dark grayish brown (10YR 4/2) clay films lining pores; many fine prominent yellowish brown (10YR 5/8) masses of iron accumulation with diffuse boundaries lining pores; about 10 percent fine and medium gravel and 2 percent coarse gravel and shale channers; neutral; abrupt smooth boundary.

3Cr—46 to 60 inches; weathered shale bedrock.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Content of clay in the control section: 27 to 35 percent
Depth to a paralithic contact in shale: 40 to 60 inches

Bt horizon:
Value—4 or 5

Btg horizon:
Value—5 or 6

558A—Breeds silty clay loam, 0 to 2 percent slopes

Setting

Landform: Ridges on strath terraces
Position on the landform: Summits

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Parent material: Loess or other silty material and the underlying outwash

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Breeds soil: 90 percent
Dissimilar components: 10 percent

Dissimilar components:
- The poorly drained Copperas soils in low-lying areas
- The well drained Raddle and Worthen soils in the more sloping positions upslope from the Breeds soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Camden Series

Taxonomic classification: Fine-silty, mixed, superactive, mesic Typic Hapludalfs

Typical Pedon

Camden silt loam, 5 to 10 percent slopes, eroded, 200 feet east and 1,210 feet south of the northwest corner of sec. 19, T. 7 N., R. 2 E.

Ap—0 to 8 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine granular structure; friable; many very fine roots; moderately acid; abrupt smooth boundary.

Bt1—8 to 22 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine subangular blocky structure; firm; common very fine roots; many distinct brown (10YR 4/3) clay films on faces of peds and lining root channels and few distinct light gray (10YR 7/2 dry) silt coatings on faces of peds; moderately acid; clear smooth boundary.

Bt2—22 to 31 inches; brown (7.5YR 4/4) silty clay loam; moderate medium subangular blocky structure; firm; few very fine roots; many distinct brown (10YR 4/3) clay films on faces of peds and lining pores and root channels and few distinct light gray (10YR 7/2 dry) silt coatings on faces of peds; moderately acid; clear smooth boundary.

2Bt3—31 to 39 inches; brown (7.5YR 4/4) sandy clay loam; weak medium and coarse subangular blocky structure; friable; few distinct brown (10YR 4/3) clay films on faces of peds and lining pores; about 8 percent fine and medium gravel; slightly acid; clear smooth boundary.

2BC—39 to 50 inches; brown (7.5YR 4/4) coarse sandy loam; weak coarse subangular blocky structure; friable; about 6 percent fine gravel; moderately acid; clear smooth boundary.

2C—50 to 80 inches; brown (7.5YR 4/4), stratified coarse sandy loam, sand, and sandy clay loam; massive; friable; about 2 percent fine gravel; slightly acid.

Range in Characteristics

Thickness of the loess: 24 to 40 inches

Ap horizon:
Value—3 or 4

Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—4 to 6

2Bt horizon:
Hue—7.5YR or 10YR
Chroma—4 to 6
Texture—clay loam or sandy clay loam

2C horizon:
Value—4 to 6
Chroma—3 to 6

134C2—Camden silt loam, 5 to 10 percent slopes, eroded

Setting

Landform: Side slopes along drainageways on stream terraces
Position on the landform: Shoulders

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Loess or other silty material and the underlying outwash

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Camden and similar soils: 90 percent
Dissimilar components: 10 percent

Similar soils:
- Soils that have less sand in the upper part of the subsoil
- Soils that have a surface layer of silty clay loam

Dissimilar components:
- The well drained Chelsea soils, which have more fine sand throughout the solum than the Camden soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

134D2—Camden silt loam, 10 to 18 percent slopes, eroded

Setting

Landform: Side slopes along drainageways on stream terraces and in the uplands
Position on the landform: Shoulders

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Loess or other silty material and the underlying outwash

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Camden and similar soils: 90 percent
Dissimilar components: 10 percent

Similar soils:
- Soils that have a surface layer of silty clay loam
- Soils that have more sand in the lower part of the subsoil

Dissimilar components:
- The well drained Chelsea soils, which have more fine sand throughout the solum than the Camden soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

134E2—Camden silt loam, 18 to 25 percent slopes, eroded

Setting

Landform: Side slopes along upland drainageways
Position on the landform: Backslopes

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Loess or other silty material and the underlying outwash

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Camden and similar soils: 90 percent
Dissimilar components: 10 percent

Similar soils:
- Soils that have a surface layer of silty clay loam
- Soils that have more sand in the lower part of the subsoil
- Soils that have slopes of more than 25 percent

Dissimilar components:
- The well drained Chelsea soils, which have more fine sand throughout the solum than the Camden soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Chelsea Series

Taxonomic classification: Mixed, mesic Lamellic Udipsamments

Typical Pedon

Chelsea loamy fine sand, 7 to 20 percent slopes, 1,622 feet east and 2,310 feet south of the northwest corner of sec. 13, T. 7 N., R. 1 E.

Ap—0 to 5 inches; very dark grayish brown (10YR 3/2) loamy fine sand, grayish brown (10YR 5/2) dry; weak fine granular structure; very friable; many very fine roots; strongly acid; abrupt smooth boundary.

A—5 to 13 inches; brown (10YR 4/3) loamy fine sand; weak fine subangular blocky structure; very friable; many very fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds and lining pores; slightly acid; abrupt smooth boundary.

E1—13 to 26 inches; dark yellowish brown (10YR 4/6) loamy fine sand; single grain; loose; common very fine roots; moderately acid; abrupt smooth boundary.

E2—26 to 32 inches; dark yellowish brown (10YR 4/6) loamy fine sand; single grain; loose; few very fine roots; moderately acid; clear smooth boundary.

E&Bt—32 to 60 inches; dark yellowish brown (10YR 4/6) loamy fine sand (E); single grain; loose; lamellae of brown (10YR 4/3) sandy loam 1/2 inch to 2 inches thick (Bt); weak fine subangular blocky structure; very friable; few very fine roots; slightly acid.

Range in Characteristics

Depth to lamellae: 27 to 46 inches

Ap horizon:
Value—3 or 4
Chroma—2 to 4

E horizon:
Value—4 to 6
Texture—loamy fine sand or fine sand

Bt part of E&Bt horizon:
Chroma—3 or 4
Texture—loamy fine sand or sandy loam

779B—Chelsea loamy fine sand, 1 to 7 percent slopes

Setting

Landform: Ridges on stream terraces and in the uplands
Position on the landform: Summits

Soil Properties and Qualities

Drainage class: Excessively drained
Parent material: Eolian deposits

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Chelsea and similar soils: 85 percent
Dissimilar components: 15 percent

Similar soils:
- Soils that have less sand in the surface layer
- Soil that have more clay in the subsoil

Dissimilar components:
- The well drained Rozetta soils in positions on the landform similar to those of the Chelsea soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

779D—Chelsea loamy fine sand, 7 to 20 percent slopes

Setting

Landform: Ridges on stream terraces and in the uplands
Position on the landform: Shoulders and backslopes

Soil Properties and Qualities

Drainage class: Excessively drained
Parent material: Eolian deposits

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Chelsea and similar soils: 85 percent
Dissimilar components: 15 percent

Similar soils:
- Soils that have more clay in the subsoil

Dissimilar components:
- The well drained Hickory soils in positions on the landform similar to those of the Chelsea soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Clarksdale Series

Taxonomic classification: Fine, smectitic, mesic Udollic Endoaqualfs

Typical Pedon

Clarksdale silt loam, 0 to 2 percent slopes, 2,376 feet south and 2,531 feet east of the northwest corner of sec. 14, T. 4 N., R. 2 E.

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; few very fine roots; moderately acid; clear smooth boundary.
E1—7 to 10 inches; dark grayish brown (10YR 4/2) silt loam; weak medium platy structure; friable; few

very fine roots; many distinct very dark grayish brown (10YR 3/2) organic coatings and few distinct light gray (10YR 7/2 dry) silt coatings on faces of peds; moderately acid; clear smooth boundary.

E2—10 to 13 inches; dark grayish brown (10YR 4/2) silt loam; moderate very fine subangular blocky structure; friable; few very fine and few medium roots; few distinct very dark grayish brown (10YR 3/2) organic coatings and common distinct light gray (10YR 7/2 dry) silt coatings on faces of peds; few fine distinct dark yellowish brown (10YR 4/6) and yellowish brown (10YR 5/6) masses of iron accumulation with diffuse boundaries in ped interiors; moderately acid; clear smooth boundary.

Bt1—13 to 20 inches; brown (10YR 4/3) silty clay loam; moderate fine and medium subangular blocky structure; friable; few very fine roots; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds and lining pores; common fine distinct dark yellowish brown (10YR 4/6) and yellowish brown (10YR 5/6) masses of iron accumulation with diffuse boundaries in ped interiors; moderately acid; gradual smooth boundary.

Bt2—20 to 24 inches; brown (10YR 5/3) silty clay loam; weak medium prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds and lining pores and few distinct very dark gray (10YR 3/1) organo-clay films lining root channels and pores; common fine distinct dark yellowish brown (10YR 4/6) and yellowish brown (10YR 5/6) masses of iron accumulation and few fine black (10YR 2/1) manganese concretions with diffuse boundaries in ped interiors; few fine distinct light brownish gray (10YR 6/2) iron depletions along root channels and pores; moderately acid; gradual smooth boundary.

Btg—24 to 31 inches; light brownish gray (2.5Y 6/2) silty clay loam; weak medium prismatic structure parting to moderate medium and coarse subangular blocky; friable; few very fine roots; common distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds and lining pores and few distinct very dark gray (10YR 3/1) organo-clay films lining root channels and pores; common fine and medium distinct dark yellowish brown (10YR 4/6) and yellowish brown (10YR 5/6) masses of iron accumulation and few fine black (10YR 2/1) manganese concretions with diffuse boundaries along root channels and pores; moderately acid; gradual smooth boundary.

BCtg—31 to 42 inches; light brownish gray (2.5Y 6/2) silty clay loam; weak coarse subangular blocky structure; friable; few very fine roots; few distinct very dark gray (10YR 3/1) organo-clay films lining root channels and pores; common medium prominent yellowish brown (10YR 5/6) and common fine and medium prominent dark yellowish brown (10YR 4/6) masses of iron accumulation and few fine black (10YR 2/1) manganese concretions with diffuse boundaries along root channels and pores; slightly acid; gradual smooth boundary.

Cg—42 to 60 inches; light brownish gray (2.5Y 6/2) silt loam; massive; friable; few very fine roots; few distinct very dark gray (10YR 3/1) organo-clay films lining root channels and pores; common fine and medium distinct dark yellowish brown (10YR 4/6) masses of iron accumulation and few fine black (10YR 2/1) manganese concretions with diffuse boundaries in ped interiors; neutral.

Range in Characteristics

Content of clay in the control section: 35 to 42 percent

Ap horizon:
Value—2 or 3
Chroma—1 or 2

E horizon:
Value—4 to 6
Chroma—1 or 2

Bt horizon:
Value—4 to 6
Chroma—2 to 6

Btg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 6

C horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 6

257A—Clarksdale silt loam, 0 to 2 percent slopes

Setting

Landform: Interfluves
Position on the landform: Broad summits

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Parent material: Loess

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Clarksdale and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
- Soils that have a lighter colored surface layer
- Soils that have a thicker dark surface layer

Dissimilar components:
- The poorly drained Rushville soils in depressions

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

9257A—Clarksdale silt loam, terrace, 0 to 2 percent slopes

Setting

Landform: Stream terraces
Position on the landform: Broad summits

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Parent material: Loess or other silty material

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Clarksdale and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
- Soils that have a lighter colored surface layer
- Soils that have a dark surface layer more than 9 inches thick

Dissimilar components:
- The poorly drained Sable soils in low-lying positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Coot Series

Taxonomic classification: Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Aquic Argiudolls

Typical Pedon

Coot loam, 0 to 2 percent slopes, occasionally flooded, 1,998 feet east and 1,132 feet south of the northwest corner of sec. 34, T. 6 N., R. 5 E.

Ap—0 to 10 inches; very dark gray (10YR 3/1) loam, dark gray (10YR 4/1) dry; weak fine granular structure; friable; common very fine roots; neutral; clear smooth boundary.

A—10 to 15 inches; very dark gray (10YR 3/1) loam, dark gray (10YR 4/1) dry; weak fine and medium granular structure; friable; few very fine roots; neutral; clear smooth boundary.

Bt1—15 to 19 inches; dark grayish brown (10YR 4/2) clay loam; weak fine subangular blocky structure; firm; few very fine roots; many distinct very dark gray (10YR 3/1) organo-clay films on faces of peds and lining pores; few fine distinct dark yellowish brown (10YR 4/4) masses of iron accumulation with diffuse boundaries lining pores and root channels; neutral; clear smooth boundary.

Bt2—19 to 22 inches; dark grayish brown (10YR 4/2) clay loam; moderate medium subangular blocky structure; firm; few very fine roots; common distinct very dark gray (10YR 3/1) organo-clay films on faces of peds and lining pores; common fine distinct dark yellowish brown (10YR 4/6) masses of iron accumulation with diffuse boundaries lining pores and root channels; about 5 percent fine pebbles; neutral; clear smooth boundary.

2Bt3—22 to 27 inches; dark grayish brown (10YR 4/2) gravelly clay loam; moderate medium subangular blocky structure; firm; few distinct very dark gray

(10YR 3/1) organo-clay films on faces of peds and lining pores; common medium distinct dark yellowish brown (10YR 4/6) and yellowish brown (10YR 5/8) masses of iron accumulation with diffuse boundaries lining pores and root channels; about 15 percent fine and medium pebbles and less than 1 percent coarse pebbles; neutral; clear smooth boundary.

2Bt4—27 to 32 inches; dark grayish brown (10YR 4/2) gravelly clay loam; moderate medium subangular blocky structure; firm; few distinct very dark gray (10YR 3/1) organo-clay films lining root channels and pores; common medium distinct dark yellowish brown (10YR 4/6) and yellowish brown (10YR 5/8) masses of iron accumulation with diffuse boundaries lining ped surfaces and pores; about 20 percent fine and medium pebbles and 1 percent coarse pebbles; slightly alkaline; clear smooth boundary.

2C—32 to 41 inches; brown (10YR 5/3) and yellowish brown (10YR 5/4) gravelly loamy coarse sand; single grain; loose; about 30 percent fine and medium pebbles and 3 percent coarse pebbles; slightly effervescent; slightly alkaline; abrupt smooth boundary.

3Cr—41 to 60 inches; clay shale, 60 percent light gray (N 6/0) and light brownish gray (2.5Y 6/2) and 40 percent light olive brown (2.5Y 5/4); massive with horizontal cleavage planes; very firm; violently effervescent; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Content of clay in the control section: 25 to 35 percent
Depth to a paralithic contact in shale: 40 to 60 inches

2C horizon:
Chroma—3 or 4

3Cr horizon:
Hue—2.5Y or N
Value—5 or 6
Chroma—0 to 4

8595A—Coot loam, 0 to 2 percent slopes, occasionally flooded

Setting

Landform: Rises on strath terraces
Position on the landform: Summits

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Parent material: Outwash

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Coot and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
- Soils that have more rock fragments in the surface layer

Dissimilar components:
- Soils that have bedrock at a depth of less than 40 inches
- The poorly drained Mudhen soils in the lower positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Copperas Series

Taxonomic classification: Fine-silty, mixed, superactive, mesic Fluvaquentic Endoaquolls

Typical Pedon

Copperas silty clay loam, 0 to 2 percent slopes, 432 feet west and 832 feet south of the northeast corner of sec. 15, T. 6 N., R. 6 E.

Ap—0 to 8 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; weak fine granular structure; friable; few very fine roots; neutral; clear smooth boundary.

A—8 to 16 inches; very dark gray (N 3/0) silty clay loam, gray (10YR 5/1) dry; moderate fine subangular blocky structure; friable; few very fine roots; few fine prominent brown (7.5YR 4/4) masses of iron accumulation with diffuse boundaries lining pores and root channels; neutral; clear smooth boundary.

Btg1—16 to 23 inches; olive gray (5Y 4/2) silty clay loam; moderate fine and medium subangular blocky structure; firm; few very fine roots; few distinct very dark gray (N 3/0) organo-clay films and dark gray (5Y 4/1) clay films on vertical faces of peds and lining pores; few fine prominent brown

(7.5YR 4/4) and few fine prominent yellowish brown (10YR 5/8) masses of iron accumulation and few fine black (10YR 2/1) masses of manganese accumulation with diffuse boundaries lining root channels and pores; about 1 percent fine gravel; neutral; clear smooth boundary.

Btg2—23 to 31 inches; olive gray (5Y 4/2) silty clay loam; moderate medium subangular blocky structure; firm; few very fine roots; few distinct very dark gray (N 3/0) organo-clay films and dark gray (5Y 4/1) clay films on vertical faces of peds and lining pores; few fine prominent brown (7.5YR 4/4) and common fine prominent yellowish brown (10YR 5/8) masses of iron accumulation and few fine black (10YR 2/1) masses of manganese accumulation with diffuse boundaries lining root channels and pores; about 2 percent fine gravel; slightly alkaline; clear smooth boundary.

Btg3—31 to 38 inches; olive gray (5Y 4/2) silty clay loam; moderate medium subangular blocky structure; firm; very few distinct dark gray (5Y 4/1) clay films on vertical faces of peds and lining pores; common fine prominent yellowish brown (10YR 5/8) masses of iron accumulation and few medium black (10YR 2/1) masses of manganese accumulation with diffuse boundaries lining pores; about 5 percent fine gravel and 2 percent medium gravel; slightly alkaline; clear smooth boundary.

Btg4—38 to 45 inches; olive gray (5Y 5/2) silty clay loam; weak coarse subangular blocky structure; firm; very few distinct dark gray (5Y 4/1) clay films lining pores; many fine prominent yellowish brown (10YR 5/8) masses of iron accumulation and few fine black (10YR 2/1) masses of manganese accumulation with diffuse boundaries lining pores; about 5 percent fine gravel and 2 percent medium gravel; slightly alkaline; clear smooth boundary.

Cg—45 to 55 inches; 80 percent olive gray (5Y 5/2) and 20 percent light olive gray (5Y 6/2) silty clay loam; massive; firm; many fine prominent yellowish brown (10YR 5/8) masses of iron accumulation and few fine black (10YR 2/1) masses of manganese accumulation with diffuse boundaries lining pores; about 3 percent fine gravel and shale channers; slightly alkaline; abrupt smooth boundary.

2Cr—55 to 60 inches; fractured shale bedrock.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Content of clay in the control section: 27 to 35 percent
Depth to a paralithic contact in shale: 40 to 60 inches

Ap and A horizons:
Hue—10YR, 2.5Y, or N
Chroma—0 or 1

Btg horizon:
Value—4 to 6

632A—Copperas silty clay loam, 0 to 2 percent slopes

Setting

Landform: Strath terraces
Position on the landform: Low-lying areas

Soil Properties and Qualities

Drainage class: Poorly drained
Parent material: Stream alluvium

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Copperas and similar soils: 90 percent
Dissimilar components: 10 percent

Similar soils:
- Soils that have bedrock within a depth of 60 inches
- Soils that have a dark surface layer more than 24 inches thick

Dissimilar components:
- Titus soils, which have more clay throughout than the Copperas soil and are in lower positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Dakota Series

Taxonomic classification: Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Typic Argiudolls

Typical Pedon

Dakota loam, 2 to 5 percent slopes, 1,498 feet west and 2,331 feet south of the northeast corner of sec. 27, T. 6 N., R. 5 E.

Ap—0 to 9 inches; very dark grayish brown (10YR

3/2) loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; common very fine roots; slightly acid; clear smooth boundary.

A—9 to 16 inches; dark brown (10YR 3/3) loam, brown (10YR 5/3) dry; weak fine granular structure; friable; few very fine roots; many distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds and lining pores; slightly acid; clear smooth boundary.

Bt1—16 to 22 inches; brown (10YR 4/3) clay loam; moderate very fine subangular blocky structure; firm; few very fine roots; many distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds and lining pores; moderately acid; clear smooth boundary.

2Bt2—22 to 33 inches; gravelly clay loam, 70 percent brown (10YR 4/3) and 30 percent dark yellowish brown (10YR 4/4); moderate medium subangular blocky structure; firm; few very fine roots; few distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; about 15 percent fine and medium gravel and 1 percent coarse gravel; moderately acid; clear smooth boundary.

2C1—33 to 48 inches; brown (7.5YR 4/4) gravelly loamy sand; massive; very friable; about 30 percent fine and medium gravel and 3 percent coarse gravel; slightly acid; clear smooth boundary.

2C2—48 to 80 inches; brown (10YR 5/3) sand and gravel; single grain; loose; about 40 percent gravel; slightly acid.

Range in Characteristics

Depth to gravelly textures: 20 to 40 inches

Ap and A horizons:
Hue—10YR or 7.5YR
Value—2 or 3
Chroma—1 to 3
Texture—fine sandy loam, sandy loam, loam, or silt loam

Bt horizon:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—3 to 5
Texture—loam, sandy clay loam, or clay loam

2Bt horizon:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—3 to 5
Texture—clay loam, sandy loam, coarse sandy loam, loamy sand, loamy coarse sand, sand, or coarse sand or the gravelly analogs of these textures

2C horizon:
Hue—10YR or 7.5YR
Value—4 to 7
Chroma—2 to 6
Texture—sand, coarse sand, or loamy sand (stratified with gravel)

379A—Dakota loam, 0 to 2 percent slopes

Setting

Landform: Rises on stream terraces
Position on the landform: Summits

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Outwash

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Dakota and similar soils: 90 percent
Dissimilar components: 10 percent

Similar soils:
- Soils that have more sand and gravel in the lower part of the subsoil and in the substratum

Dissimilar components:
- Soils that are shallow over bedrock

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

379B—Dakota loam, 2 to 5 percent slopes

Setting

Landform: Ridges on stream terraces
Position on the landform: Summits

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Outwash

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Dakota and similar soils: 90 percent
Dissimilar components: 10 percent

Similar soils:
- Soils that have more sand and gravel in the lower part of the subsoil and in the substratum
- Soils that have slopes of more than 5 percent

Dissimilar components:
- Soils that are shallow over bedrock

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Denny Series

Taxonomic classification: Fine, smectitic, mesic Mollic Albaqualfs

Typical Pedon

Denny silt loam, 0 to 2 percent slopes, 460 feet north and 480 feet east of the southwest corner of sec. 22, T. 8 N., R. 1 E.

Ap—0 to 9 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; weak fine granular structure; friable; many very fine and fine roots; neutral; abrupt smooth boundary.

Eg—9 to 22 inches; grayish brown (10YR 5/2) silt loam; moderate medium platy structure; friable; common very fine and fine roots; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation with diffuse boundaries and few fine black (10YR 2/1) manganese concretions with diffuse boundaries along root channels; slightly acid; abrupt smooth boundary.

Btg1—22 to 28 inches; silty clay loam, 90 percent grayish brown (2.5Y 5/2) and 10 percent light gray (10YR 6/1); weak fine prismatic structure parting to moderate medium subangular blocky; firm; few very fine and fine roots; few distinct brown (10YR 4/3) clay films on faces of peds; few fine distinct yellowish brown (10YR 5/8) masses of iron accumulation and few fine black (10YR 2/1) manganese concretions with diffuse boundaries along root channels and pores; slightly acid; clear smooth boundary.

Btg2—28 to 36 inches; silty clay loam, 80 percent grayish brown (2.5Y 5/2) and 20 percent light gray (10YR 6/1); moderate fine prismatic structure parting to moderate medium subangular blocky; firm; common distinct brown (10YR 4/3) clay films on faces of peds; few fine distinct yellowish brown (10YR 5/8) masses of iron accumulation and few fine black (10YR 2/1) manganese concretions with diffuse boundaries along root channels and pores; slightly acid; clear smooth boundary.

Btg3—36 to 45 inches; light brownish gray (2.5Y 6/2) silty clay loam; weak medium subangular blocky structure; firm; few distinct brown (10YR 4/3) clay films on faces of peds; few fine distinct yellowish brown (10YR 5/8) masses of iron accumulation and few fine black (10YR 2/1) manganese concretions with diffuse boundaries along root channels and pores; slightly acid; clear smooth boundary.

Cg—45 to 70 inches; light brownish gray (2.5Y 6/2) silty clay loam; massive; firm; few fine distinct yellowish brown (10YR 5/8) masses of iron accumulation and few fine black (10YR 2/1) manganese concretions with diffuse boundaries along pores; slightly acid.

Range in Characteristics

Content of clay in the control section: 35 to 45 percent

Btg horizon:
Hue—10YR or 2.5Y
Value—5 or 6
Chroma—1 or 2

45A—Denny silt loam, 0 to 2 percent slopes

Setting

Landform: Upland drainage divides
Position on the landform: Depressions

Soil Properties and Qualities

Drainage class: Poorly drained
Parent material: Loess

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Denny and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
- Soils that have a dark surface layer more than 9 inches thick
- Soils that have a lighter colored surface layer

Dissimilar components:
- The somewhat poorly drained Ipava soils in the higher positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Drury Series

Taxonomic classification: Fine-silty, mixed, superactive, mesic Dystric Eutrudepts

Typical Pedon

Drury silt loam, 2 to 5 percent slopes, 1,100 feet east and 1,400 feet north of the southwest corner of sec. 4, T. 3 N., R. 3 E.

Ap—0 to 8 inches; brown (10YR 4/3) silt loam, brown (10YR 5/3) dry; moderate fine granular structure; friable; few very fine roots; slightly acid; clear smooth boundary.

Bw1—8 to 17 inches; brown (10YR 4/3) silt loam; moderate fine subangular blocky structure; friable; few very fine roots; few distinct brown (10YR 4/3) organic coatings on faces of peds and lining pores; clear smooth boundary.

Bw2—17 to 26 inches; dark yellowish brown (10YR 4/4) silt loam; moderate fine subangular blocky structure; friable; few very fine roots; few distinct dark brown (10YR 3/3) organic coatings on faces of peds and lining pores; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation with diffuse boundaries in ped interiors; neutral; gradual smooth boundary.

Bw3—26 to 35 inches; dark yellowish brown (10YR 4/4) silt loam; weak coarse subangular blocky structure; friable; few distinct dark brown (10YR 3/3) organic coatings on faces of peds and lining pores; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation with diffuse boundaries in ped interiors; slightly acid; gradual smooth boundary.

C1—35 to 45 inches; silt loam, 78 percent yellowish brown (10YR 5/4), 20 percent dark yellowish brown (10YR 4/4), and 2 percent brown (10YR 5/3); massive; friable; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation with diffuse boundaries in ped interiors; moderately acid; gradual smooth boundary.

C2—45 to 60 inches; silt loam, 70 percent yellowish brown (10YR 5/4) and 30 percent dark yellowish brown (10YR 4/6); massive; friable; few very fine roots; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation with diffuse boundaries throughout; common fine distinct grayish brown (10YR 5/2) iron depletions along pores; moderately acid.

Range in Characteristics

Content of clay in the control section: 18 to 25 percent

Ap horizon:
Value—3 or 4
Chroma—2 to 4

Bw horizon:
Value—4 or 5
Chroma—3 to 6

C horizon:
Value—3 to 6
Chroma—2 to 4
Texture—silt loam or stratified silt loam, loam, and very fine sandy loam

75B—Drury silt loam, 2 to 5 percent slopes

Setting

Landform: Alluvial fans
Position on the landform: Footslopes

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Slope alluvium

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Drury and similar soils: 85 percent
Dissimilar components: 15 percent

Similar soils:
- Soils that have more rock fragments throughout

Dissimilar components:
- Small areas of gravelly or stony soils adjacent to the bluffs

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

75C2—Drury silt loam, 5 to 10 percent slopes, eroded

Setting

Landform: Alluvial fans
Position on the landform: Footslopes

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Slope alluvium
Other properties: This soil has a thinner surface layer than the Drury soil in map unit 75B.

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Drury and similar soils: 85 percent
Dissimilar components: 15 percent

Similar soils:
- Soils that have more rock fragments throughout

Dissimilar components:
- Small areas of gravelly or stony soils adjacent to the bluffs

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

536—Dumps, mine

Setting

Landform: Uplands and flood plains
Position on the landform: Variable

Component Description

- This map unit consists of nearly level to very steep accumulations of refuse derived from the washing and separation of coal. The refuse consists of shale and coal fragments and sandstone cobbles. It is very acidic and supports little vegetation.
- Soil properties are variable. Onsite investigation is needed to determine the properties in specific areas.

Composition

Dumps: 95 percent
Dissimilar components: 5 percent

Dissimilar components:
- Small areas of extremely acid water

Elburn Series

Taxonomic classification: Fine-silty, mixed, superactive, mesic Aquic Argiudolls

Typical Pedon

Elburn silt loam, 0 to 2 percent slopes, 532 feet north and 2,200 feet west of the southeast corner of sec. 22, T. 4 N., R. 3 E.

Ap—0 to 7 inches; very dark gray (10YR 3/1) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; few very fine roots; neutral; abrupt smooth boundary.

A—7 to 17 inches; very dark gray (10YR 3/1) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; few very fine roots; neutral; abrupt smooth boundary.

Bt1—17 to 26 inches; brown (10YR 4/3) silty clay loam; moderate fine subangular blocky structure; friable; few very fine roots; many distinct very dark gray (10YR 3/1) organic coatings and common faint dark grayish brown (10YR 4/2) clay films on faces of peds and lining pores; common fine distinct yellowish brown (10YR 5/6 and 5/8) masses of iron accumulation with diffuse boundaries in ped interiors; few fine distinct grayish brown (10YR 5/2) iron depletions along root channels and pores; slightly acid; clear smooth boundary.

Bt2—26 to 38 inches; brown (10YR 5/3) silty clay loam; moderate medium subangular blocky structure; firm; many distinct dark grayish brown (10YR 4/2) clay films and common distinct very dark gray (10YR 3/1) organic coatings on faces of peds and lining pores; common fine distinct yellowish brown (10YR 5/6 and 5/8) masses of iron accumulation with diffuse boundaries in ped interiors; common fine distinct light brownish gray (10YR 6/2) iron depletions along pores; slightly acid; clear smooth boundary.

Bt3—38 to 54 inches; brown (10YR 5/3) silty clay loam; moderate medium prismatic structure; firm; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds and lining pores and few distinct very dark gray (10YR 3/1) organic coatings lining pores; many fine distinct yellowish brown (10YR 5/6 and 5/8) masses of iron accumulation and few fine black (10YR 2/1) masses of manganese accumulation with diffuse boundaries in ped interiors; common fine distinct light brownish gray (10YR 6/2) iron depletions along pores; moderately acid; clear smooth boundary.

2Bt4—54 to 62 inches; brown (10YR 5/3) clay loam; weak coarse subangular blocky structure; friable; few distinct dark grayish brown (10YR 4/2) clay films on faces of peds and lining pores; many fine distinct yellowish brown (10YR 5/6 and 5/8) masses of iron accumulation and few fine black (10YR 2/1) masses of manganese accumulation with diffuse boundaries in ped interiors; common fine distinct light brownish gray (10YR 6/2) iron depletions along pores; neutral; clear smooth boundary.

2Cg—62 to 70 inches; light brownish gray (10YR 6/2), stratified silt loam and loam; massive; friable; many fine distinct light olive brown (2.5Y 5/6) masses of iron accumulation and few fine black (10YR 2/1) masses of manganese accumulation with diffuse boundaries along pores; strongly acid.

Range in Characteristics

Thickness of the loess: 40 to 60 inches
Thickness of the mollic epipedon: 10 to 18 inches
Content of clay in the control section: 27 to 35 percent

Bt horizon:
Value—4 or 5

198A—Elburn silt loam, 0 to 2 percent slopes

Setting

Landform: Rises on stream terraces
Position on the landform: Summits

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Parent material: Loess or other silty material and the underlying outwash

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Elburn and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
• Soils that have less sand in the lower part of the subsoil

Dissimilar components:
• The well drained Plano soils in the higher positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Elco Series

Taxonomic classification: Fine-silty, mixed, superactive, mesic Oxyaquic Hapludalfs

Typical Pedon

Elco silt loam, 18 to 25 percent slopes, eroded, 2,530 feet west and 1,598 feet south of the northeast corner of sec. 16, T. 5 N., R. 3 E.

Ap—0 to 5 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; common very fine roots; moderately acid; abrupt smooth boundary.

Bt1—5 to 9 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine subangular blocky structure; friable; few very fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings lining root channels and pores and as pore fillings; few fine distinct yellowish brown (10YR 5/8) masses of iron accumulation and few fine black (10YR 2/1) manganese concretions with diffuse boundaries in ped interiors; strongly acid; clear smooth boundary.

Bt2—9 to 15 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine and medium subangular blocky structure; firm; few very fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings lining root channels and pores; common distinct dark yellowish brown (10YR 4/4) clay films on faces of peds and lining pores; few fine distinct yellowish brown (10YR 5/8) masses of iron accumulation and few fine black (10YR 2/1) manganese concretions with diffuse boundaries in ped interiors; very strongly acid; clear smooth boundary.

Bt3—15 to 25 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; firm; few very fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings lining root channels and pores; common distinct dark yellowish brown (10YR 4/4) clay films on faces of peds and lining pores; few fine distinct yellowish brown (10YR 5/8) masses of iron accumulation and few fine black (10YR 2/1) manganese concretions with diffuse boundaries in ped interiors; very strongly acid; clear smooth boundary.

2Btg1—25 to 32 inches; gray (10YR 5/1) silty clay loam; moderate medium and coarse subangular blocky structure; firm; common distinct yellowish brown (10YR 5/4) clay films on faces of peds and lining pores; few fine distinct dark yellowish brown (10YR 4/6) masses of iron accumulation and few black (10YR 2/1) manganese concretions with diffuse boundaries along pores and ped surfaces; about 1 percent fine gravel; strongly acid; clear smooth boundary.

2Btg2—32 to 41 inches; silty clay loam, 80 percent gray (10YR 5/1) and 20 percent light gray (10YR 6/1); moderate coarse subangular blocky structure; firm; few distinct yellowish brown (10YR 5/4) clay films on faces of peds and lining pores; few fine distinct dark yellowish brown (10YR 4/6) and few fine prominent yellowish red (5YR 5/6) masses of iron accumulation and few fine black (10YR 2/1) manganese concretions with diffuse boundaries along pores and ped surfaces; strongly acid; clear smooth boundary.

2Btg3—41 to 60 inches; light gray (10YR 6/1) and gray (10YR 5/1) silty clay loam; moderate coarse subangular blocky structure; firm; few fine distinct dark yellowish brown (10YR 4/6), few fine distinct yellowish brown (10YR 5/6), and few fine prominent yellowish red (5YR 5/6) masses of iron accumulation and common fine black (10YR 2/1) manganese concretions with diffuse boundaries along pores and ped surfaces; strongly acid.

Range in Characteristics

Thickness of the loess: 20 to 40 inches
Content of clay in the control section: 27 to 35 percent

E horizon (if it occurs):
Value—4 or 5
Chroma—3 or 4

Bt horizon:
Value—4 or 5

2Btg horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 or 2

119D2—Elco silt loam, 10 to 18 percent slopes, eroded

Setting

Landform: Side slopes along upland drainageways
Position on the landform: Shoulders and backslopes

Soil Properties and Qualities

Drainage class: Moderately well drained
Parent material: Loess and the underlying paleosol, which formed in till

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Elco and similar soils: 90 percent
Dissimilar components: 10 percent

Similar soils:
- Soils that have a surface layer of silty clay loam
- Soils that have less sand in the lower part of the solum

Dissimilar components:
- The well drained Hickory soils, which have less clay in the lower part of the subsoil than the Elco soil; in areas downslope from the Elco soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

119E2—Elco silt loam, 18 to 25 percent slopes, eroded

Setting

Landform: Side slopes along upland drainageways
Position on the landform: Shoulders and backslopes

Soil Properties and Qualities

Drainage class: Moderately well drained
Parent material: Loess and the underlying paleosol, which formed in till

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Elco and similar soils: 90 percent
Dissimilar components: 10 percent

Similar soils:
- Soils that have a surface layer of silty clay loam
- Soils that have less sand in the lower part of the solum

Dissimilar components:
- The well drained Hickory soils, which have less clay in the lower part of the subsoil than the Elco soil; in areas downslope from the Elco soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Elkhart Series

Taxonomic classification: Fine-silty, mixed, superactive, mesic Typic Argiudolls
Taxadjunct features: The Elkhart soil in map unit 567C2 has a thinner dark surface layer than is defined as the range for the series. This soil is classified as a fine-silty, mixed, superactive, mesic Mollic Hapludalf.

Typical Pedon

Elkhart silty clay loam, 5 to 10 percent slopes, eroded, 2,585 feet north and 225 feet west of the southeast corner of sec. 15, T. 10 N., R. 5 E., in Peoria County:

Ap—0 to 8 inches; mixed very dark grayish brown (10YR 3/2) and brown (10YR 4/3) silty clay loam, grayish brown (10YR 5/2) dry; weak fine subangular blocky structure parting to weak fine granular; friable; many very fine roots; slightly acid; abrupt smooth boundary.

Bt1—8 to 13 inches; brown (10YR 4/4) silty clay loam; moderate fine subangular blocky structure; friable; common very fine roots; common distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; slightly acid; clear smooth boundary.

Bt2—13 to 21 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine and very fine subangular blocky structure; firm; common very fine roots; few faint dark yellowish brown (10YR 4/4) clay films on faces of peds; neutral; clear smooth boundary.

Bt3—21 to 32 inches; yellowish brown (10YR 5/4) silty clay loam; weak medium prismatic structure parting to moderate medium angular and subangular blocky; firm; common very fine roots; few faint dark yellowish brown (10YR 4/4) clay films on faces of peds; neutral; clear smooth boundary.

BC—32 to 39 inches; yellowish brown (10YR 5/4) silt loam; weak coarse prismatic structure; friable; few very fine roots; common fine prominent strong brown (7.5YR 5/6) masses of iron accumulation and black (10YR 2/1) masses of manganese accumulation with diffuse boundaries in ped interiors; common fine distinct grayish brown (10YR 5/2) iron depletions along pores; very slightly effervescent; moderately alkaline; clear smooth boundary.

C—39 to 60 inches; brown (10YR 5/3) silt loam; massive; friable; few very fine roots; common medium prominent yellowish red (5YR 4/6) and strong brown (7.5YR 5/6) masses of iron accumulation and black (10YR 2/1) masses of manganese accumulation with diffuse boundaries in ped interiors; common fine faint light brownish gray (10YR 6/2) iron depletions along pores; slightly effervescent; moderately alkaline.

Range in Characteristics

Thickness of dark surface layer: 5 to 9 inches
Depth to carbonates: 20 to 40 inches
Content of clay in the control section: 27 to 35 percent

Ap horizon:
Value—2 to 4
Chroma—1 to 3
Texture—silty clay loam or silt loam

Bt horizon:
Hue—7.5YR or 10YR
Chroma—4 to 6

567B2—Elkhart silty clay loam, 2 to 5 percent slopes, eroded

Setting

Landform: Side slopes along upland drainageways
Position on the landform: Shoulders

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Loess

Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Elkhart and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
• Soils that have carbonates at a depth of more than 40 inches

Dissimilar components:
• The somewhat poorly drained Ipava soils in the less sloping positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

• "Agronomy" section
• "Wildlife Habitat" section
• "Engineering" section
• "Soil Properties" section

567C2—Elkhart silty clay loam, 5 to 10 percent slopes, eroded

Setting

Landform: Side slopes along upland drainageways
Position on the landform: Shoulders

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Loess

Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Elkhart and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
• Soils that have carbonates at a depth of more than 40 inches

Dissimilar components:
• The somewhat poorly drained Ipava soils in the less sloping positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

• "Agronomy" section
• "Wildlife Habitat" section
• "Engineering" section
• "Soil Properties" section

Fayette Series

Taxonomic classification: Fine-silty, mixed, superactive, mesic Typic Hapludalfs

Typical Pedon

Fayette silt loam, 2 to 5 percent slopes, eroded, 2,310 feet east and 1,584 feet north of the southwest corner of sec. 35, T. 3 N., R. 2 E.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine granular structure; friable; few very fine roots; slightly acid; clear smooth boundary.
Bt1—8 to 13 inches; brown (10YR 4/3) silty clay loam; moderate very fine subangular blocky structure; friable; few very fine roots; few distinct dark grayish brown (10YR 4/2) clay films and few distinct light gray (10YR 7/2 dry) silt coatings on faces of peds and few distinct very dark grayish brown (10YR 3/2) organic coatings lining root channels and pores; moderately acid; clear smooth boundary.
Bt2—13 to 21 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate very fine and fine subangular blocky structure; firm; few very fine roots; common distinct brown (10YR 4/3) clay films on faces of peds and few distinct very dark grayish brown (10YR 3/2) organic coatings lining root channels and pores; strongly acid; clear smooth boundary.
Bt3—21 to 31 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine subangular blocky

structure; firm; few very fine roots; common distinct brown (10YR 4/3) clay films on faces of peds and few distinct very dark grayish brown (10YR 3/2) organic coatings lining root channels and pores; few fine distinct black (10YR 2/1) manganese concretions with sharp boundaries in ped interiors; strongly acid; clear smooth boundary.

Bt4—31 to 45 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; friable; few very fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; few fine distinct black (10YR 2/1) manganese concretions with sharp boundaries in ped interiors and few fine distinct dark yellowish brown (10YR 4/4) masses of iron accumulation with sharp boundaries along root channels; strongly acid; clear smooth boundary.

BC—45 to 56 inches; yellowish brown (10YR 5/4) silty clay loam; weak medium and coarse subangular blocky structure; friable; few distinct brown (10YR 4/3) clay films on faces of peds; few fine distinct dark yellowish brown (10YR 4/4) masses of iron accumulation with sharp boundaries along root channels; strongly acid; clear smooth boundary.

C—56 to 80 inches; yellowish brown (10YR 5/4) silt loam; massive; friable; few fine distinct dark yellowish brown (10YR 4/4) masses of iron accumulation with sharp boundaries along root channels; very strongly acid.

Range in Characteristics

Content of clay in the control section: 28 to 35 percent

Ap horizon:
Chroma—2 or 3

Bt horizon:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—3 to 6

C horizon:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—3 or 4

280B2—Fayette silt loam, 2 to 5 percent slopes, eroded

Setting

Landform: Interfluves
Position on the landform: Shoulders

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Loess

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Fayette and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
- Soils that have a seasonal high water table at a depth of less than 72 inches

Dissimilar components:
- The somewhat poorly drained Keomah soils on nearby summits

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

280C2—Fayette silt loam, 5 to 10 percent slopes, eroded

Setting

Landform: Head slopes and side slopes along upland drainageways
Position on the landform: Shoulders

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Loess

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Fayette and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
- Soils that have a surface layer of silty clay loam
- Soils that have a seasonal high water table at a depth of less than 72 inches

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

280D2—Fayette silt loam, 10 to 18 percent slopes, eroded

Setting

Landform: Side slopes along upland drainageways
Position on the landform: Shoulders

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Loess

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Fayette and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
- Soils that have a surface layer of silty clay loam
- Soils that have more sand or more sand and clay in the lower part of the subsoil

Dissimilar components:
- The moderately well drained Blyton soils on narrow flood plains

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

280E2—Fayette silt loam, 18 to 25 percent slopes, eroded

Setting

Landform: Side slopes along upland drainageways
Position on the landform: Backslopes

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Loess

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Fayette and similar soils: 90 percent
Dissimilar components: 10 percent

Similar soils:
- Soils that have a surface layer of silty clay loam
- Soils that have slopes of more than 25 percent
- Soils that have more sand or more sand and clay in the lower part of the subsoil
- Soils that have less clay in the subsoil

Dissimilar components:
- The moderately well drained Blyton soils on narrow flood plains

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Greenbush Series

Taxonomic classification: Fine-silty, mixed, superactive, mesic Mollic Hapludalfs

Typical Pedon

Greenbush silt loam, 2 to 5 percent slopes, 1,950 feet west and 1,400 feet south of the northeast corner of sec. 1, T. 5 N., R. 3 E.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; common very fine roots; slightly acid; clear smooth boundary.

BE—9 to 14 inches; brown (10YR 5/3) silt loam; weak medium platy structure parting to weak fine granular; friable; few very fine roots; common distinct light gray (10YR 7/2 dry) silt coatings on faces of peds; moderately acid; gradual smooth boundary.

Bt1—14 to 18 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; firm; few very fine roots; common distinct light gray (10YR 7/2 dry) silt coatings, few distinct very dark grayish brown (10YR 3/2) organic coatings, and common distinct brown (10YR 4/3) clay films on faces of peds; common fine black (10YR 2/1) manganese concretions with sharp boundaries in ped interiors; strongly acid; gradual smooth boundary.

Bt2—18 to 24 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; few distinct light gray (10YR 7/2 dry) silt coatings and many distinct brown (10YR 4/3) clay films on faces of peds and few distinct very dark grayish brown (10YR 3/2) organic coatings lining root channels and pores; common fine black (10YR 2/1) manganese concretions with sharp boundaries in ped interiors; strongly acid; gradual smooth boundary.

Bt3—24 to 38 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; few distinct light gray (10YR 7/2 dry) silt coatings and common distinct brown (10YR 4/3) clay films on faces of peds and few distinct very dark grayish brown (10YR 3/2) organic coatings lining root channels and pores; few fine black (10YR 2/1) manganese concretions with sharp boundaries in ped interiors; few fine distinct grayish brown (2.5Y 5/2) iron depletions along root channels and pores; very strongly acid; gradual smooth boundary.

Bt4—38 to 54 inches; yellowish brown (10YR 5/4) silty clay loam; weak coarse prismatic structure parting to weak coarse subangular blocky; firm; few very fine roots; few distinct brown (10YR 4/3) clay films on faces of peds and few distinct dark grayish brown (10YR 4/2) clay films lining root channels and pores; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation and few fine black (10YR 2/1) manganese concretions with diffuse boundaries in ped interiors; common fine distinct grayish brown (2.5Y 5/2) iron depletions along root channels and pores; very strongly acid; gradual smooth boundary.

BC—54 to 60 inches; yellowish brown (10YR 5/4) silty clay loam; weak coarse prismatic structure; firm; very few distinct brown (10YR 4/3) clay films on faces of peds and few distinct dark grayish brown (10YR 4/2) clay films lining pores; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation and few fine black (10YR 2/1) manganese concretions with diffuse boundaries in ped interiors; common fine distinct grayish brown (2.5Y 5/2) iron depletions along root channels and pores; very strongly acid.

Range in Characteristics

Content of clay in the control section: 27 to 35 percent

675B—Greenbush silt loam, 2 to 5 percent slopes

Setting

Landform: Interfluves
Position on the landform: Summits and shoulders

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Loess

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Greenbush and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
- Soils that have a lighter colored surface layer
- Soils that have slopes of more than 5 percent
- Soils that have a thicker dark surface layer

Dissimilar components:
- The poorly drained Denny soils in shallow depressions

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Hickory Series

Taxonomic classification: Fine-loamy, mixed, active, mesic Typic Hapludalfs

Typical Pedon

Hickory silt loam, 18 to 35 percent slopes, 2,390 feet north and 1,730 feet west of the southeast corner of sec. 24, T. 3 N., R. 2 E.

A—0 to 2 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine granular structure; friable; many very fine roots; slightly acid; abrupt smooth boundary.
E—2 to 7 inches; silt loam, 80 percent dark yellowish brown (10YR 4/4) and 20 percent dark grayish brown (10YR 4/2); weak thin platy structure parting to weak fine granular; friable; common very fine roots; strongly acid; clear smooth boundary.
Bt1—7 to 17 inches; strong brown (7.5YR 4/6) clay loam; moderate fine subangular blocky structure; firm; few very fine roots; few distinct grayish brown (10YR 5/2) silt coatings lining root channels and pores and common distinct brown (10YR 4/3) clay films on faces of peds and lining pores; about 2 percent fine gravel; strongly acid; clear smooth boundary.
Bt2—17 to 26 inches; strong brown (7.5YR 4/6) clay loam; moderate fine subangular blocky structure; firm; common distinct brown (10YR 4/3) clay films on faces of peds and lining pores; few fine black (10YR 2/1) masses of manganese accumulation with diffuse boundaries in ped interiors; about 2 percent fine gravel; strongly acid; clear smooth boundary.
Bt3—26 to 43 inches; clay loam, 80 percent strong brown (7.5YR 4/6) and 20 percent strong brown (7.5YR 5/6); moderate medium subangular blocky structure; firm; few distinct brown (10YR 4/3) clay films on faces of peds; few fine distinct reddish yellow (7.5YR 6/6) masses of iron accumulation and few fine black (10YR 2/1) masses of manganese accumulation with diffuse boundaries in ped interiors; about 2 percent fine gravel; strongly acid; clear smooth boundary.
C1—43 to 74 inches; clay loam, 80 percent strong brown (7.5YR 4/6) and 20 percent strong brown (7.5YR 5/6); massive; firm; few fine distinct reddish yellow (7.5YR 6/6) masses of iron accumulation and few fine black (10YR 2/1) masses of manganese accumulation with diffuse boundaries throughout; about 3 percent fine gravel; very strongly acid; clear smooth boundary.
C2—74 to 80 inches; clay loam, 80 percent strong brown (7.5YR 4/6) and 20 percent strong brown (7.5YR 5/6); massive; firm; few fine distinct reddish yellow (7.5YR 6/6) masses of iron accumulation and few fine black (10YR 2/1) masses of manganese accumulation with diffuse boundaries throughout; about 3 percent fine gravel; slightly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the loess: 0 to 20 inches
Content of clay in the control section: 27 to 35 percent

A horizon:
Value—3 or 4
Chroma—2 or 3
Texture—silt loam or loam

E horizon:
Value—4 to 6
Chroma—2 to 4

Bt horizon:
Value—4 to 6
Chroma—3 to 6
Texture—clay loam or silty clay loam

C horizon:
Value—4 to 6
Chroma—2 to 6
Texture—loam or clay loam

8D2—Hickory silt loam, 10 to 18 percent slopes, eroded

Setting

Landform: Side slopes along upland drainageways
Position on the landform: Backslopes

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Till

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Hickory and similar soils: 90 percent
Dissimilar components: 10 percent

Similar soils:
- Soils that have less sand throughout
- Soils that have a surface layer of silty clay loam or clay loam

Dissimilar components:
- The somewhat poorly drained Atlas soils, which have more sand in the subsoil than the Hickory soil; in positions on the landform upslope from those of the Hickory soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

8E2—Hickory loam, 18 to 25 percent slopes, eroded

Setting

Landform: Side slopes along upland drainageways
Position on the landform: Backslopes

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Till
Other properties: This soil has more sand in the surface layer than the Hickory soil in map unit 8F.

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Hickory and similar soils: 90 percent
Dissimilar components: 10 percent

Similar soils:
- Soils that have less sand throughout
- Soils that have a surface layer of silty clay loam or clay loam
- Soils that are calcareous at a depth of less than 40 inches

Dissimilar components:
- The somewhat poorly drained Atlas soils in positions on the landform upslope from those of the Hickory soil
- Marseilles soils, which are moderately deep to bedrock; in positions on the landform downslope from those of the Hickory soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

8F—Hickory silt loam, 18 to 35 percent slopes

Setting

Landform: Side slopes along upland drainageways
Position on the landform: Backslopes

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Till

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Hickory and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
- Soils that have a surface layer of loam
- Soils that are calcareous at a depth of less than 40 inches

Dissimilar components:
- Marseilles soils, which are moderately deep to bedrock; in positions on the landform downslope from those of the Hickory soil
- Bedrock outcroppings and escarpments

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

8G—Hickory silt loam, 35 to 60 percent slopes

Setting

Landform: Side slopes along upland drainageways
Position on the landform: Backslopes

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Till

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Hickory and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
- Soils that have a surface layer of loam
- Soils that are calcareous at a depth of less than 40 inches

Dissimilar components:
- Marseilles soils, which are moderately deep to bedrock; in positions on the landform downslope from those of the Hickory soil
- Bedrock outcroppings and escarpments

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Huntsville Series

Taxonomic classification: Fine-silty, mixed, superactive, mesic Cumulic Hapludolls

Typical Pedon

Huntsville silt loam, 0 to 2 percent slopes, frequently flooded, 2,295 feet north and 2,625 feet east of the southwest corner of sec. 31, T. 7 N., R. 2 E.

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; common very fine and few fine roots; neutral; clear smooth boundary.

A1—8 to 18 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak medium subangular blocky structure parting to weak fine granular; friable; few very fine roots; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; neutral; gradual smooth boundary.

A2—18 to 32 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine and medium subangular blocky structure; friable; few distinct very dark gray (10YR 3/1) organic coatings on faces of peds; neutral; gradual smooth boundary.

A3—32 to 43 inches; dark brown (10YR 3/3) silt loam, brown (10YR 5/3) dry; weak medium subangular blocky structure; friable; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; slightly acid; gradual smooth boundary.

AC—43 to 60 inches; brown (10YR 4/3) silt loam; weak coarse subangular blocky structure; friable; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; slightly acid.

Range in Characteristics

Thickness of the mollic epipedon: 24 to 45 inches
Content of clay in the control section: 18 to 27 percent

Ap and A horizons:
Chroma—2 or 3

3077A—Huntsville silt loam, 0 to 2 percent slopes, frequently flooded

Setting

Landform: Rises on flood plains
Position on the landform: Summits

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Stream alluvium

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Huntsville and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
- Soils that have a dark surface layer less than 24 inches thick

Dissimilar components:
- The poorly drained Sawmill and somewhat poorly drained Tice soils in the lower positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section

- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Ipava Series

Taxonomic classification: Fine, smectitic, mesic Aquic Argiudolls

Typical Pedon

Ipava silt loam, 0 to 2 percent slopes, 2,100 feet south and 60 feet east of the northwest corner of sec. 16, T. 7 N., R. 1 E.

Ap—0 to 7 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; weak very fine granular structure; friable; common very fine roots; neutral; clear smooth boundary.

A—7 to 15 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; moderate very fine subangular blocky structure parting to weak very fine granular; friable; common very fine roots; neutral; clear smooth boundary.

AB—15 to 20 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; moderate very fine subangular blocky structure; friable; common very fine roots; slightly acid; clear smooth boundary.

Bt—20 to 24 inches; brown (10YR 4/3) silty clay loam; moderate fine subangular blocky structure; friable; few very fine roots; common distinct dark gray (10YR 4/1) clay films and many distinct very dark gray (10YR 3/1) organo-clay films on faces of peds and lining pores; common fine distinct yellowish brown (10YR 5/4) masses of iron accumulation with diffuse boundaries in ped interiors; common fine distinct grayish brown (10YR 5/2) iron depletions along pores and root channels; moderately acid; clear smooth boundary.

Btg1—24 to 29 inches; grayish brown (10YR 5/2) silty clay loam; moderate fine subangular blocky structure; friable; few very fine roots; few distinct dark gray (10YR 4/1) clay films on faces of peds and few distinct very dark gray (10YR 3/1) organo-clay films lining root channels and pores; many fine distinct yellowish brown (10YR 5/4) and few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation with diffuse boundaries along pores and root channels; slightly acid; clear smooth boundary.

Btg2—29 to 35 inches; grayish brown (10YR 5/2) silty clay loam; moderate medium subangular blocky structure; friable; few very fine roots; few distinct dark gray (10YR 4/1) clay films on faces of peds and few distinct very dark gray (10YR 3/1) organo-clay films lining root channels and pores; common fine distinct yellowish brown (10YR 5/4) and few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation and few black (10YR 2/1) masses of manganese accumulation with diffuse boundaries along pores and root channels; neutral; clear smooth boundary.

Btg3—35 to 40 inches; dark grayish brown (2.5Y 4/2) silt loam; moderate medium subangular blocky structure; friable; few very fine roots; very few distinct dark gray (10YR 4/1) clay films on faces of peds and very few distinct very dark gray (10YR 3/1) organo-clay films lining root channels and pores; few fine prominent yellowish brown (10YR 5/4) and few medium prominent yellowish brown (10YR 5/6) masses of iron accumulation and few black (10YR 2/1) masses of manganese accumulation with diffuse boundaries along pores and root channels; neutral; clear smooth boundary.

BCg—40 to 51 inches; grayish brown (2.5Y 5/2) silt loam; weak coarse subangular blocky structure; friable; very few distinct very dark gray (10YR 3/1) organo-clay films lining pores; few fine prominent yellowish brown (10YR 5/4) and many medium prominent yellowish brown (10YR 5/6) masses of iron accumulation and few black (10YR 2/1) masses of manganese accumulation with diffuse boundaries along pores; neutral; gradual smooth boundary.

Cg—51 to 60 inches; grayish brown (2.5Y 5/2) silt loam; massive; friable; few fine distinct yellowish brown (10YR 5/4) and many medium distinct yellowish brown (10YR 5/6) masses of iron accumulation and few manganese accumulations with diffuse boundaries along pores; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches
Content of clay in the control section: 35 to 43 percent

Btg horizon:
Hue—10YR or 2.5Y
Value—4 or 5

43A—Ipava silt loam, 0 to 2 percent slopes

Setting

Landform: Rises on upland drainage divides
Position on the landform: Summits

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Parent material: Loess

Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Ipava and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
- Soils that have gray colors at a depth of more than 36 inches or less than 12 inches
- Soils that have a thinner dark surface layer

Dissimilar components:
- The poorly drained Denny soils in closed depressions

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Kendall Series

Taxonomic classification: Fine-silty, mixed, superactive, mesic Aeric Endoaqualfs

Typical Pedon

Kendall silt loam, 0 to 2 percent slopes, 96 feet south and 48 feet west of the center of sec. 12, T. 3 N., R. 4 W., in Schuyler County:

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine granular structure; very friable; few very fine roots; slightly acid; clear smooth boundary.

E—9 to 16 inches; light brownish gray (10YR 6/2) silt loam; weak thin platy structure; very friable; few very fine roots; slightly acid; clear smooth boundary.

BE—16 to 20 inches; brown (10YR 5/3) silty clay loam; moderate medium subangular blocky structure; friable; few distinct grayish brown (10YR 5/2) clay films and common distinct white (10YR 8/1) silt coatings on faces of peds and lining pores; few fine distinct brown (7.5YR 4/4) masses of iron accumulation and few fine black (10YR 2/1) manganese concretions with diffuse boundaries throughout; moderately acid; clear smooth boundary.

Bt1—20 to 33 inches; brown (10YR 4/3) silty clay loam; moderate medium subangular blocky structure; friable; common distinct grayish brown (10YR 5/2) clay films and few distinct white (10YR 8/1) silt coatings on faces of peds and lining pores; few fine distinct brown (7.5YR 4/4) masses of iron accumulation and common fine black (10YR 2/1) manganese concretions with diffuse boundaries throughout; moderately acid; clear smooth boundary.

Bt2—33 to 44 inches; silty clay loam, 60 percent grayish brown (10YR 5/2) and 40 percent brown (10YR 5/3); moderate medium subangular blocky structure; friable; common distinct grayish brown (10YR 5/2) clay films on faces of peds; few fine distinct brown (7.5YR 5/4) masses of iron accumulation and common fine and coarse black (10YR 2/1) manganese concretions with diffuse boundaries throughout; slightly acid; clear smooth boundary.

2Btg—44 to 50 inches; light brownish gray (10YR 6/2) silt loam; moderate medium subangular blocky structure; friable; few distinct grayish brown (10YR 5/2) clay films on faces of peds; many fine prominent brown (7.5YR 5/4) masses of iron accumulation and common medium black (10YR 2/1) manganese concretions with diffuse boundaries along pores; slight increase in sand content; neutral; clear smooth boundary.

2BCg—50 to 60 inches; light brownish gray (10YR 6/2) silt loam; weak medium subangular blocky structure; friable; few distinct grayish brown (10YR 5/2) clay films lining pores; many fine prominent brown (7.5YR 5/4) masses of iron accumulation and few black (10YR 2/1) manganese concretions with diffuse boundaries along pores; neutral.

Range in Characteristics

Thickness of the loess: 40 to 60 inches

Bt horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 or 5
Chroma—2 or 3

2Btg horizon:
Value—4 to 6
Texture—loam, clay loam, or silt loam

242A—Kendall silt loam, 0 to 2 percent slopes

Setting

Landform: Rises on stream terraces
Position on the landform: Summits

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Parent material: Loess or other silty material and the underlying outwash

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Kendall and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
• Soils that have less sand in the lower part of the subsoil

Dissimilar components:
• The well drained St. Charles soils in the more sloping positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Keomah Series

Taxonomic classification: Fine, smectitic, mesic Aeric Endoaqualfs

Typical Pedon

Keomah silt loam, 0 to 2 percent slopes, 660 feet south and 1,155 feet west of the center of sec. 14, T. 6 N., R. 2 E.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak very fine granular structure; very friable; common very fine roots; neutral; abrupt smooth boundary.

E—8 to 15 inches; silt loam, 95 percent grayish brown (10YR 5/2) and 5 percent yellowish brown (10YR 5/4); moderate medium platy structure parting to moderate fine granular; very friable; few very fine roots; neutral; clear smooth boundary.

Bt—15 to 20 inches; brown (10YR 5/3) silty clay loam; moderate fine subangular blocky structure; friable; few very fine roots; many distinct dark gray (10YR 4/1) clay films on faces of peds, few distinct very dark gray (10YR 3/1) organic coatings lining root channels and pores, and few distinct light gray (10YR 7/2 dry) silt coatings on faces of peds; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation and few black (10YR 2/1) masses of manganese accumulation with diffuse boundaries in ped interiors; common fine distinct grayish brown (10YR 5/2) iron depletions along pores; moderately acid; clear smooth boundary.

Btg1—20 to 34 inches; light brownish gray (10YR 6/2) silty clay loam; moderate medium subangular blocky structure; firm; few very fine roots; few distinct dark grayish brown (10YR 4/2) clay films on faces of peds and few distinct very dark gray (10YR 3/1) organo-clay films lining root channels and pores; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation and few black (10YR 2/1) masses of manganese accumulation with diffuse boundaries along ped surfaces and pores; neutral; clear smooth boundary.

Btg2—34 to 42 inches; light brownish gray (2.5Y 6/2) silty clay loam; moderate coarse subangular blocky structure; firm; few distinct dark grayish brown (10YR 4/2) clay films on faces of peds; many medium prominent yellowish brown (10YR 5/6) masses of iron accumulation and few black (10YR 2/1) masses of manganese accumulation with diffuse boundaries along pores; neutral; clear smooth boundary.

BCg—42 to 49 inches; light brownish gray (2.5Y 6/2) silt loam; weak coarse subangular blocky structure; friable; few distinct dark grayish brown (10YR 4/2) clay films lining pores; common medium prominent yellowish brown (10YR 5/6) masses of iron accumulation and few black (10YR 2/1) masses of manganese accumulation with diffuse boundaries along pores; neutral; clear smooth boundary.

Cg—49 to 60 inches; light brownish gray (2.5Y 6/2) silt loam; massive; friable; common medium prominent yellowish brown (10YR 5/6) masses of iron accumulation and few black (10YR 2/1) masses of manganese accumulation with diffuse boundaries along pores; neutral.

Range in Characteristics

Content of clay in the control section: 36 to 42 percent

E horizon:
Chroma—2 to 4

Bt and Btg horizons:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 or 3

Cg horizon:
Hue—10YR or 2.5Y
Value—5 or 6
Chroma—2 to 4

17A—Keomah silt loam, 0 to 2 percent slopes

Setting

Landform: Interfluves
Position on the landform: Broad summits

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Parent material: Loess

Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Keomah and similar soils: 90 percent
Dissimilar components: 10 percent

Similar soils:
- Soils that have a darker and thicker surface layer

Dissimilar components:
- The poorly drained Rushville soils in depressions
- The well drained Rozetta and Fayette soils in the more sloping positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

17B—Keomah silt loam, 2 to 5 percent slopes

Setting

Landform: Interfluves
Position on the landform: Broad summits

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Parent material: Loess

Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Keomah and similar soils: 90 percent
Dissimilar components: 10 percent

Similar soils:
- Soils that have a darker and thicker surface layer

Dissimilar components:
- The well drained Rozetta soils in the more sloping positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

9017A—Keomah silt loam, terrace, 0 to 2 percent slopes

Setting

Landform: Stream terraces
Position on the landform: Broad summits

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Parent material: Loess or other silty material

Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Keomah and similar soils: 90 percent
Dissimilar components: 10 percent

Similar soils:
- Soils that have a darker and thicker surface layer
- Soils that have more sand in the lower part of the subsoil

Dissimilar components:
- The well drained Rozetta soils in the more sloping positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

La Hogue Series

Taxonomic classification: Fine-loamy, mixed, superactive, mesic Aquic Argiudolls

Taxadjunct features: The La Hogue soils in this survey area have distinct redoximorphic concentrations in the lower part of the mollic epipedon. These soils are classified as fine-loamy, mixed, superactive, mesic Typic Argiaquolls.

Typical Pedon

La Hogue loam, 0 to 2 percent slopes, 924 feet north and 132 feet west of the southeast corner of sec. 15, T. 3 N., R. 3 E.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; common very fine roots; moderately acid; clear smooth boundary.

A—9 to 16 inches; very dark grayish brown 10YR 3/2) loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; few very fine roots; few fine distinct strong brown (7.5YR 4/6) masses of iron accumulation and few fine black (10YR 2/1) masses of manganese accumulation with diffuse boundaries throughout; moderately acid; abrupt smooth boundary.

Bt1—16 to 28 inches; brown (10YR 5/3) clay loam; moderate fine subangular blocky structure; friable; few very fine roots; few distinct dark grayish brown (10YR 4/2) clay films on faces of peds and lining pores; few fine distinct dark brown (7.5YR 3/4) iron concretions and common fine black (10YR 2/1) manganese concretions with diffuse boundaries in ped interiors and common fine distinct strong brown (7.5YR 4/6) masses of iron accumulation with diffuse boundaries along pores; few fine distinct grayish brown (10YR 5/2) iron depletions along pores; strongly acid; clear smooth boundary.

Bt2—28 to 37 inches; brown (10YR 5/3) clay loam; moderate medium subangular blocky structure; firm; few very fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds and lining pores; few fine distinct dark brown (7.5YR 3/4) iron concretions and few fine black (10YR 2/1) manganese concretions with diffuse boundaries in ped interiors and common fine distinct yellowish brown (10YR 5/8) masses of iron accumulation with diffuse boundaries along pores; common fine distinct grayish brown (10YR 5/2) iron depletions along ped surfaces and pores; strongly acid; clear smooth boundary.

Bt3—37 to 52 inches; brown (10YR 5/3) clay loam; moderate medium subangular blocky structure; firm; few very fine roots; common distinct dark grayish brown (10YR 4/2) clay films lining root channels and pores; few fine black (10YR 2/1) manganese concretions and common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation with diffuse boundaries in ped interiors; few fine distinct gray (10YR 5/1) iron depletions along pores and many fine distinct grayish brown (10YR 5/2) iron depletions along ped surfaces and pores; strongly acid; clear smooth boundary.

Bt4—52 to 58 inches; brown (10YR 5/3) clay loam; moderate coarse subangular blocky structure; firm; few distinct dark grayish brown (10YR 4/2) clay films lining root channels and pores; few fine black (10YR 2/1) manganese concretions with diffuse boundaries and common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation with diffuse boundaries in ped interiors; many medium distinct grayish brown (10YR 5/2) iron depletions along ped surfaces and pores and common medium distinct gray (10YR 5/1) iron depletions along pores; moderately acid; clear smooth boundary.

Cg—58 to 69 inches; dark grayish brown (10YR 4/2), grayish brown (10YR 5/2), and dark yellowish brown (10YR 4/4), stratified loamy sand and coarse sand; massive; friable; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation with diffuse boundaries throughout; slightly acid.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches

Content of clay in the control section: 18 to 35 percent

Cg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 or 5
Chroma—2 to 4
Texture—stratified loamy sand and coarse sand

102A—La Hogue loam, 0 to 2 percent slopes

Setting

Landform: Rises on stream terraces
Position on the landform: Summits

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Parent material: Outwash

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

La Hogue and similar soils: 90 percent
Dissimilar components: 10 percent

Similar soils:
- Soils that have less clay in the subsoil
- Soils that have gray colors at a depth of less than 36 inches

Dissimilar components:
- The well drained Onarga soils in the more sloping positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Lawson Series

Taxonomic classification: Fine-silty, mixed, superactive, mesic Aquic Cumulic Hapludolls

Typical Pedon

Lawson silt loam, 0 to 2 percent slopes, frequently flooded, 1,680 feet south and 1,070 feet west of the northeast corner of sec. 1, T. 8 N., R. 1 E.

Ap—0 to 9 inches; very dark gray (10YR 3/1) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; common very fine roots; neutral; clear smooth boundary.
A1—9 to 14 inches; very dark gray (10YR 3/1) silt loam, grayish brown (10YR 5/2) dry; weak fine subangular blocky structure parting to weak fine granular; friable; common very fine roots; neutral; clear smooth boundary.
A2—14 to 29 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine subangular blocky structure; friable; few very fine roots; neutral; clear smooth boundary.
C1—29 to 46 inches; silt loam, 60 percent very dark grayish brown (10YR 3/2) and 40 percent dark grayish brown (10YR 4/2); weak fine and medium subangular blocky structure; friable; few very fine roots; few distinct very dark gray (10YR 3/1) organic coatings lining pores; neutral; clear smooth boundary.
C2—46 to 72 inches; silt loam, 60 percent dark grayish brown (10YR 4/2) and 40 percent very dark grayish brown (10YR 3/2); strata of loam; massive; friable; few distinct very dark gray (10YR 3/1) organic coatings lining pores; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation with diffuse boundaries along pores; neutral; clear smooth boundary.
C3—72 to 80 inches; silt loam, 70 percent dark grayish brown (10YR 4/2) and 30 percent very dark grayish brown (10YR 3/2); strata of sandy loam; massive; friable; few distinct very dark gray (10YR 3/1) organic coatings lining pores; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation with diffuse boundaries along pores; neutral.

Range in Characteristics

Thickness of the mollic epipedon: 26 to 40 inches
Content of clay in the control section: 18 to 30 percent

Ap or A horizon:
Value—2 or 3
Chroma—1 or 2

C horizon:
Value—3 to 5
Chroma—1 to 3
Texture—silt loam with strata of loam or sandy loam

3451A—Lawson silt loam, 0 to 2 percent slopes, frequently flooded

Setting

Landform: Rises on flood plains
Position on the landform: Summits

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Parent material: Stream alluvium

Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Lawson and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:

- Soils that have a dark surface layer less than 24 inches thick

Dissimilar components:

- The poorly drained Sawmill soils in the lower positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Lenzburg Series

Taxonomic classification: Fine-loamy, mixed, active, calcareous, mesic Alfic Udarents

Typical Pedon

Lenzburg silty clay loam, 20 to 60 percent slopes, 2,380 feet east and 2,300 feet north of the southwest corner of sec. 8, T. 8 N., R. 4 E.

A—0 to 4 inches; silty clay loam, 80 percent brown (10YR 5/3), 10 percent brownish yellow (10YR 6/8), and 10 percent light yellowish brown (2.5Y 6/4); moderate fine subangular blocky structure; friable; many very fine roots; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; 12 percent rock fragments (sandstone, shale, and till pebbles); very slightly effervescent; neutral; abrupt wavy boundary.

AC—4 to 14 inches; brown (10YR 5/3) and light yellowish brown (2.5Y 6/4) gravelly silty clay loam; moderate medium platy structure parting to moderate very fine subangular blocky; friable; many very fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings lining pores; common fine distinct brownish yellow (10YR 6/8) masses of iron accumulation with diffuse boundaries in ped interiors; 25 percent rock fragments (glacial till and channers of sandstone and shale); slightly effervescent; slightly alkaline; clear wavy boundary.

C1—14 to 20 inches; very gravelly silty clay loam, 80 percent brown (10YR 5/3) and 20 percent dark brown (10YR 3/3), occurring in pockets randomly distributed throughout the horizon; massive; firm; common very fine and common fine roots along cleavage planes and vertical fractures; few isolated peds of relict genetic horizons with common fine and medium distinct brownish yellow (10YR 6/8) masses of iron accumulation and many fine and medium distinct light gray (2.5Y 7/1) iron depletions; 50 percent rock fragments (soft residuum of sandstone and shale); slightly effervescent; slightly alkaline; gradual wavy boundary.

C2—20 to 39 inches; gravelly silty clay loam, 80 percent brown (10YR 5/3) and 20 percent very dark gray (10YR 3/1), occurring in pockets randomly distributed throughout the horizon; massive; firm; common very fine roots along cleavage planes and vertical fractures; few isolated peds of relict genetic horizons with common fine and medium distinct brownish yellow (10YR 6/8) masses of iron accumulation and many fine and medium distinct light gray (2.5Y 7/1) iron depletions; 25 percent rock fragments (till pebbles and soft residuum of sandstone and shale); slightly effervescent; slightly alkaline; gradual wavy boundary.

C3—39 to 60 inches; silty clay loam, 80 percent yellowish brown (10YR 5/4) and 20 percent very dark gray (10YR 3/1), occurring in pockets randomly distributed throughout the horizon; massive; firm; few isolated peds of relict genetic horizons with common fine and medium distinct brownish yellow (10YR 6/8) masses of iron accumulation and many fine and medium distinct light gray (2.5Y 7/1) iron depletions; 10 percent rock fragments (till pebbles and soft residuum of sandstone and shale); strongly effervescent; slightly alkaline.

Range in Characteristics

A horizon:
Hue—10YR or 2.5Y
Value—5 or 6
Chroma—2 to 8
Texture—silty clay loam or silt loam

C horizon:
Hue—10YR, 2.5Y, or 5Y
Value—3 to 5
Chroma—1 to 8
Texture—silty clay loam, gravelly silty clay loam, very gravelly silty clay loam, or silt loam

871B—Lenzburg silt loam, 1 to 7 percent slopes

Setting

Landform: Graded spoil banks in the uplands
Position on the landform: Summits

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Cast overburden from surface mining

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Lenzburg and similar soils: 85 percent
Dissimilar components: 15 percent

Similar soils:
- Soils that have common channers of shale and stones on the surface and throughout the profile

Dissimilar components:
- Depressional areas that are ponded
- Small areas of clayey soils
- Pockets of extremely acid material

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

871D—Lenzburg silty clay loam, 7 to 20 percent slopes

Setting

Landform: Graded spoil banks in the uplands
Position on the landform: Shoulders and backslopes

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Cast overburden from surface mining

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Lenzburg and similar soils: 85 percent
Dissimilar components: 15 percent

Similar soils:
- Soils that have common channers of shale and stones on the surface and throughout the profile
- Soils that have a surface layer of silt loam
- Soils that contain fewer rock fragments

Dissimilar components:
- Pockets of extremely acid material
- Small areas of clayey soils
- Gullies

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

871G—Lenzburg silty clay loam, 20 to 60 percent slopes

Setting

Landform: Spoil banks in the uplands
Position on the landform: Backslopes

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Cast overburden from surface mining

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Lenzburg and similar soils: 85 percent
Dissimilar components: 15 percent

Similar soils:
- Soils that contain fewer rock fragments

Dissimilar components:
- Pockets of extremely acid material
- Small areas of water (between ridges)

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Lenzlo Series

Taxonomic classification: Fine-loamy, mixed, active, calcareous, mesic Mollic Endoaquents

Typical Pedon

Lenzlo silty clay loam, 1 to 7 percent slopes, occasionally flooded, 2,331 feet west and 2,264 feet south of the northeast corner of sec. 12, T. 6 N., R. 5 E.

Ap—0 to 3 inches; silty clay loam, 90 percent very dark gray (10YR 3/1) and 10 percent light brownish gray (10YR 6/2); gray (10YR 5/1) dry; weak fine subangular blocky structure; friable; many very fine to medium roots; about 5 percent randomly oriented fragments of unconsolidated sediments with common fine distinct yellowish brown (10YR 5/6) relict masses of iron accumulation along planes of weakness; about 3 percent gravel and shale channers; strongly effervescent; slightly alkaline; clear smooth boundary.

C1—3 to 20 inches; silty clay loam, 45 percent very dark gray (10YR 3/1), 40 percent very dark gray (N 3/0), and 15 percent light brownish gray (10YR 6/2); pockets of silt loam; massive; firm; many very fine and fine roots; about 40 percent randomly oriented fragments of unconsolidated sediments with common fine distinct yellowish brown (10YR 5/6) relict masses of iron accumulation along planes of weakness; few fine prominent dark brown (7.5YR 3/4) masses of iron accumulation with diffuse boundaries lining root channels in the lower 4 inches; about 10 percent clods; about 1 percent shale channers; strongly effervescent; slightly alkaline; gradual wavy boundary.

C2—20 to 41 inches; silty clay loam, 80 percent very dark gray (N 3/0) and 20 percent grayish brown (2.5Y 5/2); pockets of silt loam; massive; firm; common very fine and fine flattened roots along vertical and horizontal planes of weakness; few fine prominent dark brown (7.5YR 3/4) and distinct yellowish brown (10YR 5/6) masses of iron accumulation with diffuse boundaries lining root channels; about 10 percent clods; about 50 percent randomly oriented fragments of unconsolidated sediments; neutral; gradual wavy boundary.

C3—41 to 80 inches; silty clay loam, 80 percent very dark gray (N 3/0), 10 percent grayish brown (2.5Y 5/2), and 10 percent olive gray (5Y 4/2); massive; firm; about 5 percent clods; less than 1 percent shale channers; strongly effervescent; slightly alkaline.

Range in Characteristics

Ap horizon:
Value—3 to 6
Chroma—1 to 6

C horizon:
Hue—7.5YR, 10YR, 2.5Y, 5Y, or N
Value—3 to 7
Chroma—0 to 6
Texture—silty clay loam, silt loam, sandy clay loam, or clay loam

8875B—Lenzlo silty clay loam, 1 to 7 percent slopes, occasionally flooded

Setting

Landform: Graded spoil banks on flood plains (fig. 13)
Position on the landform: Summits and shoulders

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Parent material: Cast overburden from surface mining

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Lenzlo and similar soils: 85 percent
Dissimilar components: 15 percent

Figure 13.—An area of Lenzlo silty clay loam, 1 to 7 percent slopes, occasionally flooded.

Similar soils:
- Soils that have more than 15 rock fragments throughout
- Soils that have flagstones on the surface

Dissimilar components:
- Soils in depressional areas that are frequently ponded
- The poorly drained Beaucoup and somewhat poorly drained Wakeland soils along the borders of the mapped areas

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Lenzwheel Series

Taxonomic classification: Fine-loamy, mixed, active, calcareous, mesic Alfic Udarents

Typical Pedon

Lenzwheel silty clay loam, 20 to 60 percent slopes, 2,600 feet north and 2,165 feet west of the southeast corner of sec. 25, T. 6 N., R. 4 E.

A—0 to 3 inches; silty clay loam, 80 percent brown (10YR 4/3), 15 percent dark yellowish brown (10YR 4/6), and 5 percent brown (10YR 5/3); pale brown (10YR 6/3) dry; weak fine subangular blocky structure; friable; many very fine and fine roots; about 10 percent fine pebbles; neutral; gradual wavy boundary.

AC—3 to 7 inches; silty clay loam, 70 percent brown

(10YR 4/3), 20 percent brown (10YR 5/3), 5 percent yellowish brown (10YR 5/8), and 5 percent light brownish gray (10YR 6/2); weak medium subangular blocky structure; friable; common very fine and fine roots; about 10 percent fine pebbles; very slightly effervescent; slightly alkaline; gradual wavy boundary.

C1—7 to 26 inches; clay loam, 60 percent dark yellowish brown (10YR 4/4), 30 percent brown (10YR 5/3), 5 percent yellowish brown (10YR 5/8), and 5 percent light brownish gray (10YR 6/2); massive; firm; few very fine and fine roots; about 10 percent randomly oriented relict dark yellowish brown (10YR 4/4) silty clay loam peds commonly having clay films and redox concentrations; about 4 percent fine pebbles; slightly effervescent; neutral; gradual wavy boundary.

C2—26 to 44 inches; silty clay loam, 70 percent yellowish brown (10YR 5/4), 15 percent dark yellowish brown (10YR 4/4), 10 percent brown (7.5YR 4/4), and 5 percent yellowish brown (10YR 5/8); pockets of silt loam; massive; friable; few very fine roots; about 10 percent randomly oriented relict dark yellowish brown (10YR 4/4) and dark grayish brown (10YR 4/2) silty clay loam peds commonly having clay films and redox concentrations; less than 1 percent fine pebbles; slightly alkaline; gradual wavy boundary.

C3—44 to 80 inches; silty clay loam, 45 percent dark yellowish brown (10YR 4/4), 45 percent grayish brown (10YR 5/2), 5 percent yellowish brown (10YR 5/8), and 5 percent brown (7.5YR 4/4); massive; firm; few very fine roots; about 5 percent randomly oriented relict dark yellowish brown (10YR 4/4) silty clay loam peds commonly having clay films and redox concentrations; about 2 percent fine and 1 percent medium pebbles; slightly effervescent; slightly alkaline.

Range in Characteristics

A horizon:
Value—4 or 5
Chroma—2 to 6
Texture—silty clay loam or silt loam

C horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—2 to 8
Texture—silty clay loam, clay loam, or silt loam

876B—Lenzwheel silt loam, 1 to 7 percent slopes

Setting

Landform: Graded spoil banks in the uplands
Position on the landform: Summits

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Cast overburden from surface mining

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Lenzwheel and similar soils: 85 percent
Dissimilar components: 15 percent

Similar soils:
- Soils that have more sand in the surface layer and throughout the profile
- Soils that contain more rock fragments throughout
- Soils in gullied areas

Dissimilar components:
- Soils in depressional areas that are frequently ponded

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

876D—Lenzwheel silty clay loam, 7 to 20 percent slopes

Setting

Landform: Graded spoil banks in the uplands
Position on the landform: Shoulders and backslopes

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Cast overburden from surface mining

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Lenzwheel and similar soils: 85 percent
Dissimilar components: 15 percent

Similar soils:
- Soils that have more sand in the surface layer and throughout the profile
- Soils that contain more rock fragments throughout

Dissimilar components:
- Gullies

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

876G—Lenzwheel silty clay loam, 20 to 60 percent slopes

Setting

Landform: Spoil banks in the uplands
Position on the landform: Backslopes

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Cast overburden from surface mining

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Lenzwheel and similar soils: 85 percent
Dissimilar components: 15 percent

Similar soils:
- Soils that have more sand in the surface layer and throughout the profile
- Soils that contain more rock fragments throughout

Dissimilar components:
- Small areas of water (between ridges)

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Littleton Series

Taxonomic classification: Fine-silty, mixed, superactive, mesic Aquic Cumulic Hapludolls

Typical Pedon

Littleton silt loam, 0 to 2 percent slopes, rarely flooded, 2,331 feet east and 1,498 feet north of the southwest corner of sec. 15, T. 6 N., R. 5 E.

Ap—0 to 9 inches; very dark gray (10YR 3/1) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; common very fine roots; moderately acid; clear smooth boundary.

A1—9 to 20 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; moderate fine granular structure; friable; common very fine roots; neutral; gradual smooth boundary

A2—20 to 35 inches; very dark grayish brown (10YR 3/2) silt loam, gray (10YR 5/1) dry; weak very fine and fine subangular blocky structure; friable; few very fine roots; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds and lining root channels and pores; few fine prominent strong brown (7.5YR 4/6) masses of iron accumulation with diffuse boundaries along root channels and pores; neutral; clear smooth boundary.

AB—35 to 46 inches; very dark grayish brown (10YR 3/2) silt loam; moderate fine and medium subangular blocky structure; friable; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds and lining pores; common fine prominent strong brown (7.5YR 4/6) masses of iron accumulation with diffuse boundaries along pores; neutral; clear smooth boundary.

Bw—46 to 58 inches; very dark gray (10YR 3/1) silt loam; moderate medium subangular blocky structure; friable; few distinct very dark gray (10YR 3/1) organic coatings on faces of peds and lining pores; common fine prominent strong brown (7.5YR 4/6) and common fine distinct yellowish brown (10YR 5/8) masses of iron accumulation with diffuse boundaries along pores; neutral; clear smooth boundary.

Bg—58 to 64 inches; grayish brown (2.5Y 5/2) silt loam; weak coarse subangular blocky structure; friable; few distinct very dark gray (10YR 3/1) organic coatings on vertical faces of peds and lining pores; few fine prominent strong brown (7.5YR 4/6) and common fine prominent yellowish brown (10YR 5/8) masses of iron accumulation with diffuse boundaries along pores; neutral; clear smooth boundary.

Cg—64 to 80 inches; dark grayish brown (2.5Y 4/2) and grayish brown (2.5Y 5/2) silt loam; massive; friable; common fine prominent yellowish brown (10YR 5/8) masses of iron accumulation with diffuse boundaries along pores; neutral.

Range in Characteristics

Thickness of the mollic epipedon: 24 to 60 inches
Content of clay in the control section: 22 to 27 percent

Ap or A horizon:
Chroma—1 or 2

Bw horizon:
Hue—10YR or 2.5Y
Value—3 to 5
Chroma—1 to 3

Cg horizon:
Value—4 or 5

7081A—Littleton silt loam, 0 to 2 percent slopes, rarely flooded

Setting

Landform: Alluvial fans
Position on the landform: Footslopes

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Parent material: Stream alluvium

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Littleton and similar soils: 90 percent
Dissimilar components: 10 percent

Similar soils:
- Soils that have a thinner subsurface layer

Dissimilar components:
- The well drained Worthen and Raddle soils in the slightly higher positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Marbletown Series

Taxonomic classification: Fine-loamy, mixed, superactive, mesic Typic Argiudolls

Typical Pedon

Marbletown silt loam, 2 to 5 percent slopes, 2,450 feet south and 1,710 feet west of the northeast corner of sec. 4, T. 3 N., R. 3 E.

Ap—0 to 6 inches; dark brown (10YR 3/3) silt loam, pale brown (10YR 6/3) dry; weak fine granular structure; very friable; few very fine roots; slightly alkaline; abrupt smooth boundary.

A—6 to 14 inches; very dark grayish brown (10YR 3/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine subangular blocky structure; very friable; few very fine roots; slightly alkaline; clear smooth boundary.

Bt1—14 to 25 inches; yellowish brown (10YR 5/4) silt loam; weak fine subangular blocky structure; friable; few very fine roots; common distinct dark brown (10YR 3/3) organic coatings lining root channels and lining pores and few distinct brown (10YR 4/3) clay films on faces of peds; slightly alkaline; clear smooth boundary.

Bt2—25 to 31 inches; dark yellowish brown (10YR 4/4) silt loam; weak medium subangular blocky structure; friable; few very fine roots; few distinct brown (10YR 4/3) clay films on faces of peds; few fine black (10YR 2/1) masses of manganese accumulation with diffuse boundaries in ped interiors; very slightly effervescent; moderately alkaline; clear smooth boundary.

2Bt3—31 to 45 inches; dark yellowish brown (10YR 4/4) loam; weak medium subangular blocky structure; friable; few very fine roots; few distinct brown (10YR 4/3) clay films on faces of peds; about 5 percent fine gravel; few fine black (10YR 2/1) masses of manganese accumulation with diffuse boundaries in ped interiors; slightly effervescent; moderately alkaline; clear smooth boundary.

2BC—45 to 50 inches; dark yellowish brown (10YR 4/4) and brown (10YR 4/3) clay loam; weak coarse subangular blocky structure; friable; common distinct black (10YR 2/1) organic coatings on faces of peds and lining pores; about 10 percent gravel; slightly effervescent; moderately alkaline; abrupt smooth boundary.

3Cr—50 to 60 inches; weathered sandstone.

Range in Characteristics

Depth to paralithic contact in sandstone: 40 to 60 inches
Content of clay in the control section: 18 to 24 percent

Ap and A horizons:
Chroma—2 or 3

Bt horizon:
Value—4 or 5

2BC horizon:
Chroma—3 or 4
Texture—loam or clay loam

596B—Marbletown silt loam, 2 to 5 percent slopes

Setting

Landform: Alluvial fans
Position on the landform: Footslopes

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Slope alluvium

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Marbletown and similar soils: 95 percent
Dissimilar components: 5 percent

Dissimilar components:
- Raddle and Worthen soils in positions on the landform upslope from those of the Marbletown soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Marseilles Series

Taxonomic classification: Fine-silty, mixed, superactive, mesic Typic Hapludalfs
Taxadjunct features: The Marseilles soil in map unit 549G does not have an argillic horizon, which is definitive for the series. This soil is classified as a fine-silty, mixed, superactive, mesic Typic Dystrudept.

Typical Pedon

Marseilles silt loam, 18 to 35 percent slopes, 420 feet north and 1,560 feet east of the center of sec. 13, T. 5 N., R. 1 E.

A—0 to 5 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; many very fine and common fine roots; moderately acid; clear smooth boundary.

E—5 to 9 inches; brown (10YR 4/3) silt loam; weak medium platy structure; friable; many very fine and common fine roots; common distinct very dark grayish brown (10YR 3/2) root channel fillings; moderately acid; clear smooth boundary.

Bt1—9 to 16 inches; brown (10YR 5/3) silty clay loam; moderate fine and medium subangular blocky structure; firm; common very fine and fine roots; common distinct very dark grayish brown (10YR 3/2) root channel fillings, one of which is large (1.5 inches in diameter), and few distinct brown (10YR 4/3) clay films on faces of peds and lining pores; about 3 percent channers of shale; very strongly acid; clear smooth boundary.

Bt2—16 to 21 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine and medium subangular blocky structure; firm; common very fine and fine roots; common distinct very dark grayish brown (10YR 3/2) root channel fillings and few distinct brown (10YR 4/3) clay films on faces of peds and lining pores; few fine distinct strong brown (7.5YR 4/6) masses of iron accumulation with diffuse boundaries along root channels; about 3 percent channers of shale; very strongly acid; clear smooth boundary.

Bt3—21 to 29 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; firm; few very fine and fine roots; common distinct very dark grayish brown (10YR 3/2) root channel fillings and few distinct brown (10YR 4/3) clay films on faces of peds and lining pores; few fine distinct strong brown (7.5YR 4/6) and brownish yellow (10YR 6/8) masses of iron accumulation with diffuse boundaries surrounding few fine distinct light brownish gray (10YR 6/2) iron depletions along root channels and pores; about 3 percent channers of shale; very strongly acid; clear smooth boundary.

2Bt4—29 to 37 inches; silty clay, 60 percent light brownish gray (10YR 6/2) and 40 percent red (2.5YR 4/8); moderate medium subangular blocky structure; firm; few very fine roots; few distinct brown (10YR 4/3) clay films lining root channels and pores and few distinct brown (10YR 5/3) clay films on faces of peds; very strongly acid; clear smooth boundary.

2BC—37 to 43 inches; silty clay loam, 70 percent light brownish gray (10YR 6/2) and 30 percent red (2.5YR 4/8); weak medium and coarse subangular blocky structure; firm; few very fine roots; few distinct brown (10YR 4/3) clay films lining pores; very strongly acid; abrupt smooth boundary.

2Cr—43 to 60 inches; light gray (10YR 6/1) and red (2.5YR 4/8) clay shale with weathered sandstone.

Range in Characteristics

Depth to paralithic contact in shale: 20 to 40 inches
Content of clay in the control section: 24 to 35 percent

A horizon:
Value—2 to 4
Chroma—2 or 3

Bt horizon:
Value—4 or 5
Chroma—3 to 6

2Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 4
Texture—silty clay loam, clay loam, or silty clay

2Cr horizon:
Hue—10YR, 2.5Y, or N
Value—4 to 6
Chroma—0 to 4

549F—Marseilles silt loam, 18 to 35 percent slopes

Setting

Landform: Side slopes along upland drainageways
Position on the landform: Backslopes

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Loess and the underlying residuum

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Marseilles and similar soils: 90 percent
Dissimilar components: 10 percent

Similar soils:
- Soils that have more clay in the surface layer and subsoil
- Soils that have shale bedrock at a depth of more than 40 inches
- Soils that have sandstone bedrock

Dissimilar components:
- The well drained Seaton and Hickory soils in positions on the landform upslope from those of the Marseilles soil
- The somewhat poorly drained Wakeland and moderately well drained Wilbur soils on narrow flood plains downslope from the Marseilles soil
- Areas of bedrock escarpment

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

549G—Marseilles silt loam, 35 to 60 percent slopes

Setting

Landform: Side slopes along upland drainageways
Position on the landform: Backslopes

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Loess and the underlying residuum

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Marseilles and similar soils: 90 percent
Dissimilar components: 10 percent

Similar soils:
- Soils that have more clay in the surface layer and subsurface layer
- Soils that have sandstone bedrock

Dissimilar components:
- The well drained Seaton and Hickory soils in positions on the landform upslope from those of the Marseilles soil
- The somewhat poorly drained Wakeland and moderately well drained Wilbur soils on narrow flood plains downslope from the Marseilles soil

• Areas of bedrock escarpment

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Martinsville Series

Taxonomic classification: Fine-loamy, mixed, active, mesic Typic Hapludalfs

Typical Pedon

Martinsville loam, 2 to 5 percent slopes, 2,300 feet west and 460 feet north of the southeast corner of sec. 33, T. 4 N., R. 3 E.

Ap—0 to 7 inches; brown (10YR 4/3) loam, brown (10YR 5/3) dry; weak fine granular structure; friable; few very fine roots; slightly acid; clear smooth boundary.

BE—7 to 11 inches; brown (10YR 4/3) loam; weak fine subangular blocky structure; friable; few very fine roots; few distinct dark brown (10YR 3/3) organic coatings on faces of peds; slightly acid; clear smooth boundary.

Bt1—11 to 18 inches; dark yellowish brown (10YR 4/4) clay loam; weak fine and medium subangular blocky structure; friable; few very fine roots; few distinct dark brown (10YR 3/3) clay films on faces of peds; neutral; gradual smooth boundary.

Bt2—18 to 28 inches; dark yellowish brown (10YR 4/4) clay loam; weak medium prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; dark brown (10YR 3/3) krotovina; slightly acid; gradual smooth boundary.

Bt3—28 to 37 inches; dark yellowish brown (10YR 4/4) clay loam; weak medium prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots; few distinct brown (10YR 4/3) clay films on faces of peds; slightly acid; gradual smooth boundary.

Bt4—37 to 53 inches; dark yellowish brown (10YR 4/4), stratified loam and sandy loam; weak medium subangular blocky structure; friable; few very fine roots; few distinct brown (10YR 4/3) clay films on faces of peds; slightly acid; gradual smooth boundary.

BC—53 to 60 inches; dark yellowish brown (10YR 4/4), stratified sandy loam and loam; weak medium subangular blocky structure; very friable; few very fine roots; neutral.

Range in Characteristics

Content of clay in the control section: 22 to 33 percent

Bt horizon:
Chroma—3 or 4
Texture—clay loam or stratified loam and sandy loam

570B—Martinsville loam, 2 to 5 percent slopes

Setting

Landform: Stream terraces
Position on the landform: Summits and shoulders

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Outwash

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Martinsville and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
• Soils that have more sand or less sand in the lower part of the subsoil
• Soils that have slopes of more than 5 percent

Dissimilar components:
• The well drained Raddle and Worthen soils in positions on the landform upslope from those of the Martinsville soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Mudhen Series

Taxonomic classification: Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Typic Endoaquolls

Typical Pedon

Mudhen clay loam, 0 to 2 percent slopes, occasionally flooded; 1,998 feet east and 333 feet south of the northwest corner of sec. 34, T. 6 N., R. 5 E.

Ap—0 to 9 inches; very dark gray (10YR 3/1) clay loam, dark gray (10YR 4/1) dry; weak fine granular structure; firm; common very fine roots; slightly acid; clear smooth boundary.

A—9 to 12 inches; very dark gray (10YR 3/1) clay loam, dark gray (10YR 4/1) dry; weak fine subangular blocky structure; firm; few very fine roots; about 1 percent fine gravel; few fine distinct dark yellowish brown (10YR 4/6) masses of iron accumulation with diffuse boundaries lining ped surfaces and pores; neutral; clear smooth boundary.

Bg1—12 to 17 inches; dark grayish brown (2.5Y 4/2) clay loam; moderate fine and medium subangular blocky structure; firm; few very fine roots; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds and lining pores; about 3 percent fine gravel; common fine distinct dark yellowish brown (10YR 4/6) masses of iron accumulation with diffuse boundaries lining ped surfaces and pores; neutral; clear smooth boundary.

Bg2—17 to 23 inches; dark grayish brown (2.5Y 4/2) clay loam; moderate medium subangular blocky structure; firm; few very fine roots; few distinct very dark gray (10YR 3/1) organic coatings on vertical faces of peds and lining pores; common fine distinct dark yellowish brown (10YR 4/6) masses of iron accumulation with diffuse boundaries lining ped surfaces and pores; about 5 percent fine and medium gravel and 1 percent coarse gravel; neutral; clear smooth boundary.

2Bg3—23 to 28 inches; dark grayish brown (2.5Y 4/2) gravelly clay loam; weak coarse subangular blocky structure; firm; few distinct very dark gray (10YR 3/1) organic coatings lining pores; about 15 percent fine and medium gravel and 1 percent coarse gravel; few fine distinct dark yellowish brown (10YR 4/6) masses of iron accumulation with diffuse boundaries lining ped surfaces and pores; slightly effervescent; slightly alkaline; clear smooth boundary.

2C—28 to 41 inches; brown (10YR 5/3) and yellowish brown (10YR 5/4) gravelly loamy coarse sand; single grain; loose; about 25 percent fine and medium gravel and 5 percent coarse gravel; strongly effervescent; slightly alkaline; abrupt smooth boundary.

3Cr—41 to 60 inches; clay shale, 60 percent light gray (N 6/0) and light brownish gray (2.5Y 6/2) and 40 percent light olive brown (2.5Y 5/4); massive with horizontal cleavage planes; very firm; few fine distinct dark brown (7.5YR 3/2) masses of iron accumulation and black (10YR 2/1) masses of manganese accumulation lining pores and cleavage planes; strongly effervescent; slightly alkaline.

Range in Characteristics

Depth to paralithic contact in shale: 40 to 60 inches
Content of clay in the control section: 25 to 33 percent

2C horizon:
Chroma—3 or 4

3Cr horizon:
Hue—2.5Y or N
Value—5 or 6
Chroma—0 to 4

8608A—Mudhen clay loam, 0 to 2 percent slopes, occasionally flooded

Setting

Landform: Strath terraces
Position on the landform: Low-lying areas

Soil Properties and Qualities

Drainage class: Poorly drained
Parent material: Outwash

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Mudhen and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
• Soils that have more rock fragments in the surface layer

Dissimilar components:
• The somewhat poorly drained Coot soils in the higher positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Navlys Series

Taxonomic classification: Fine-silty, mixed, superactive, mesic Typic Hapludalfs

Typical Pedon

Navlys silty clay loam, 5 to 10 percent slopes, severely eroded, 1,411 feet south and 255 feet east of the northwest corner of sec. 11, T. 4 N., R. 2 E.

Ap—0 to 6 inches; silty clay loam, 70 percent dark grayish brown (10YR 4/2) and 30 percent yellowish brown (10YR 5/4); pale brown (10YR 6/3) dry; moderate fine subangular blocky structure parting to weak fine granular; friable; common very fine roots; moderately acid; clear smooth boundary.

Bt1—6 to 15 inches; yellowish brown (10YR 5/4) silty clay loam; strong fine and medium subangular blocky structure; firm; common very fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation with diffuse boundaries in ped interiors; moderately acid; gradual smooth boundary.

Bt2—15 to 22 inches; silty clay loam, 90 percent yellowish brown (10YR 5/4) and 10 percent light brownish gray (10YR 6/2); strong medium prismatic structure; firm; common very fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; many fine distinct yellowish brown (10YR 5/6) masses of iron accumulation with diffuse boundaries in ped interiors; moderately acid; gradual smooth boundary.

Bt3—22 to 31 inches; yellowish brown (10YR 5/4) and light brownish gray (10YR 6/2) silty clay loam; moderate medium prismatic structure; firm; few very fine roots; few distinct dark grayish brown (10YR 4/2) clay films lining root channels and pores; many fine distinct yellowish brown (10YR 5/6) masses of iron accumulation with diffuse boundaries and few fine black (10YR 2/1) manganese concretions with sharp boundaries in ped interiors; slightly effervescent; neutral; gradual smooth boundary.

C1—31 to 56 inches; yellowish brown (10YR 5/4) and light brownish gray (10YR 6/2) silt loam; massive; friable; few very fine roots; few distinct dark grayish brown (10YR 4/2) clay films lining root channels and pores; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation with diffuse boundaries and few fine black (10YR 2/1) manganese concretions with sharp boundaries throughout; slightly effervescent; moderately alkaline; gradual smooth boundary.

C2—56 to 60 inches; light brownish gray (10YR 6/2) silt loam; common fine distinct light yellowish brown (10YR 6/4) masses of iron accumulation with diffuse boundaries and few fine black (10YR 2/1) manganese concretions with sharp boundaries throughout; slightly effervescent; neutral.

Range in Characteristics

Depth to carbonates: 22 to 40 inches
Content of clay in the control section: 25 to 35 percent

Ap horizon:
Value—4 or 5
Chroma—2 to 4

Bt horizon:
Value—5 or 6
Chroma—2 to 4
Texture—silty clay loam or silt loam

C horizon:
Value—5 or 6
Chroma—2 to 4
Texture—silt loam

630C3—Navlys silty clay loam, 5 to 10 percent slopes, severely eroded

Setting

Landform: Side slopes along upland drainageways
Position on the landform: Shoulders

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Loess

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Navlys and similar soils: 100 percent

Similar soils:
- Soils that have a surface layer of silt loam
- Soils that have a solum more than 40 inches thick
- Soils that have gray colors at a depth of less than 42 inches

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Onarga Series

Taxonomic classification: Coarse-loamy, mixed, superactive, mesic Typic Argiudolls

Typical Pedon

Onarga fine sandy loam, 2 to 5 percent slopes, 335 feet east and 2,640 feet south of the northwest corner of sec. 14, T. 3 N., R. 3 E.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) fine sandy loam, grayish brown (10YR 5/2) dry; weak fine granular structure; very friable; few very fine roots; neutral; abrupt smooth boundary.

A1—9 to 12 inches; very dark grayish brown (10YR 3/2) fine sandy loam, grayish brown (10YR 5/2) dry; moderate medium granular structure; very friable; few very fine roots; neutral; clear smooth boundary.

A2—12 to 17 inches; dark brown (10YR 3/3) fine sandy loam, brown (10YR 5/3) dry; moderate very fine subangular blocky structure; very friable; few very fine roots; many distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds and lining root channels and pores; neutral; clear smooth boundary.

BA—17 to 22 inches; dark brown (10YR 3/3) fine sandy loam, brown (10YR 5/3) dry; moderate fine subangular blocky structure; friable; few very fine roots; common distinct very dark grayish brown (10YR 3/2) organic coatings lining root channels and pores; neutral; clear smooth boundary.

Bt1—22 to 29 inches; brown (10YR 4/3) fine sandy loam; moderate medium subangular blocky structure; friable; few very fine roots; common distinct dark brown (10YR 3/3) clay films on faces of peds and few distinct very dark grayish brown (10YR 3/2) organic coatings lining root channels and pores; neutral; clear smooth boundary.

Bt2—29 to 36 inches; dark yellowish brown (10YR 4/4) fine sandy loam; moderate medium subangular blocky structure; friable; few very fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; neutral; clear smooth boundary.

BCt—36 to 45 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak coarse subangular blocky structure; friable; few distinct brown (10YR 4/3) clay films on faces of peds; neutral; clear smooth boundary.

C1—45 to 54 inches; dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/4), stratified fine sand and loamy fine sand; single grain; loose; neutral; clear smooth boundary.

C2—54 to 73 inches; yellowish brown (10YR 5/4 and 5/6), stratified fine sand and loamy fine sand; single grain; loose; neutral.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches
Content of clay in the control section: 15 to 18 percent

Ap or A horizon:
Chroma—2 or 3

Bt horizon:
Chroma—3 or 4

C horizon:
Value—4 or 5
Chroma—3 to 6
Texture—stratified loamy fine sand and fine sand

150B—Onarga fine sandy loam, 2 to 5 percent slopes

Setting

Landform: Ridges on stream terraces
Position on the landform: Summits

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Eolian deposits and the underlying outwash

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Onarga and similar soils: 90 percent
Dissimilar components: 10 percent

Similar soils:
- Soils that have gray colors at a depth of less than 60 inches

Dissimilar components:
• The somewhat poorly drained La Hogue soils in the less sloping positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Orion Series

Taxonomic classification: Coarse-silty, mixed, superactive, nonacid, mesic Aquic Udifluvents

Typical Pedon

Orion silt loam, 0 to 2 percent slopes, occasionally flooded, 2,210 feet north and 980 feet east of the southwest corner of sec. 22, T. 5 N., R. 4 E.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine subangular blocky structure parting to weak fine granular; friable; many very fine and fine roots; neutral; abrupt smooth boundary.

C—6 to 25 inches; dark grayish brown (10YR 4/2) silt loam with lenses of grayish brown (10YR 5/2); weak fine and medium subangular blocky structure; many very fine and fine roots; common distinct dark brown (10YR 3/3) organic coatings lining root channels and pores; few fine distinct strong brown (7.5YR 4/6) masses of iron accumulation with diffuse boundaries along ped surfaces; neutral; clear smooth boundary.

Ab1—25 to 32 inches; very dark gray (10YR 3/1) silt loam; moderate fine and medium subangular blocky structure; friable; common very fine roots; neutral; clear smooth boundary.

Ab2—32 to 40 inches; very dark grayish brown (10YR 3/2) silty clay loam; moderate medium and coarse subangular blocky structure; firm; few very fine roots; neutral; clear smooth boundary.

C´—40 to 60 inches; dark grayish brown (2.5Y 4/2) silty clay loam; massive; firm; few fine distinct strong brown (7.5YR 5/6) masses of iron accumulation with diffuse boundaries throughout; slightly alkaline.

Range in Characteristics

Depth to the dark buried soil: 20 to 40 inches

Content of clay in the control section: 10 to 18 percent

Ap horizon:
Chroma—1 or 2

C horizon:
Value—4 or 5

Ab horizon:
Chroma—1 or 2
Texture—silt loam or silty clay loam

C´ horizon:
Value—4 or 5
Chroma—2 to 4
Texture—silty clay loam or loam

3415A—Orion silt loam, 0 to 2 percent slopes, frequently flooded

Setting

Landform: Rises on flood plains
Position on the landform: Summits

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Parent material: Stream alluvium

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Orion and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
• Soils that have a buried dark surface soil at a depth of more than 60 inches

Dissimilar components:
• The somewhat poorly drained Tice soils in the slightly lower positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

8415A—Orion silt loam, 0 to 2 percent slopes, occasionally flooded

Setting

Landform: Rises on flood plains
Position on the landform: Summits

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Parent material: Stream alluvium

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Orion and similar soils: 90 percent
Dissimilar components: 10 percent

Similar soils:
- Soils that have more sand in the substratum
- Soils that have a buried soil at a depth of more than 40 inches

Dissimilar components:
- The somewhat poorly drained Tice and poorly drained Beaucoup soils in the lower positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

801B—Orthents, silty, undulating

Setting

Landform: Uplands
Position on the landform: Variable

Component Description

- This map unit consists of areas that have been disturbed by cutting and filling.

Soil Properties and Qualities

Drainage class: Somewhat poorly drained to well drained
Parent material: Loess or other silty material

Composition

Orthents and similar soils: 85 percent
Dissimilar components: 15 percent

Similar soils:
- Soils that are underlain by till or shale

Dissimilar components:
- Areas that have slopes of more than 7 percent
- Escarpments associated with cut and fill areas
- Private roads

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Engineering” section
- “Soil Properties” section

Osco Series

Taxonomic classification: Fine-silty, mixed, superactive, mesic Typic Argiudolls
Taxadjunct features: The Osco soil in map unit 86C2 has a thinner dark surface layer than is defined as the range for the series. This soil is classified as a fine-silty, mixed, superactive, mesic Mollic Hapludalf.

Typical Pedon

Osco silt loam, 2 to 5 percent slopes, 1,440 feet south and 300 feet west of the northeast corner of sec. 17, T. 7 N., R. 1 E.

Ap—0 to 7 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; weak very fine granular structure; friable; few very fine roots; neutral; abrupt smooth boundary.
A—7 to 12 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; weak very fine subangular blocky structure parting to moderate very fine granular; friable; few very fine roots; neutral; clear smooth boundary.
BA—12 to 16 inches; brown (10YR 4/3) silty clay loam; moderate very fine subangular blocky structure; friable; few very fine roots; many distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds and lining pores; neutral; clear smooth boundary.
Bt1—16 to 23 inches; brown (10YR 5/3) silty clay loam; moderate fine subangular blocky structure; friable; few very fine roots; common distinct dark brown (10YR 3/3) clay films on faces of peds and few distinct very dark grayish brown (10YR 3/2)

organic coatings on faces of peds and lining pores; slightly acid; clear smooth boundary.
Bt2—23 to 36 inches; brown (10YR 5/3) silty clay loam; moderate medium subangular blocky structure; friable; few very fine roots; many fine faint yellowish brown (10YR 5/4) masses of iron accumulation and black (10YR 2/1) masses of manganese accumulation with diffuse boundaries in ped interiors; common fine faint grayish brown (10YR 5/2) iron depletions along pores; moderately acid; clear smooth boundary.
BC—36 to 47 inches; brown (10YR 5/3) silt loam; weak coarse subangular blocky structure; friable; few distinct dark grayish brown (10YR 4/2) clay films lining pores; many medium distinct yellowish brown (10YR 5/6) masses of iron accumulation and black (10YR 2/1) masses of manganese accumulation with diffuse boundaries in ped interiors; common fine faint pale brown (10YR 6/2) iron depletions along pores; slightly acid; gradual smooth boundary.
Cg—47 to 60 inches; light brownish gray (10YR 6/2) silt loam; massive; friable; common medium distinct yellowish brown (10YR 5/6) and few fine distinct yellowish brown (10YR 5/4) masses of iron accumulation with diffuse boundaries throughout; neutral.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 18 inches
Content of clay in the control section: 27 to 35 percent

86B—Osco silt loam, 2 to 5 percent slopes

Setting

Landform: Knolls and side slopes along drainageways
Position on the landform: Summits and shoulders

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Loess

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Osco and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
- Soils that have a thinner surface layer
- Soils that have carbonates at a depth of less than 40 inches

Dissimilar components:
- The poorly drained Sable soils in low-lying areas that are subject to ponding
- The somewhat poorly drained Ipava soils in the less sloping positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

86C2—Osco silt loam, 5 to 10 percent slopes, eroded

Setting

Landform: Knolls, head slopes, and side slopes along upland drainageways
Position on the landform: Shoulders

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Loess
Other properties: This soil has a thinner surface layer than the Osco soil in map unit 86B.

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Osco and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
- Soils that have carbonates at a depth of less than 40 inches
- Soils that have a thicker surface layer
- Soils that have a surface layer of silty clay loam

Dissimilar components:
- The somewhat poorly drained Ipava soils in the less sloping positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Wildlife Habitat” section
- “Engineering” section

• “Soil Properties” section

865—Pits, gravel

Setting

Landform: Uplands
Position on the landform: Variable

Component Description

• This map unit consists of open excavations from which sand and gravel have been or are being removed and includes the piles of sand and gravel and other spoil material surrounding the excavations.
• Soil properties are variable. Onsite investigation is needed to determine the properties in specific areas.

Composition

Pits, gravel: 95 percent
Other components: 5 percent

Other components:
• Quarry company roads, stockpiles of gravel, sparsely vegetated spoil material, and abandoned excavations

Plano Series

Taxonomic classification: Fine-silty, mixed, superactive, mesic Typic Argiudolls
Taxadjunct features: The Plano soils in this survey area have redoximorphic features higher in the profile than is defined as the range for the series. These soils are classified as fine-silty, mixed, superactive, mesic Oxyaquic Argiudolls.

Typical Pedon

Plano silt loam, 2 to 5 percent slopes, 2,160 feet west and 2,120 feet north of the southeast corner of sec. 15, T. 4 N., R. 3 E.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; very friable; common very fine roots; neutral; abrupt smooth boundary.
A—9 to 12 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; very friable; common very fine roots; moderately acid; abrupt smooth boundary.
AB—12 to 17 inches; silt loam, 80 percent dark brown (10YR 3/3) and 20 percent brown (10YR 4/3); weak fine subangular blocky structure; friable; few very fine roots; common distinct dark brown (10YR 3/3) organic coatings on faces of peds and lining pores; slightly acid; abrupt smooth boundary.
Bt1—17 to 27 inches; brown (10YR 4/3) silty clay loam; moderate fine subangular blocky structure; friable; common distinct dark brown (10YR 3/3) clay films on faces of peds and lining pores; few fine black (10YR 2/1) masses of manganese accumulation with diffuse boundaries in ped interiors; moderately acid; clear smooth boundary.
Bt2—27 to 40 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine subangular blocky structure; firm; many distinct brown (10YR 4/3) clay films on faces of peds and lining pores; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation and few fine black (10YR 2/1) masses of manganese accumulation with diffuse boundaries in ped interiors; about 1 percent fine gravel; moderately acid; clear smooth boundary.
Bt3—40 to 53 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium subangular blocky structure; firm; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds and lining pores; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation and few fine black (10YR 2/1) masses of manganese accumulation with diffuse boundaries in ped interiors; about 2 percent fine gravel; moderately acid; clear smooth boundary.
2BC—53 to 66 inches; yellowish brown (10YR 5/4), stratified silt loam, loam, and sandy loam; weak coarse subangular blocky structure; friable; few distinct dark grayish brown (10YR 4/2) clay films on faces of peds and lining pores; common fine distinct yellowish brown (10YR 5/6 and 5/8) masses of iron accumulation and few fine black (10YR 2/1) masses of manganese accumulation with diffuse boundaries in ped interiors; common fine distinct grayish brown (10YR 5/2) iron depletions along pores; about 2 percent fine gravel; slightly acid; clear smooth boundary.
2C—66 to 70 inches; yellowish brown (10YR 5/4), stratified silt loam and sandy loam; massive; friable; common fine distinct yellowish brown (10YR 5/6 and 5/8) masses of iron accumulation and few fine black (10YR 2/1) masses of manganese accumulation with diffuse boundaries throughout; common fine distinct grayish brown (10YR 5/2) iron depletions along pores; about 2 percent fine gravel; slightly acid.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Thickness of the loess: 40 to 60 inches

Content of clay in the control section: 27 to 35 percent

199B—Plano silt loam, 2 to 5 percent slopes

Setting

Landform: Ridges on stream terraces
Position on the landform: Summits

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Loess or other silty material and the underlying outwash

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Plano and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
• Soils that have less sand in the lower part of the subsoil

Dissimilar components:
• The somewhat poorly drained Elburn soils in the lower positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

• “Agronomy” section
• “Wildlife Habitat” section
• “Engineering” section
• “Soil Properties” section

Quiver Series

Taxonomic classification: Fine-silty, mixed, superactive, nonacid, mesic Mollic Fluvaquents

Typical Pedon

Quiver silty clay loam, 0 to 2 percent slopes, frequently flooded, long duration, 1,990 feet north and 1,490 feet east of the southwest corner of sec. 24, T. 6 N., R. 5 E.

Cg1—0 to 9 inches; very dark gray (2.5Y 3/1) silty clay loam with fine strata of dark grayish brown (2.5Y 4/2) silty clay loam; grayish brown (10YR 5/2) dry; weak fine subangular blocky structure; firm; many very fine roots; few fine prominent reddish brown (5YR 4/4) masses of iron accumulation and few fine black (10YR 2/1) masses of manganese accumulation with diffuse boundaries lining pores and root channels; neutral; clear smooth boundary.

Cg2—9 to 14 inches; dark gray (2.5Y 4/1) silty clay loam with fine strata of dark grayish brown (2.5Y 4/2) silty clay loam; grayish brown (10YR 5/2) dry; weak fine and medium subangular blocky structure; firm; many very fine roots; common fine prominent reddish brown (5YR 4/4) masses of iron accumulation and few fine black (10YR 2/1) masses of manganese accumulation with diffuse boundaries lining pores and root channels; slightly alkaline; clear smooth boundary.

Cg3—14 to 25 inches; dark gray (2.5Y 4/1) silty clay loam; massive; firm; common very fine roots; many distinct very dark grayish brown (10YR 3/2) organic coatings lining pores; common fine prominent reddish brown (5YR 4/4) masses of iron accumulation and few fine black (10YR 2/1) masses of manganese accumulation with diffuse boundaries lining pores and root channels; slightly alkaline; clear smooth boundary.

Cg4—25 to 34 inches; very dark gray (5Y 3/1) silty clay loam; massive with thin bedding planes; firm; few very fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings lining pores; common fine prominent reddish brown (5YR 4/4) masses of iron accumulation and few fine black (10YR 2/1) masses of manganese accumulation with diffuse boundaries lining pores and root channels; slightly alkaline; clear smooth boundary.

Cg5—34 to 45 inches; dark gray (5Y 4/1) silty clay loam; massive with thin bedding planes; firm; few distinct very dark grayish brown (10YR 3/2) organic coatings lining pores; many fine prominent dark red (2.5YR 3/6) masses of iron accumulation and few fine black (10YR 2/1) masses of manganese accumulation with diffuse boundaries lining pores; slightly alkaline; clear smooth boundary.

Cg6—45 to 65 inches; dark grayish brown (2.5Y 4/2) silty clay loam; massive; firm; many medium prominent dark red (2.5YR 3/6) masses of iron accumulation with diffuse boundaries lining pores; slightly alkaline.

Range in Characteristics

Content of clay in the control section: 24 to 35 percent

Cg horizons:
Hue—10YR, 2.5Y, 5Y, or N
Value—2 to 6
Chroma—0 to 2

3641L—Quiver silty clay loam, 0 to 2 percent slopes, frequently flooded, long duration

Setting

Landform: Flood plains
Position on the landform: Low-lying areas

Soil Properties and Qualities

Drainage class: Very poorly drained
Parent material: Stream alluvium

Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Quiver and similar soils: 90 percent
Dissimilar components: 10 percent

Similar soils:
- Soils that have more clay throughout

Dissimilar components:
- The somewhat poorly drained Wakeland soils in the higher positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Forestland" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Raddle Series

Taxonomic classification: Fine-silty, mixed, superactive, mesic Typic Hapludolls

Typical Pedon

Raddle silt loam, 2 to 5 percent slopes, 570 feet south and 1,890 feet west of the northeast corner of sec. 11, T. 4 N., R. 5 E.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) silt loam, dark grayish brown (10YR 4/2) dry; weak fine granular structure; friable; few very fine roots; slightly acid; clear smooth boundary.

AB—9 to 13 inches; dark brown (10YR 3/3) silt loam, brown (10YR 5/3) dry; weak medium subangular blocky structure; friable; common distinct grayish brown (10YR 3/2) organic coatings on faces of peds; moderately acid; clear smooth boundary.

Bw1—13 to 26 inches; brown (10YR 4/3) silt loam; moderate medium subangular blocky structure; friable; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few fine black (10YR 2/1) manganese concretions with sharp boundaries in ped interiors; slightly acid; gradual smooth boundary.

Bw2—26 to 39 inches; brown (10YR 4/3) silt loam; weak medium prismatic structure parting to moderate medium subangular blocky; friable; few distinct dark brown (10YR 3/3) organic coatings on faces of peds; few fine black (10YR 2/1) manganese concretions with sharp boundaries in ped interiors; slightly acid; gradual smooth boundary.

Bw3—39 to 47 inches; dark yellowish brown (10YR 4/4) silt loam; weak medium prismatic structure parting to weak medium subangular blocky; friable; very few distinct brown (10YR 4/3) coatings on faces of peds; few fine black (10YR 2/1) manganese concretions with sharp boundaries in ped interiors; moderately acid; gradual smooth boundary.

BC—47 to 60 inches; dark yellowish brown (10YR 4/4) silt loam; weak medium prismatic structure; friable; few fine black (10YR 2/1) manganese concretions with sharp boundaries in ped interiors; moderately acid; gradual smooth boundary.

C—60 to 80 inches; sandy loam, 98 percent dark yellowish brown (10YR 4/4) and 2 percent brown (10YR 5/3); massive; very friable; moderately acid.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 18 inches
Content of clay in the control section: 18 to 24 percent

Bw horizon:
Value—4 or 5
Chroma—3 or 4

430B—Raddle silt loam, 2 to 5 percent slopes

Setting

Landform: Alluvial fans
Position on the landform: Footslopes

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Slope alluvium

Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Raddle and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
- Soils that have more sand throughout
- Soils that have a dark surface layer more than 24 inches thick

Dissimilar components:
- The somewhat poorly drained Littleton, Orion, and Tice soils, which are subject to flooding; in positions on the landform downslope from those of the Raddle soil
- Soils that have more sand throughout than the Raddle soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Radford Series

Taxonomic classification: Fine-silty, mixed, superactive, mesic Fluvaquentic Hapludolls

Typical Pedon

Radford silt loam, 0 to 2 percent slopes, frequently flooded, 320 feet east and 1,700 feet south of the northwest corner of sec. 35, T. 4 N., R. 4 W., in McDonough County:

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) silt loam, brown (10YR 5/3) dry; moderate fine and medium granular structure; friable; common very fine roots; few distinct light brownish gray (10YR 6/2 dry) silt coatings on faces of peds; few fine black (10YR 2/1) masses of manganese accumulation throughout; slightly acid; clear smooth boundary.

A—7 to 15 inches; very dark grayish brown (10YR 3/2) silt loam, brown (10YR 5/3) dry; moderate fine and medium granular structure; friable; common very fine roots; very few distinct light brownish gray (10YR 6/2 dry) silt coatings on faces of peds; few fine black (10YR 2/1) masses of manganese accumulation throughout; slightly acid; clear smooth boundary.

C—15 to 24 inches; very dark grayish brown (10YR 3/2) silt loam with thin strata of grayish brown (10YR 5/2) and brown (10YR 5/3) sandy loam; massive with depositional planes of weakness; friable; common very fine roots; few fine black (10YR 2/1) masses of manganese accumulation throughout; common fine prominent yellowish brown (10YR 5/6) iron accumulations with diffuse boundaries throughout; neutral; abrupt smooth boundary.

Ab1—24 to 34 inches; very dark gray (10YR 3/1) silty clay loam; moderate fine subangular blocky structure parting to moderate fine granular; firm; many distinct very dark gray (10YR 3/1) organo-clay films on faces of peds; few fine concretions (iron and manganese oxides); few fine prominent grayish brown (2.5Y 5/2) iron depletions; about 1 percent pebbles; neutral; clear smooth boundary.

Ab2—34 to 48 inches; very dark gray (10YR 3/1) silty clay loam; weak medium prismatic structure parting to moderate fine and medium subangular blocky; firm; few very fine roots; many distinct very dark gray (10YR 3/1) organo-clay films on faces of peds; few fine and medium concretions (iron and manganese oxides); few fine prominent grayish brown (10YR 5/2) and light brownish gray (10YR 6/2) iron depletions; about 1 percent pebbles; neutral; clear smooth boundary.

Ab3—48 to 60 inches; very dark gray (10YR 3/1) silty clay loam; moderate medium subangular blocky structure; firm; common distinct very dark gray (10YR 3/1) organo-clay films on faces of peds; few fine concretions (iron and manganese oxides); few fine prominent grayish brown (2.5Y 5/2) iron depletions and yellowish brown (10YR 5/8) iron accumulations; about 1 percent pebbles; neutral.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches
Content of clay in the control section: 22 to 35 percent

Ap and A horizons:
Value—2 or 3
Chroma—1 or 2

C horizon:
Value—2 to 6
Chroma—1 or 2 (2 to 4 in thin strata)

Ab horizon:
Value—2 or 3
Texture—silty clay loam, clay loam, loam, or silt loam

3074A—Radford silt loam, 0 to 2 percent slopes, frequently flooded

Setting

Landform: Flood plains
Position on the landform: Low-lying areas

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Parent material: Stream alluvium

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Radford and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
- Soils that have a lighter colored surface layer

Dissimilar components:
- The poorly drained Sawmill soils in the slightly lower positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Rapatee Series

Taxonomic classification: Fine-silty, mixed, superactive, nonacid, mesic Alfic Udarents

Typical Pedon

Rapatee silty clay loam, 2 to 5 percent slopes, 2,112 feet south and 990 feet east of the northwest corner of sec. 11, T. 8 N., R. 3 E.

Ap—0 to 5 inches; black (10YR 2/1) silty clay loam, gray (10YR 5/1) dry; moderate medium granular structure; friable; common very fine roots; slightly acid; abrupt smooth boundary.

C1—5 to 15 inches; 95 percent black (10YR 2/1) silty clay loam, 5 percent dark grayish brown (2.5Y 4/2) angular soil fragments; gray (10YR 5/1) dry; massive; friable; common very fine and fine roots; few fine distinct dark yellowish brown (10YR 4/6) masses of iron accumulation with diffuse boundaries along pores within soil fragments; slightly effervescent in soil fragments; neutral; clear smooth boundary.

C2—15 to 26 inches; 90 percent black (10YR 2/1) silty clay loam, 10 percent olive brown (2.5Y 4/4) angular soil fragments; gray (10YR 5/1) dry; massive, compacted; firm; few very fine roots flattened along vertical faces of angular blocks; slightly effervescent in soil fragments; neutral; abrupt smooth boundary.

C3—26 to 50 inches; silty clay loam, 80 percent olive brown (2.5Y 4/4), 15 percent light olive brown (2.5Y 5/6), and 5 percent gray (N 5/0); massive; firm; few isolated peds of relict genetic horizons with few fine distinct dark yellowish brown (10YR 4/6) and yellowish brown (10YR 5/8) masses of iron accumulation and few fine masses of manganese accumulation with diffuse boundaries; about 3 percent fine and 1 percent medium gravel; strongly effervescent; slightly alkaline; clear smooth boundary.

C4—50 to 80 inches; clay loam, 85 percent olive brown (2.5Y 4/4), 10 percent light olive brown (2.5Y 5/6), and 5 percent gray (N 5/0); massive; firm; common isolated peds of relict genetic horizons with few fine distinct dark yellowish brown (10YR 4/6) and yellowish brown (10YR 5/8) masses of iron accumulation and few fine distinct masses of manganese accumulation with diffuse boundaries; about 5 percent fine and 1 percent medium gravel and a few fragments of clay shale; strongly effervescent; slightly alkaline.

Range in Characteristics

Thickness of replaced topsoil and BC mix: 48 to more than 60 inches

Ap and C1 horizons:
Hue—10YR or 2.5Y
Value—2 to 4
Chroma—1 or 2
Texture—silty clay loam

C2, C3, and C4 horizons:
Hue—10YR, 2.5Y, or N
Value—2 to 6
Chroma—0 to 6
Texture—silty clay loam or clay loam

872B—Rapatee silty clay loam, 2 to 5 percent slopes

Setting

Landform: Reconstructed upland ridges
Position on the landform: Broad summits

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Reclaimed fine-earth material (with a surface layer of pre-mined soil) overlying cast overburden from surface mining

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Rapatee and similar soils: 85 percent
Dissimilar components: 15 percent

Similar soils:
- Areas of spoil material at the surface
- Soils that have more than 10 percent rock fragments throughout

Dissimilar components:
- The well drained Osco and somewhat poorly drained Ipava soils in undisturbed areas along the borders of the map unit

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Rozetta Series

Taxonomic classification: Fine-silty, mixed, superactive, mesic Typic Hapludalfs
Taxadjunct features: The Rozetta soil in map unit 279C3 has redoximorphic features higher in the profile than is defined as the range for the series. This soil is classified as a fine-silty, mixed, superactive, mesic Aquic Hapludalf.

Typical Pedon

Rozetta silt loam, 2 to 5 percent slopes, 2,574 feet west and 429 feet north of the southeast corner of sec. 15, T. 4 N., R. 2 E.

Ap—0 to 7 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak very fine granular structure; friable; common very fine and few fine roots; neutral; clear smooth boundary.

E—7 to 11 inches; brown (10YR 4/3) silt loam; weak medium platy structure parting to weak very fine subangular blocky; friable; common very fine roots; few distinct light gray (10YR 7/2 dry) silt coatings on faces of peds; neutral; clear smooth boundary.

Bt1—11 to 19 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine subangular blocky structure; friable; common very fine roots; common distinct dark yellowish brown (10YR 4/4) clay films and few distinct light gray (10YR 7/2 dry) silt coatings on faces of peds; few fine black (10YR 2/1) manganese concretions with sharp boundaries in ped interiors; moderately acid; clear smooth boundary.

Bt2—19 to 29 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; common very fine roots; few distinct dark yellowish brown (10YR 4/4) clay films and few distinct light gray (10YR 7/2 dry) silt coatings on faces of peds; few fine distinct dark yellowish brown (10YR 4/6) masses of iron accumulation with diffuse boundaries and few fine black (10YR 2/1) manganese concretions with sharp boundaries in ped interiors; moderately acid; gradual smooth boundary.

Bt3—29 to 39 inches; silty clay loam, 80 percent yellowish brown (10YR 5/4), 15 percent yellowish brown (10YR 5/6), and 5 percent pale brown (10YR 6/3); weak medium prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots; common distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; few fine distinct dark yellowish brown (10YR 4/6) masses of iron accumulation with diffuse boundaries and common fine black (10YR 2/1) manganese concretions with sharp boundaries in ped interiors; strongly acid; gradual smooth boundary.

Bt4—39 to 45 inches; silty clay loam, 60 percent yellowish brown (10YR 5/4), 20 percent yellowish brown (10YR 5/6), and 20 percent pale brown (10YR 6/3); weak coarse prismatic structure parting to moderate coarse subangular blocky; friable; few very fine roots; few distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; few fine distinct dark yellowish brown (10YR 4/6) masses of iron accumulation with diffuse boundaries and few fine black (10YR 2/1) manganese concretions with sharp boundaries in ped interiors; moderately acid; gradual smooth boundary.

BC—45 to 55 inches; silty clay loam, 70 percent yellowish brown (10YR 5/4) and 30 percent yellowish brown (10YR 5/6); weak coarse prismatic structure; friable; few very fine roots; few distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; common fine distinct dark yellowish brown (10YR 4/6) masses of iron accumulation with diffuse boundaries and few fine black (10YR 2/1) manganese concretions with sharp boundaries in ped interiors; common fine distinct light brownish gray (10YR 6/2) iron depletions along root channels and pores; moderately acid; gradual smooth boundary.

C—55 to 60 inches; yellowish brown (10YR 5/6) silt loam; massive; friable; few very fine roots; common fine distinct dark yellowish brown (10YR 4/6) masses of iron accumulation with diffuse boundaries and few fine black (10YR 2/1) manganese concretions with sharp boundaries throughout; common fine distinct light brownish gray (10YR 6/2) iron depletions along pores; moderately acid.

Range in Characteristics

Content of clay in the control section: 27 to 35 percent

Ap horizon:
Chroma—2 or 3
Texture—silt loam or silty clay loam

Bt horizon:
Value—5 or 6
Chroma—3 to 6

C horizon:
Value—5 or 6
Chroma—4 to 6
Texture—silt loam or silty clay loam

279B—Rozetta silt loam, 2 to 5 percent slopes

Setting

Landform: Interfluves
Position on the landform: Summits

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Loess

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Rozetta and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
- Soils that have a darker and thicker surface layer
- Soils that have gray colors at a depth of less than 48 inches

Dissimilar components:
- The somewhat poorly drained Keomah soils in the less sloping positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

279C2—Rozetta silt loam, 5 to 10 percent slopes, eroded

Setting

Landform: Head slopes and side slopes along upland drainageways
Position on the landform: Shoulders

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Loess
Other properties: This soil has a thinner surface layer than the Rozetta soil in map unit 279B.

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Rozetta and similar soils: 90 percent
Dissimilar components: 10 percent

Similar soils:
- Soils that have a surface layer of silty clay loam
- Soils that have calcareous silt loam at a depth of less than 40 inches

Dissimilar components:
- The somewhat poorly drained Atlas soils in positions on the landform downslope from those of the Rozetta soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

279C3—Rozetta silty clay loam, 5 to 10 percent slopes, severely eroded

Setting

Landform: Head slopes and side slopes along upland drainageways
Position on the landform: Shoulders

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Loess
Other properties: This soil has a thinner surface layer and contains more clay than the Rozetta soil in map unit 279B.

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Rozetta and similar soils: 90 percent
Dissimilar components: 10 percent

Similar soils:
- Soils that have a surface layer of silt loam
- Soils that have calcareous silt loam at a depth of less than 40 inches

Dissimilar components:
- The somewhat poorly drained Atlas soils in positions on the landform downslope from those of the Rozetta soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

9279B—Rozetta silt loam, terrace, 2 to 5 percent slopes

Setting

Landform: Interfluves on stream terraces
Position on the landform: Summits

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Loess or other silty material

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Rozetta and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
- Soils that have gray colors at a depth of less than 40 inches
- Soils that have more sand in the lower part of the subsoil

Dissimilar components:
- The somewhat poorly drained Keomah soils in the less sloping positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

9279C—Rozetta silt loam, terrace, 5 to 10 percent slopes, eroded

Setting

Landform: Head slopes and side slopes along drainageways on stream terraces
Position on the landform: Shoulders

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Loess or other silty material
Other properties: This soil has a thinner surface layer than the Rozetta soil in map unit 279B.

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Rozetta and similar soils: 90 percent
Dissimilar components: 10 percent

Similar soils:
- Soils that have a surface layer of silty clay loam
- Soils that have more sand in the lower part of the subsoil

Dissimilar components:
- The well drained Camden and excessively drained Chelsea soils in the more sloping positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Rushville Series

Taxonomic classification: Fine, smectitic, mesic Typic Albaqualfs

Typical Pedon

Rushville silt loam, 0 to 2 percent slopes, 480 feet south and 160 feet east of the northwest corner of sec. 6, T. 7 N., R. 5 E.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine granular structure; few very fine roots; slightly acid; clear smooth boundary.

Eg—7 to 14 inches; grayish brown (10YR 5/2) silt loam; weak medium platy structure parting to weak very fine subangular blocky; friable; few very fine roots; common distinct light gray (10YR 7/1 dry) silt coatings on faces of peds; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation and few fine black (10YR 2/1) manganese concretions with diffuse boundaries along root channels and pores; moderately acid; clear smooth boundary.

Btg1—14 to 19 inches; light brownish gray (2.5Y 6/2) silty clay loam; weak fine subangular blocky structure; firm; few very fine roots; common distinct grayish brown (2.5Y 5/2) clay films and common distinct light gray (10YR 7/1 dry) silt coatings on faces of peds; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation and few fine black (10YR 2/1) manganese concretions with diffuse boundaries along root channels and pores; slightly acid; clear smooth boundary.

Btg2—19 to 31 inches; light brownish gray (2.5Y 6/2) silty clay; weak medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; common distinct grayish brown (2.5Y 5/2) clay films on faces of peds; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation and few fine black (10YR 2/1) manganese concretions with diffuse boundaries along root channels and pores; slightly acid; gradual smooth boundary.

Btg3—31 to 43 inches; light brownish gray (2.5Y 6/2) silty clay loam; weak medium prismatic structure; firm; few very fine roots; few distinct grayish brown (2.5Y 5/2) clay films on faces of peds; many fine prominent yellowish brown (10YR 5/6) masses of iron accumulation and common fine black (10YR 2/1) manganese concretions with diffuse boundaries along root channels and pores; neutral; gradual smooth boundary.

Cg—43 to 60 inches; light brownish gray (2.5Y 6/2) silt loam; massive; friable; many medium prominent yellowish brown (10YR 5/6) masses of iron accumulation with diffuse boundaries and common fine black (10YR 2/1) manganese concretions with diffuse boundaries along pores; neutral.

Range in Characteristics

Content of clay in the control section: 35 to 45 percent

Btg horizon:
Texture—silty clay loam or silty clay

16A—Rushville silt loam, 0 to 2 percent slopes

Setting

Landform: Interfluves
Position on the landform: Closed depressions on broad summits

Soil Properties and Qualities

Drainage class: Poorly drained
Parent material: Loess

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Rushville and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
- Soils that have a darker and thicker surface layer

Dissimilar components:
- The well drained Rozetta soils in the more sloping positions on the landform
- The somewhat poorly drained Keomah soils in the slightly higher positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Sable Series

Taxonomic classification: Fine-silty, mixed, superactive, mesic Typic Endoaquolls

Typical Pedon

Sable silty clay loam, 0 to 2 percent slopes, 2,520 feet south and 2,400 feet east of the northwest corner of sec. 9, T. 7 N., R. 1 E.

Ap—0 to 8 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate very fine subangular blocky structure; friable; few very fine roots; neutral; clear smooth boundary.

A—8 to 17 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; moderate fine subangular blocky structure; friable; few very fine and fine roots; neutral; clear smooth boundary.

AB—17 to 23 inches; silty clay loam, 75 percent very dark gray (10YR 3/1), 20 percent dark grayish brown (10YR 4/2), and 5 percent brown (10YR 4/3); gray (10YR 5/1) dry; moderate fine subangular blocky structure; friable; few very fine and fine roots; neutral; clear smooth boundary.

Btg1—23 to 31 inches; dark grayish brown (2.5Y 4/2) silty clay loam; weak fine prismatic structure parting to moderate fine subangular blocky; firm; few very fine and fine roots; many distinct dark gray (10YR 4/1) clay films on faces of peds and few distinct very dark gray (10YR 3/1) organic coatings lining root channels and pores; few fine distinct yellowish brown (10YR 5/8) masses of iron accumulation and few fine black (10YR 2/1) masses of manganese accumulation with diffuse boundaries along pores; neutral; clear smooth boundary.

Btg2—31 to 40 inches; dark grayish brown (2.5Y 4/2) silty clay loam; moderate fine prismatic structure parting to moderate fine subangular blocky; firm; few very fine and fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; many fine distinct yellowish brown (10YR 5/6 and 5/8) masses of iron accumulation and common fine black (10YR 2/1) masses of manganese accumulation with diffuse boundaries along ped surfaces and pores; neutral; clear smooth boundary.

Btg3—40 to 51 inches; light olive gray (5Y 6/2) silty clay loam; moderate fine prismatic structure; firm; few very fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; many medium distinct yellowish brown (10YR 5/6) and few fine distinct yellowish brown (10YR 5/4) masses of iron accumulation and few fine black (10YR 2/1) masses of manganese accumulation with diffuse boundaries along pores; slightly alkaline; clear smooth boundary.

BCg—51 to 60 inches; light olive gray (5Y 6/2) silt loam; weak coarse subangular blocky structure; friable; very few distinct grayish brown (10YR 5/2) clay films lining pores; many medium distinct yellowish brown (10YR 5/8) masses of iron accumulation and few fine black (10YR 2/1) masses of manganese accumulation with diffuse boundaries along pores; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 12 to 24 inches
Content of clay in the control section: 27 to 35 percent

Ap horizon:
Value—2 or 3

B horizon:
Hue—2.5Y or 5Y
Value—4 to 6
Texture—silty clay loam

68A—Sable silty clay loam, 0 to 2 percent slopes

Setting

Landform: Upland drainage divides
Position on the landform: Low-lying areas

Soil Properties and Qualities

Drainage class: Poorly drained

Parent material: Loess

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Sable and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
- Soils that have more clay in the subsoil

Dissimilar components:
- The well drained Osco soils in the higher positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

9068A—Sable silty clay loam, terrace, 0 to 2 percent slopes

Setting

Landform: Treads of stream terraces
Position on the landform: Low-lying areas

Soil Properties and Qualities

Drainage class: Poorly drained
Parent material: Loess or other silty material

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Sable and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
- Soils that have more clay in the subsoil
- Soils that have more sand in the lower part of the subsoil

Dissimilar components:
- The somewhat poorly drained Clarksdale soils in the slightly higher positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Sarpy Series

Taxonomic classification: Mixed, mesic Typic Udipsamments

Typical Pedon

Sarpy sand, 1 to 7 percent slopes, occasionally flooded, 1,831 feet east and 2,164 feet south of the northwest corner of sec. 25, T. 6 N., R. 5 E.

A1—0 to 2 inches; 75 percent very dark gray (10YR 3/1) sand and 25 percent white (10YR 8/1) uncoated sand grains; gray (10YR 5/1) dry; weak fine granular structure; very friable; few very fine roots; about 15 percent shell fragments; strongly effervescent; neutral; clear smooth boundary.

A2—2 to 6 inches; 50 percent very dark grayish brown (10YR 3/2) sand and 50 percent uncoated sand grains; grayish brown (10YR 5/2) dry; very weak fine granular structure; very friable; few very fine roots; about 15 percent shell fragments; strongly effervescent; neutral; gradual smooth boundary.

C—6 to 80 inches; brown (10YR 5/3) sand; single grain; loose; few very fine roots in the upper 6 inches; about 15 percent shell fragments; violently effervescent; slightly alkaline.

Range in Characteristics

Ap or A horizon:
Value—3 to 5
Chroma—1 or 2

8092B—Sarpy sand, 1 to 7 percent slopes, occasionally flooded

Setting

Landform: Alluvial ridges on flood plains
Position on the landform: Summits

Soil Properties and Qualities

Drainage class: Excessively drained
Parent material: Stream alluvium

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Sarpy and similar soils: 90 percent
Dissimilar components: 10 percent

Similar soils:
- Soils that have less sand and more silt throughout

Dissimilar components:
- The poorly drained Beaucoup and somewhat poorly drained Wakeland soils in low-lying areas

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Sawmill Series

Taxonomic classification: Fine-silty, mixed, superactive, mesic Cumulic Endoaquolls

Typical Pedon

Sawmill silty clay loam, 0 to 2 percent slopes, frequently flooded, 2,250 feet north and 705 feet east of the southwest corner of sec. 31, T. 7 N., R. 2 E.

Ap—0 to 7 inches; very dark gray (10YR 3/1) silty clay loam, dark grayish brown (10YR 4/2) dry; weak fine granular structure; friable; few very fine roots; slightly acid; clear smooth boundary.

A1—7 to 17 inches; very dark gray (10YR 3/1) silty clay loam, dark grayish brown (10YR 4/2) dry; moderate medium subangular blocky structure; friable; few very fine roots; few fine distinct dark yellowish brown (10YR 4/6) masses of iron accumulation and few fine black (10YR 2/1) manganese concretions with diffuse boundaries along root channels and pores; slightly acid; gradual smooth boundary.

A2—17 to 26 inches; very dark grayish brown (10YR 3/2) silty clay loam, grayish brown (10YR 5/2) dry; moderate fine and medium subangular blocky structure; friable; few very fine roots; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few fine distinct dark yellowish brown (10YR 4/6) masses of iron accumulation and few fine black (10YR 2/1) manganese concretions with diffuse boundaries along root channels and pores; common fine distinct dark grayish brown (10YR 4/2) iron depletions in ped interiors; slightly acid; gradual smooth boundary.

Btg1—26 to 34 inches; dark grayish brown (2.5Y 4/2) silty clay loam; moderate medium subangular blocky structure; friable; few very fine roots; common distinct dark gray (10YR 4/1) clay films on faces of peds; many fine prominent dark yellowish brown (10YR 4/6) masses of iron accumulation and few fine black (10YR 2/1) manganese concretions with diffuse boundaries along root channels and pores; neutral; gradual smooth boundary.

Btg2—34 to 46 inches; grayish brown (2.5Y 5/2) silty clay loam; moderate medium and coarse subangular blocky structure; friable; few very fine roots; common distinct dark gray (10YR 4/1) clay films on faces of peds; many medium prominent dark yellowish brown (10YR 4/6) masses of iron accumulation and few fine medium black (10YR 2/1) manganese concretions with diffuse boundaries along root channels and pores; neutral; clear smooth boundary.

BCg—46 to 54 inches; grayish brown (2.5Y 5/2) and light brownish gray (2.5Y 6/2) silty clay loam; weak medium and coarse subangular blocky structure; friable; few very fine roots; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation and few medium black (10YR 2/1) manganese concretions with diffuse boundaries along root channels and pores; neutral; clear smooth boundary.

Cg—54 to 60 inches; light brownish gray (2.5Y 6/2) clay loam; massive; friable; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation and few medium black (10YR 2/1) manganese concretions with diffuse boundaries along pores; neutral.

Range in Characteristics

Thickness of the mollic epipedon: 24 to 36 inches
Content of clay in the control section: 27 to 35 percent

Ap and A horizons:
Chroma—1 or 2

Btg horizon:
Value—4 or 5

Cg horizon:
Hue—10YR, 2.5Y, or N
Value—5 or 6
Chroma—0 to 2

3107A—Sawmill silty clay loam, 0 to 2 percent slopes, frequently flooded

Setting

Landform: Flood plains
Position on the landform: Low-lying areas

Soil Properties and Qualities

Drainage class: Poorly drained
Parent material: Stream alluvium

Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Sawmill and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
• Soils that have a dark surface layer less than 24 inches thick
• Soils that have more clay in the subsoil

Dissimilar components:
• Titus soils, which have more clay in the subsoil than the Sawmill soil; in the slightly lower positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

• "Agronomy" section
• "Forestland" section
• "Wildlife Habitat" section
• "Engineering" section
• "Soil Properties" section

Schuline Series

Taxonomic classification: Fine-loamy, mixed, superactive, calcareous, mesic Typic Udorthents

Typical Pedon

Schuline silty clay loam, 7 to 20 percent slopes, 2,409 feet north and 858 feet east of the southwest corner of sec. 15, T. 4 N., R. 1 E.

Ap—0 to 5 inches; silty clay loam, 60 percent gray (10YR 5/1), 20 percent yellowish brown (10YR 5/6), and 20 percent brown (10YR 5/3); weak fine and medium granular structure; friable; many very fine and common fine roots; about 5 percent rock fragments (till pebbles and coal); slightly alkaline; clear smooth boundary.

C1—5 to 11 inches; silty clay loam, 70 percent gray (10YR 5/1), 20 percent dark grayish brown (10YR 4/2), and 10 percent dark yellowish brown (10YR 4/6); few pockets of brown (10YR 5/3) silt loam; massive; firm; common very fine and fine roots, flattened, along vertical fractures and horizontal compacted layers; about 5 percent rock fragments (till pebbles and shale); slightly effervescent; slightly alkaline; gradual smooth boundary.

C2—11 to 24 inches; silty clay loam, 70 percent grayish brown (10YR 5/2) and 30 percent dark yellowish brown (10YR 4/6); layer of gray (10YR 5/1) shale at a depth of 15 to 16 inches; massive; firm; few very fine and fine roots, flattened, along vertical fractures and horizontal compacted layers; about 10 percent rock fragments (till pebbles, coal, and channers of shale); slightly effervescent; neutral; gradual smooth boundary.

C3—24 to 40 inches; silty clay loam, 40 percent yellowish brown (10YR 5/6), 40 percent dark yellowish brown (10YR 4/6), and 20 percent gray (10YR 5/1) and light gray (10YR 6/1); massive; firm; few very fine roots, flattened, along vertical fractures and horizontal compacted layers; about 10 percent rock fragments (till pebbles and channers of shale); slightly effervescent; neutral; gradual smooth boundary.

C4—40 to 60 inches; silty clay loam, 30 percent yellowish brown (10YR 5/6), 30 percent dark yellowish brown (10YR 4/6), and 40 percent gray (10YR 5/1) and light gray (10YR 6/1); massive; firm; about 15 percent rock fragments (till pebbles and channers of shale and sandstone); slightly effervescent; neutral.

Range in Characteristics

Ap horizon:
Value—4 or 5
Chroma—1 to 6
Texture—silty clay loam, clay loam, or silt loam

C horizon:
Value—4 to 7
Chroma—1 to 6
Texture—silty clay loam, clay loam, or silt loam

823B—Schuline silty clay loam, 1 to 7 percent slopes

Setting

Landform: Reconstructed upland ridges
Position on the landform: Summits and shoulders

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Reclaimed fine-earth material overlying cast overburden from surface mining

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Schuline and similar soils: 90 percent
Dissimilar components: 10 percent

Similar soils:
- Soils that have an average of more than 15 percent rock fragments in the surface layer

Dissimilar components:
- Soils in depressional areas that are frequently ponded

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

823D—Schuline silty clay loam, 7 to 20 percent slopes

Setting

Landform: Reconstructed upland ridges
Position on the landform: Shoulders and backslopes

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Reclaimed fine-earth material overlying cast overburden from surface mining

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Schuline and similar soils: 90 percent
Dissimilar components: 10 percent

Similar soils:
- Soils that have slopes of more than 10 percent
- Soils that have an average of more than 15 percent rock fragments in the surface layer

Dissimilar components:
- Soils in depressional areas that are frequently ponded

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Seaton Series

Taxonomic classification: Fine-silty, mixed, superactive, mesic Typic Hapludalfs

Typical Pedon

Seaton silt loam, 18 to 35 percent slopes, 2,000 feet north and 2,040 feet east of the southwest corner of sec. 36, T. 3 N., R. 2 E.

A—0 to 5 inches; very dark grayish brown (10YR 3/2) silt loam, dark grayish brown (10YR 4/2) dry; weak fine granular structure; very friable; common very fine and fine roots; neutral; clear smooth boundary.

E—5 to 9 inches; dark grayish brown (10YR 4/2) silt loam; weak thin platy structure; very friable; common very fine and fine roots; common distinct dark brown (10YR 3/3) organic coatings lining root channels and pores; neutral; clear smooth boundary.

Bt1—9 to 15 inches; dark yellowish brown (10YR 4/4) silt loam; moderate fine subangular blocky structure; friable; common very fine and fine roots; few distinct light gray (10YR 7/2 dry) silt coatings and common distinct brown (10YR 4/3) clay films on faces of peds; neutral; clear smooth boundary.

Bt2—15 to 26 inches; dark yellowish brown (10YR 4/6) silt loam; moderate fine subangular blocky structure; friable; few very fine and fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; slightly acid; clear smooth boundary.

Bt3—26 to 36 inches; yellowish brown (10YR 5/4) silt loam; weak medium subangular blocky structure; friable; few very fine and fine roots; few distinct brown (10YR 4/3) clay films on faces of peds; slightly acid; clear smooth boundary.

BC—36 to 58 inches; yellowish brown (10YR 5/4) silt loam; weak medium subangular blocky structure;

very friable; few distinct brown (10YR 4/3) clay films and few distinct light gray (10YR 7/2 dry) silt coatings on faces of peds; neutral; clear smooth boundary.

C—58 to 80 inches; light yellowish brown (10YR 6/4) silt; massive; very friable; slightly effervescent; moderately alkaline.

Range in Characteristics

Content of clay in the control section: 18 to 27 percent

Ap or A horizon:
Value—3 or 4

E horizon:
Value—4 or 5
Chroma—2 to 4

Bt horizon:
Value—4 or 5
Chroma—3 to 6

C horizon:
Value—5 or 6
Chroma—2 to 6

274E2—Seaton silt loam, 18 to 25 percent slopes, eroded

Setting

Landform: Side slopes along upland drainageways
Position on the landform: Backslopes

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Loess

Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Seaton and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
- Soils that have more clay or more clay and sand in the subsoil
- Soils that have calcareous silt loam at a depth of less than 40 inches

Dissimilar components:
- The moderately well drained Blyton soils on narrow flood plains

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

274F—Seaton silt loam, 18 to 35 percent slopes

Setting

Landform: Side slopes along upland drainageways
Position on the landform: Backslopes

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Loess

Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Seaton and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
- Soils that have calcareous silt loam at a depth of less than 40 inches
- Soils that have more clay or more clay and sand in the subsoil

Dissimilar components:
- Bedrock outcroppings

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

274G—Seaton silt loam, 35 to 60 percent slopes

Setting

Landform: Side slopes along upland drainageways
Position on the landform: Backslopes

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Loess

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Seaton and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
- Soils that have calcareous silt loam at a depth of less than 40 inches
- Soils that have more clay and sand in the subsoil

Dissimilar components:
- Bedrock outcroppings

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Sepo Series

Taxonomic classification: Fine-silty, mixed, superactive, mesic Fluvaquentic Endoaquolls

Typical Pedon

Sepo silty clay loam, 0 to 2 percent slopes, occasionally flooded, 1,465 feet east and 333 feet south of the northwest corner of sec. 17, T. 4 N., R. 4 E.

Ap—0 to 8 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; weak fine subangular blocky structure; firm; many very fine roots; about 1 percent shell fragments; slightly effervescent; neutral; abrupt smooth boundary.

A1—8 to 12 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine and medium subangular blocky structure; firm; common very fine roots; about 1 percent shell fragments; strongly effervescent; slightly alkaline; abrupt smooth boundary.

A2—12 to 19 inches; very dark gray (N 3/0) silty clay loam, gray (N 5/0) dry; moderate fine angular blocky structure; firm; common very fine roots; about 1 percent shell fragments; few fine prominent strong brown (7.5YR 4/6) masses of iron accumulation with diffuse boundaries lining pores; strongly effervescent; slightly alkaline; abrupt smooth boundary.

Bg1—19 to 28 inches; dark gray (N 4/0) silty clay loam; moderate fine prismatic structure parting to moderate fine angular blocky; firm; few very fine roots; common distinct dark gray (10YR 4/1) pressure faces; about 1 percent shell fragments; few fine prominent strong brown (7.5YR 4/6) masses of iron accumulation with diffuse boundaries lining pores; strongly effervescent; slightly alkaline; abrupt smooth boundary.

Bg2—28 to 32 inches; dark gray (N 4/0) silty clay loam; moderate fine subangular blocky structure; firm; about 4 percent shell fragments; common fine prominent strong brown (7.5YR 4/6) masses of iron accumulation with diffuse boundaries lining pores; strongly effervescent; moderately alkaline; abrupt smooth boundary.

BCg—32 to 42 inches; dark gray (N 4/0) silty clay loam with strata of loam; weak coarse subangular blocky structure; firm; about 1 percent shell fragments; common fine prominent strong brown (7.5YR 4/6) masses of iron accumulation with diffuse boundaries lining pores; violently effervescent; moderately alkaline; abrupt smooth boundary.

Cg—42 to 70 inches; grayish brown (10YR 5/2) silty clay loam with strata of silt loam; massive; firm; many fine distinct yellowish brown (10YR 5/6) masses of iron accumulation with diffuse boundaries lining pores; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches
Content of clay in the control section: 27 to 35 percent

Ap and A horizons:
Hue—10YR, 2.5Y, or N
Value—2 or 3
Chroma—0 or 1

8611A—Sepo silty clay loam, 0 to 2 percent slopes, occasionally flooded

Setting

Landform: Flood plains
Position on the landform: Low-lying areas

Soil Properties and Qualities

Drainage class: Poorly drained
Parent material: Stream alluvium

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Sepo and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
- Soils that have carbonates below a depth of 40 inches
- Soils that have more sand in the subsoil
- Soils that have more clay in the subsoil

Dissimilar components:
- The somewhat poorly drained Tice soils in the higher positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Shaffton Series

Taxonomic classification: Fine-loamy, mixed, superactive, mesic Fluvaquentic Hapludolls

Typical Pedon

Shaffton clay loam, 0 to 2 percent slopes, occasionally flooded, 2,164 feet west and 2,097 feet north of the southeast corner of sec. 36, T. 4 N., R. 3 E.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) clay loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; few very fine roots; strongly acid; clear smooth boundary.

A—9 to 12 inches; very dark grayish brown (10YR 3/2) clay loam, grayish brown (10YR 5/2) dry; weak very fine subangular blocky structure; friable; few very fine roots; few fine distinct dark yellowish brown (10YR 3/4) masses of iron accumulation with diffuse boundaries throughout; strongly acid; clear smooth boundary.

Bw1—12 to 17 inches; dark grayish brown (10YR 4/2) clay loam; moderate fine subangular blocky structure; friable; few very fine roots; many distinct very dark grayish brown (10YR 3/2) organic coatings lining root channels and pores; common fine distinct dark yellowish brown (10YR 4/4) and few fine distinct dark brown (7.5YR 3/4) masses of iron accumulation and few fine black (10YR 2/1) masses of manganese accumulation with diffuse boundaries along root channels and pores; strongly acid; clear smooth boundary.

Bw2—17 to 27 inches; dark grayish brown (10YR 4/2) clay loam; moderate fine and medium subangular blocky structure; friable; few very fine roots; common distinct very dark grayish brown (10YR 3/2) organic coatings lining root channels and pores; common fine distinct dark yellowish brown (10YR 4/4) and few fine distinct dark brown (7.5YR 3/4) masses of iron accumulation and few fine black (10YR 2/1) masses of manganese accumulation with diffuse boundaries along root channels and pores; strongly acid; clear smooth boundary.

Bw3—27 to 32 inches; grayish brown (10YR 5/2) clay loam; moderate medium subangular blocky structure; friable; common fine distinct dark yellowish brown (10YR 4/4) and few fine distinct dark brown (7.5YR 3/4) masses of iron accumulation and few fine black (10YR 2/1) masses of manganese accumulation with diffuse boundaries along pores; strongly acid; clear smooth boundary.

Bw4—32 to 36 inches; grayish brown (10YR 5/2) sandy clay loam; weak coarse subangular blocky structure; friable; common fine distinct dark yellowish brown (10YR 4/4) and common fine distinct dark brown (7.5YR 3/4) masses of iron accumulation and few fine black (10YR 2/1) masses of manganese accumulation with diffuse boundaries along pores; strongly acid; clear smooth boundary.

2C1—36 to 51 inches; coarse sandy loam, 60 percent brown (10YR 4/3) and 40 percent grayish brown (10YR 5/2); massive; very friable; common medium distinct dark yellowish brown (10YR 4/4) masses of iron accumulation with diffuse boundaries along pores; strongly acid; clear smooth boundary.

2C2—51 to 60 inches; brown (10YR 4/3) loamy coarse sand; single grain; loose; few medium distinct dark yellowish brown (10YR 4/4) masses of iron accumulation with diffuse boundaries along pores; moderately acid.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches
Content of clay in the control section: 27 to 35 percent

Bw horizon:
Value—4 or 5
Texture—clay loam or sandy clay loam

C horizon:
Value—4 or 5
Chroma—2 to 4
Texture—coarse sandy loam or loamy coarse sand

8183A—Shaffton clay loam, 0 to 2 percent slopes, occasionally flooded

Setting

Landform: Rises on flood plains
Position on the landform: Summits

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Parent material: Stream alluvium

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Shaffton and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
- Soils that have less sand in the subsoil

Dissimilar components:
- The poorly drained Beaucoup and Titus soils in the lower positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Sparta Series

Taxonomic classification: Sandy, mixed, mesic Entic Hapludolls

Typical Pedon

Sparta loamy fine sand, 1 to 7 percent slopes, 410 feet west and 2,320 feet south of the northeast corner of sec. 16, T. 3 N., R. 3 E.

Ap—0 to 6 inches; very dark grayish brown (10YR 3/2) loamy fine sand, grayish brown (10YR 5/2) dry; weak very fine subangular blocky structure; very friable; few very fine roots; neutral; abrupt smooth boundary.
A—6 to 11 inches; very dark grayish brown (10YR 3/2) loamy fine sand, dark grayish brown (10YR 4/2) dry; weak fine subangular blocky structure; very friable; neutral; clear smooth boundary.
Bw1—11 to 22 inches; dark yellowish brown (10YR 4/6) loamy fine sand; weak fine subangular blocky structure; very friable; neutral; clear smooth boundary.
Bw2—22 to 27 inches; yellowish brown (10YR 5/6) loamy fine sand; weak medium subangular blocky structure; very friable; neutral; clear smooth boundary.
C—27 to 80 inches; fine sand, 70 percent light yellowish brown (10YR 6/4) and 30 percent yellowish brown (10YR 5/6); single grain; loose; neutral.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 15 inches

Bw horizon:
Value—4 or 5

C horizon:
Value—5 or 6
Chroma—3 to 6
Texture—sand or fine sand

88B—Sparta loamy fine sand, 1 to 7 percent slopes

Setting

Landform: Ridges on stream terraces
Position on the landform: Summits and shoulders

Soil Properties and Qualities

Drainage class: Excessively drained
Parent material: Outwash

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Sparta and similar soils: 90 percent
Dissimilar components: 10 percent

Similar soils:
- Soils that have a thinner and lighter colored surface layer

Dissimilar components:
- The well drained Dakota soils, which have more coarse sand and gravel in the lower part of the subsoil

than the Sparta soil; in positions on the landform similar to those of the Sparta soil
- The well drained Onarga soils in the less sloping positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

St. Charles Series

Taxonomic classification: Fine-silty, mixed, superactive, mesic Typic Hapludalfs

Typical Pedon

St. Charles silt loam, 2 to 5 percent slopes, 2,331 feet west and 330 feet north of the southeast corner of sec. 12, T. 5 N., R. 1 E.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine granular structure; friable; few very fine roots; slightly acid; abrupt smooth boundary.

Bt1—8 to 11 inches; brown (10YR 4/3) silty clay loam; moderate fine subangular blocky structure; friable; few very fine roots; many distinct dark brown (7.5YR 3/4) clay films on faces of peds; moderately acid; clear smooth boundary.

Bt2—11 to 20 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine and medium subangular blocky structure; firm; few very fine roots; many distinct dark brown (7.5YR 3/4) and brown (10YR 4/3) clay films on faces of peds; moderately acid; clear smooth boundary.

Bt3—20 to 28 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium subangular blocky structure; firm; few very fine roots; common distinct brown (10YR 4/3) clay films on faces of peds and common distinct dark brown (7.5YR 3/4) clay films lining root channels and pores; moderately acid; clear smooth boundary.

Bt4—28 to 40 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium subangular blocky structure; firm; few very fine roots; common distinct brown (10YR 4/3) clay films on faces of peds and few distinct dark brown (7.5YR 3/4) clay films lining root channels and pores; strongly acid; clear smooth boundary.

Bt5—40 to 52 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium subangular blocky structure; firm; common distinct dark brown (7.5YR 3/4) clay films on faces of peds; strongly acid; clear smooth boundary.

Bt6—52 to 70 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak medium subangular blocky structure; firm; common distinct dark brown (7.5YR 3/4) clay films on faces of peds; very strongly acid; clear smooth boundary.

2BC—70 to 80 inches; dark yellowish brown (10YR 4/4) clay loam; moderate medium and coarse subangular blocky structure; firm; strongly acid.

Range in Characteristics

Thickness of the loess: 40 to 80 inches
Content of clay in the control section: 27 to 35 percent

243B—St. Charles silt loam, 2 to 5 percent slopes

Setting

Landform: Ridges on stream terraces
Position on the landform: Summits (fig. 14)

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Loess or other silty material and the underlying outwash

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

St. Charles and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
- Soils that have more sand in the upper part of the subsoil

Dissimilar components:
- The somewhat poorly drained Kendall soils in the less sloping positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section

Figure 14.—An area of St. Charles silt loam, 2 to 5 percent slopes, on a stream terrace.

- “Soil Properties” section

Sylvan Series

Taxonomic classification: Fine-silty, mixed, superactive, mesic Typic Hapludalfs

Typical Pedon

Sylvan silty clay loam, 10 to 18 percent slopes, severely eroded, 5,100 feet south and 1,400 feet west of the northeast corner of sec. 14, T. 6 N., R. 2 E.

Ap—0 to 9 inches; brown (10YR 4/3), dark yellowish brown (10YR 4/4), and light brownish gray (10YR 6/2) silty clay loam, pale brown (10YR 6/3) dry; weak fine granular structure; friable; few very fine roots; neutral; clear smooth boundary.

Bt1—9 to 15 inches; light brownish gray (10YR 6/2) silty clay loam; moderate medium subangular blocky structure; friable; few very fine roots; common distinct brown (10YR 5/3) clay films on faces of peds and brown (10YR 4/3) clay films lining root channels and pores; common medium prominent strong brown (7.5YR 5/6) masses of iron accumulation with sharp boundaries in ped interiors; moderately acid; clear smooth boundary.

Bt2—15 to 22 inches; light brownish gray (10YR 6/2) silty clay loam; weak coarse subangular blocky structure; friable; few very fine roots; common distinct brown (10YR 5/3) clay films on faces of peds and brown (10YR 4/3) clay films lining root channels and pores; many coarse prominent strong brown (7.5YR 5/6) masses of iron accumulation with diffuse boundaries in ped interiors; slightly acid; clear smooth boundary.

Bt3—22 to 28 inches; light brownish gray (10YR 6/2) silt loam; weak coarse subangular blocky structure; friable; few very fine roots; very few distinct brown (10YR 5/3) clay films on faces of peds and common distinct brown (10YR 4/3) clay films lining root channels and pores; common coarse prominent yellowish brown (10YR 5/6) and strong brown (7.5YR 5/6) masses of iron accumulation with diffuse boundaries in ped interiors; neutral; gradual smooth boundary.

C—28 to 60 inches; light brownish gray (10YR 6/2) silt loam; massive; friable; common coarse prominent strong brown (7.5YR 5/6) masses of iron accumulation with diffuse boundaries throughout; very slightly effervescent; slightly alkaline.

Range in Characteristics

Depth to carbonates: 22 to 40 inches
Content of clay in the control section: 25 to 35 percent

Ap horizon:
Value—4 to 6
Chroma—2 to 4

Bt horizon:
Value—5 or 6
Chroma—2 to 4
Texture—silty clay loam or silt loam

C horizon:
Value—5 or 6
Chroma—2 to 4
Texture—silt loam

19D3—Sylvan silty clay loam, 10 to 18 percent slopes, severely eroded

Setting

Landform: Side slopes along upland drainageways
Position on the landform: Shoulders

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Loess

Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Sylvan and similar soils: 100 percent

Similar soils:
- Soils that have a solum more than 40 inches thick

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Tice Series

Taxonomic classification: Fine-silty, mixed, superactive, mesic Fluvaquentic Hapludolls

Typical Pedon

Tice silty clay loam, 0 to 2 percent slopes, occasionally flooded, 1,860 feet south and 45 feet east of the northwest corner of sec. 23, T. 5 N., R. 4 E.

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silty clay loam, brown (10YR 5/3) dry; moderate fine granular structure; friable; few very fine roots; slightly acid; clear smooth boundary.

A—8 to 14 inches; very dark grayish brown (10YR 3/2) silty clay loam, brown (10YR 5/3) dry; weak medium subangular blocky structure parting to weak fine granular; friable; few very fine roots; strongly acid; gradual smooth boundary.

BA—14 to 20 inches; dark grayish brown (10YR 4/2) silty clay loam; weak medium subangular blocky structure; friable; few very fine roots; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; neutral; gradual smooth boundary.

Bw1—20 to 25 inches; brown (10YR 4/3) silty clay loam; moderate medium subangular blocky structure; friable; few very fine roots; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; common fine distinct dark yellowish brown (10YR 4/6) masses of iron accumulation with diffuse boundaries in ped interiors; neutral; gradual smooth boundary.

Bw2—25 to 34 inches; brown (10YR 5/3) silty clay loam; moderate medium and coarse subangular blocky structure; friable; few very fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; many fine distinct dark yellowish brown (10YR 4/6) masses of iron accumulation with diffuse boundaries in ped interiors; neutral; clear smooth boundary.

Bw3—34 to 42 inches; grayish brown (10YR 5/2) and brown (10YR 5/3) silty clay loam; moderate coarse subangular blocky structure; friable; few very fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; common medium distinct dark yellowish brown (10YR 4/6) masses of iron accumulation with diffuse boundaries along root channels and pores; neutral; clear smooth boundary.

BCg—42 to 50 inches; light brownish gray (10YR 6/2) silt loam; weak coarse subangular blocky structure; friable; few very fine roots; many coarse distinct yellowish brown (10YR 5/6) masses of iron accumulation with diffuse boundaries along root channels and pores; slightly alkaline; gradual smooth boundary.

Cg—50 to 60 inches; light brownish gray (2.5Y 6/2) silt loam; massive; friable; few very fine roots; many coarse distinct yellowish brown (10YR 5/6) masses of iron accumulation with diffuse boundaries throughout; very slightly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches
Content of clay in the control section: 22 to 35 percent

Ap or A horizon:
Value—2 or 3
Chroma—1 or 2
Texture—silty clay loam or silt loam

Bw horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—2 to 4
Texture—silty clay loam or silt loam

Cg horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 3
Texture—silt loam or silty clay loam

3284A—Tice silty clay loam, 0 to 2 percent slopes, frequently flooded

Setting

Landform: Rises on flood plains
Position on the landform: Summits

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Parent material: Stream alluvium

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Tice and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
- Soils that have gray colors at a depth of less than 18 inches
- Soils that have a surface layer of silt loam

Dissimilar components:
- The poorly drained Titus soils in the lower positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

8284A—Tice silty clay loam, 0 to 2 percent slopes, occasionally flooded

Setting

Landform: Rises on flood plains
Position on the landform: Summits

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Parent material: Stream alluvium

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Tice and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
- Soils that contain more clay and less sand throughout
- Soils in which the dark surface soil is more than 24 inches thick

Dissimilar components:
- The poorly drained Beaucoup soils in the lower positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section

- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Timula Series

Taxonomic classification: Coarse-silty, mixed, superactive, mesic Typic Eutrudepts

Typical Pedon

Timula silt loam, 10 to 18 percent slopes, eroded, 1,800 feet west and 280 feet north of the southeast corner of sec. 1, T. 5 N., R. 3 E.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak very fine granular structure; friable; common very fine roots; neutral; clear smooth boundary.

Bw—6 to 20 inches; yellowish brown (10YR 5/4) silt loam; weak fine subangular blocky structure; friable; few fine roots; distinct dark grayish brown (10YR 4/2) material from the surface layer filling root channels and pores and few distinct light brownish gray (10YR 6/2) silt coatings on faces of peds and lining pores; slightly effervescent in the lower 2 inches; slightly alkaline; clear smooth boundary.

C1—20 to 27 inches; yellowish brown (10YR 5/4) silt; massive; very friable; few fine roots; slightly effervescent; slightly alkaline; gradual smooth boundary.

C2—27 to 80 inches; silt, 80 percent yellowish brown (10YR 5/4) and 20 percent light brownish gray (10YR 6/2); massive; very friable; strongly effervescent; slightly alkaline.

Range in Characteristics

C horizon:
Value—5 or 6
Chroma—2 to 4

271D2—Timula silt loam, 10 to 18 percent slopes, eroded

Setting

Landform: Side slopes of bluffs along major rivers
Position on the landform: Shoulders and backslopes

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Loess

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Timula and similar soils: 90 percent
Dissimilar components: 10 percent

Similar soils:
- Soils that have more clay in the subsoil
- Soils that have slopes of more than 18 percent

Dissimilar components:
- Fayette soils, which have more clay in the subsoil than the Timula soil; in positions on the landform similar to those of the Timula soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Titus Series

Taxonomic classification: Fine, smectitic, mesic Vertic Endoaquolls

Typical Pedon

Titus silty clay, 0 to 2 percent slopes, occasionally flooded, 2,535 feet north and 240 feet east of the southwest corner of sec. 9, T. 5 N., R. 5 E.

Ap—0 to 8 inches; very dark gray (10YR 3/1) silty clay, dark gray (10YR 4/1) dry; weak medium subangular blocky structure; firm; few very fine roots; neutral; clear smooth boundary.

A—8 to 15 inches; very dark gray (10YR 3/1) silty clay, dark grayish brown (10YR 4/2) dry; weak medium subangular blocky structure; firm; few very fine roots; few fine distinct dark yellowish brown (10YR 4/4) masses of iron accumulation with diffuse boundaries along root channels and pores; neutral; gradual smooth boundary.

Bg1—15 to 20 inches; dark gray (10YR 4/1) silty clay; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; firm; few very fine roots; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few fine distinct dark yellowish brown (10YR 4/4) masses of iron accumulation with diffuse boundaries along root channels and pores; neutral; gradual smooth boundary.

Bg2—20 to 39 inches; dark gray (10YR 4/1) silty clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few fine distinct dark yellowish brown (10YR 4/4) masses of iron accumulation with diffuse boundaries along root channels and pores; neutral; gradual smooth boundary.

Bg3—39 to 51 inches; grayish brown (2.5Y 5/2) silty clay loam; weak coarse prismatic structure parting to weak coarse subangular blocky; firm; few very fine roots; dark gray (10YR 4/1) krotovina; few fine distinct dark yellowish brown (10YR 4/6) masses of iron accumulation with diffuse boundaries along root channels and pores; neutral; gradual smooth boundary.

Cg—51 to 60 inches; light brownish gray (2.5Y 6/2) silty clay loam; massive; firm; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation with diffuse boundaries along pores; neutral.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches
Content of clay in the control section: 35 to 45 percent

Ap or A horizon:
Hue—10YR, 5Y, or N
Value—2 or 3
Chroma—0 to 2
Texture—silty clay loam or silty clay

Bg horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—4 to 6
Chroma—0 to 2
Texture—silty clay loam or silty clay

Cg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2

3404A—Titus silty clay, 0 to 2 percent slopes, frequently flooded

Setting

Landform: Flood plains
Position on the landform: Low-lying areas

Soil Properties and Qualities

Drainage class: Poorly drained
Parent material: Stream alluvium

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Titus and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
- Soils that have less clay in the subsoil

Dissimilar components:
- The somewhat poorly drained Tice soils in the higher positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

8404A—Titus silty clay, 0 to 2 percent slopes, occasionally flooded

Setting

Landform: Flood plains
Position on the landform: Low-lying areas

Soil Properties and Qualities

Drainage class: Poorly drained
Parent material: Stream alluvium

Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Titus and similar soils: 90 percent
Dissimilar components: 10 percent

Similar soils:
- Soils that contain less clay in the subsoil
- Soils that have calcium carbonate in the lower part of the profile

Dissimilar components:
- The somewhat poorly drained Tice soils in the higher positions on the landform
- Very poorly drained soils in depressions

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Virgil Series

Taxonomic classification: Fine-silty, mixed, superactive, mesic Udollic Endoaqualfs

Typical Pedon

Virgil silt loam, 0 to 2 percent slopes, 2,497 feet north and 2,331 feet east of the southwest corner of sec. 18, T. 7 N., R. 2 E.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; common very fine and fine roots; slightly acid; abrupt smooth boundary.

E—9 to 15 inches; dark grayish brown (10YR 4/2) silt loam; weak thick platy structure parting to weak fine and medium granular; friable; common very fine roots; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds and lining pores; common fine distinct yellowish brown (10YR 5/8) and few fine distinct brown (7.5YR 4/4) masses of iron accumulation with diffuse boundaries in ped interiors; slightly acid; clear smooth boundary.

Bt—15 to 21 inches; silty clay loam, 70 percent brown (10YR 4/3) and 30 percent grayish brown (10YR 5/2); moderate fine and medium subangular blocky structure; friable; common very fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common fine distinct yellowish brown (10YR 5/8) and few fine prominent yellowish red (5YR 4/6) masses of iron accumulation with diffuse boundaries in ped interiors and along pores; moderately acid; clear smooth boundary.

Btg1—21 to 29 inches; grayish brown (10YR 5/2) silty clay loam; moderate medium subangular blocky structure; firm; few very fine roots; few distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common fine distinct yellowish brown (10YR 5/8) and common fine prominent yellowish red (5YR 4/6) masses of iron accumulation with diffuse boundaries along pores; moderately acid; clear smooth boundary.

Btg2—29 to 41 inches; grayish brown (10YR 5/2) silty clay loam; moderate medium subangular blocky structure; firm; few distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common medium distinct yellowish brown (10YR 5/8) and few fine distinct yellowish red (5YR 4/6) masses of iron accumulation with diffuse boundaries along pores; moderately acid; clear smooth boundary.

2Btg3—41 to 50 inches; grayish brown (10YR 5/2) clay loam; moderate medium and coarse subangular blocky structure; firm; few distinct dark grayish brown (10YR 4/2) clay films lining pores; common medium distinct yellowish brown (10YR 5/8) and few fine prominent yellowish red (5YR 4/6) masses of iron accumulation with diffuse boundaries along pores; moderately acid; clear smooth boundary.

2BCg—50 to 63 inches; grayish brown (10YR 5/2) sandy loam and sandy clay loam; weak coarse subangular blocky structure; friable; few distinct dark grayish brown (10YR 4/2) clay films lining pores; common coarse distinct yellowish brown (10YR 5/8) masses of iron accumulation with diffuse boundaries along pores and ped surfaces; about 2 percent fine gravel; moderately acid.

Range in Characteristics

Thickness of the loess: 40 to 60 inches

Ap horizon:
Value—2 or 3
Chroma—1 or 2

E horizon:
Value—4 to 6
Chroma—1 or 2

Bt and Btg horizons:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 4

2Btg horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture—clay loam or silty clay loam

104A—Virgil silt loam, 0 to 2 percent slopes

Setting

Landform: Rises on stream terraces
Position on the landform: Summits

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Parent material: Loess or other silty material and the underlying outwash

Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Virgil and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
- Soils that have less sand in the lower part of the subsoil
- Soils that have a surface layer more than 9 inches thick

Dissimilar components:
- The well drained St. Charles soils in the more sloping positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Wakeland Series

Taxonomic classification: Coarse-silty, mixed, superactive, nonacid, mesic Aeric Fluvaquents

Typical Pedon

Wakeland silt loam, 0 to 2 percent slopes, frequently flooded, 1,690 feet east and 1,610 feet south of the northwest corner of sec. 11, T. 6 N., R. 5 E.

Ap—0 to 8 inches; brown (10YR 4/3) silt loam, brown (10YR 5/3) dry; weak fine granular structure; friable; many very fine roots; slightly alkaline; abrupt smooth boundary.

Cg1—8 to 30 inches; dark grayish brown (10YR 4/2) silt loam with thin lenses of brown (10YR 5/3) silt loam; massive with thick bedding planes; friable; common very fine roots; dark brown (10YR 3/3) organic coatings lining root channels and pores; few medium prominent strong brown (7.5YR 4/6) masses of iron accumulation with diffuse boundaries along root channels; slightly alkaline; clear smooth boundary.

Cg2—30 to 58 inches; silt loam, 70 percent dark grayish brown (10YR 4/2) and 30 percent brown (10YR 4/3); massive with thick bedding planes; friable; few very fine roots; common distinct dark brown (10YR 3/3) organic coatings lining root channels and pores; common medium prominent strong brown (7.5YR 4/6) masses of iron accumulation with diffuse boundaries along root channels; slightly alkaline; clear smooth boundary.

Cg3—58 to 80 inches; brown (10YR 4/3) and dark grayish brown (10YR 4/2) silt loam; massive with thick bedding planes; friable; few distinct dark brown (10YR 3/3) organic coatings lining pores; many medium prominent strong brown (7.5YR 4/6) masses of iron accumulation with diffuse boundaries along pores; slightly alkaline.

Range in Characteristics

Cg horizon:
Value—4 or 5
Chroma—2 or 3

3333A—Wakeland silt loam, 0 to 2 percent slopes, frequently flooded

Setting

Landform: Rises on flood plains
Position on the landform: Summits

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Parent material: Stream alluvium

Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Wakeland and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
- Soils that have gray colors at a depth of more than 24 inches
- Soils that have a buried dark surface layer at a depth of 20 inches or more

Dissimilar components:
- The poorly drained Sawmill soils in the lower positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Worthen Series

Taxonomic classification: Fine-silty, mixed, superactive, mesic Cumulic Hapludolls

Typical Pedon

Worthen silt loam, 2 to 5 percent slopes, 1,800 feet east and 400 feet north of the southwest corner of sec. 5, T. 5 N., R. 5 E.

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; common very fine roots; moderately acid; clear smooth boundary.

A—8 to 19 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak very fine subangular blocky structure; friable; common very fine roots; slightly acid; clear smooth boundary.

AB—19 to 25 inches; dark brown (10YR 3/3) silt loam, brown (10YR 5/3) dry; moderate very fine subangular blocky structure; friable; common very fine and few fine roots; many distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; slightly acid; clear smooth boundary.

Bw1—25 to 31 inches; brown (10YR 4/3) silt loam; moderate fine subangular blocky structure; friable; common very fine roots; few fine black (10YR 2/1) manganese concretions with sharp boundaries in ped interiors; many distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; neutral; gradual smooth boundary.

Bw2—31 to 40 inches; dark yellowish brown (10YR 4/4) silt loam; moderate medium subangular blocky structure; friable; common very fine roots; common fine black (10YR 2/1) manganese concretions with sharp boundaries in ped interiors; neutral; gradual smooth boundary.

Bw3—40 to 50 inches; silt loam, 70 percent dark yellowish brown (10YR 4/4) and 30 percent brown (10YR 4/3); moderate medium subangular blocky structure; friable; few very fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; common fine black (10YR 2/1) manganese concretions with sharp boundaries in ped interiors; neutral; gradual smooth boundary.

BC—50 to 60 inches; silt loam, 70 percent dark yellowish brown (10YR 4/4) and 30 percent dark grayish brown (10YR 4/2); weak medium subangular blocky structure; friable; few very fine roots; few distinct dark brown (10YR 3/3) organic coatings on faces of peds; slightly acid.

Range in Characteristics

Thickness of the mollic epipedon: 24 to 36 inches

Bw horizon:
Chroma—3 or 4

37B—Worthen silt loam, 2 to 5 percent slopes

Setting

Landform: Alluvial fans
Position on the landform: Footslopes

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Slope alluvium

Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Worthen and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
- Soils that have a dark surface layer
- Soils that have more sand in the subsoil

Dissimilar components:
- The somewhat poorly drained Tice and Orion soils,

which are subject to flooding; in positions on the landform downslope from those of the Worthen soil
• Soils that are subject to flooding; in areas at the base of slopes

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

• “Agronomy” section
• “Wildlife Habitat” section
• “Engineering” section
• “Soil Properties” section

References

American Association of State Highway and Transportation Officials (AASHTO). 2000. Standard specifications for transportation materials and methods of sampling and testing. 20th edition, 2 volumes.

American Society for Testing and Materials (ASTM). 2001. Standard classification of soils for engineering purposes. ASTM Standard D 2487–00.

Clark, Helen Hollandsworth. 1969. A history of Fulton County, Illinois, in Spoon River country, 1818–1968.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS–79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. February 24, 1995. Hydric soils of the United States.

Fulton County Historical and Geological Society. 1879. History of Fulton County, Illinois.

Haynes, Ronnie J., and W.D. Klimstra. 1975. Illinois lands surface mined for coal.

Hudson, Berman D. 1992. The soil survey as paradigm-based science. Soil Science Society of America Journal, volume 56, number 3, pages 836–41.

Hurt, G.W., P.M. Whited, and R.F. Pringle, editors. Version 4.0, 1998. Field indicators of hydric soils in the United States.

Iverson, Louis R., Richard L. Oliver, Dennis P. Tucker, Paul G. Risser, Christopher D. Burnett, and Ronald G. Rayburn. 1989. Forest resources of Illinois: An atlas and analysis of spatial and temporal trends. Illinois Natural History Survey Special Publication II.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Reinersten, David L. 1988. A guide to the geology of the Canton area, Fulton County. Illinois State Geological Survey, Department of Energy and Natural Resources, Field Trip Guidebook 1988B.

Reinersten, David L., Russell J. Jacobson, Myrna M. Killey, Robert S. Nelson, and Phillip C. Reed. 1993. Guide to the geology of the Lewistown-Spoon River area. Illinois State Geological Survey, Department of Energy and Natural Resources, Field Trip Guidebook 1993B.

Smith, R.S., E.E. DeTurk, F.C. Bauer, and L.H. Smith. 1932. Fulton County soils. University of Illinois, Agricultural Experiment Station Soil Report 51.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.

Soil Survey Staff. 1998. Keys to soil taxonomy. 8th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y–87–1.

United States Department of Agriculture. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210.

Glossary

Ablation till. Loose, permeable till deposited during the final downwasting of glacial ice. Lenses of crudely sorted sand and gravel are common.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvial fan. The fanlike deposit of a stream where it issues from a gorge upon a plain or of a tributary stream near or at its junction with its main stream.

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.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Aspect. The direction in which a slope faces.

Association, soil. A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Backslope. The position that forms the steepest and generally linear, middle portion of a hillslope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.

Basal area. The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.

Basal till. Compact glacial till deposited beneath the ice.

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.

Bedrock-controlled topography. A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.

Bench terrace. A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Blowout. A shallow depression from which all or most of the soil material has been removed by the wind. A blowout has a flat or irregular floor formed by a resistant layer or by an accumulation of pebbles or cobbles. In some blowouts the water table is exposed.

Board foot. A unit of measurement of the wood in lumber, logs, or trees. The amount of wood in a board 1 foot wide, 1 foot long, and 1 inch thick before finishing.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Breast height. An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Canopy. The leafy crown of trees or shrubs.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or “chain,” of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Catsteps. Very small, irregular terraces on steep hillsides, especially in pasture, formed by the trampling of cattle or the slippage of saturated soil.

Channery soil material. Soil material that has, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Chemical treatment. Control of unwanted vegetation through the use of chemicals.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay 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.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Clearcut. A method of forest harvesting that removes the entire stand of trees in one cutting. Reproduction is achieved artificially or by natural seeding from adjacent stands.

Climax plant community. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Closed depression. A low area completely surrounded by higher ground and having no natural outlet.

Coarse textured soil. Sand or loamy sand.

COLE (coefficient of linear extensibility). See Linear extensibility.

Colluvium. Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are 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.”

Consolidated sandstone. Sandstone that disperses within a few hours when fragments are placed in water. The fragments are extremely hard or very hard when dry, are not easily crushed, and cannot be textured by the usual field method.

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.

Culmination of the mean annual increment (CMAI). The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of 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.

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.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Erosion pavement. A layer of gravel or stones that remains on the surface after fine particles are removed by sheet or rill erosion.

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.

Extrusive rock. Igneous rock derived from deep-seated molten matter (magma) emplaced on the earth’s surface.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fast intake (in tables). The rapid movement of water into the soil.

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

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called ***normal field capacity, normal moisture capacity,*** or ***capillary capacity***.

Fine textured soil. Sandy clay, silty clay, or clay.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

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.

Footslope. The position that forms the inner, gently inclined surface at the base of a hillslope. In profile, footslopes are commonly concave. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

Forb. Any herbaceous plant not a grass or a sedge.

Forest cover. All trees and other woody plants (underbrush) covering the ground in a forest.

Forest type. A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots.

When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gilgai. Commonly, a succession of microbasins and microknolls in nearly level areas or of microvalleys and microridges parallel with the slope. Typically, the microrelief of clayey soils that shrink and swell considerably with changes in moisture content.

Glacial drift. Pulverized and other rock material transported by glacial ice and then deposited. Also, the sorted and unsorted material deposited by streams flowing from glaciers.

Glacial outwash. Gravel, sand, and silt, commonly stratified, deposited by glacial meltwater.

Glacial till. Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Glaciated uplands. Land areas that were previously covered by continental or alpine glaciers and that are at a higher elevation than the flood plains.

Glaciofluvial deposits. Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.

Glaciolacustrine deposits. Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are interbedded or laminated.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Graded stripcropping. Growing crops in strips that grade toward a protected waterway.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water. Water filling all the unblocked pores of the material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Gypsum. A mineral consisting of hydrous calcium sulfate.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Head out. To form a flower head.

Head slope. A geomorphic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainageway. The overland waterflow is converging.

Heavy metal. Inorganic substances that are solid at ordinary temperatures and are not soluble in water. They form oxides and hydroxides that are basic. Examples are copper, iron, cadmium, zinc, manganese, lead, and arsenic.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.

High-residue crops. Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Hill. A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Igneous rock. Rock formed by solidification from a molten or partially molten state. Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Interfluve. An elevated area between two drainageways that sheds water to those drainageways.

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:

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Karst (topography). The relief of an area underlain by limestone that dissolves in differing degrees, thus forming numerous depressions or small basins.

Knoll. A small, low, rounded hill rising above adjacent landforms.

K_{sat}. Saturated hydraulic conductivity. (See Permeability.)

Lacustrine deposit. Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Landslide. The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

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.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

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.

Merchantable trees. Trees that are of sufficient size to be economically processed into wood products.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Microhigh. An area that is 2 to 12 inches higher than the adjacent microlow.

Microlow. An areas that is 2 to 12 inches lower than the adjacent microhigh.

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 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).

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Mudstone. Sedimentary rock formed by induration of silt and clay in approximately equal amounts.

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.

Nose slope. A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent.

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

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

Oxbow. The horseshoe-shaped channel of a former meander, remaining after the stream formed a cutoff across a narrow meander neck.

Paleoterrace. An erosional remnant of a terrace that retains the surface form and alluvial deposits of its origin but was not emplaced by, and commonly does not grade to, a present-day stream or drainage network.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, ***hardpan, fragipan, claypan, plowpan,*** and ***traffic pan***.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedisediment. A thin layer of alluvial material that mantles an erosion surface and has been transported to its present position from higher lying areas of the erosion surface.

Pedon. The smallest volume that can be called “a soil.” A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The movement of water through the soil.

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:

Impermeable	less than 0.0015 inch
Very slow	0.0015 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid or very rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning. Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed 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.

Regeneration. The new growth of a natural plant community, developing from seed.

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.

Rill. A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Riser. The relatively short, steeply sloping area below a terrace tread that grades to a lower terrace tread or base level.

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.

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.

Saline soil. A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saprolite. Unconsolidated residual material underlying the soil and grading to hard bedrock below.

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.

Second bottom. The first terrace above the normal flood plain (or first bottom) of a river.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

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

Shoulder. The position that forms the uppermost inclined surface near the top of a hillslope. It is a transition from backslope to summit. The surface is dominantly convex in profile and erosional in origin.

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.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silica-sesquioxide ratio. The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

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

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

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.

Sinkhole. A depression in the landscape where limestone has been dissolved.

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.

Skid trails. Pathways along which logs are dragged to a common site for loading onto a logging truck.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

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.

Sodic (alkali) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Sodicity. The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of Na^{+} to Ca^{++} + Mg^{++}. The degrees of sodicity and their respective ratios are:

Slight	less than 13:1
Moderate	13-30:1
Strong	more than 30:1

Sodium adsorption ratio (SAR). A measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration.

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief and by the passage of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Spoil bank. Rock debris, banks, and earthy dump deposits resulting from the excavation of ditches and strip mines.

Stone line. A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

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.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Strath terrace. A surface cut formed by the erosion of hard or semiconsolidated bedrock and thinly mantled with stream deposits.

Stream channel. The hollow bed where a natural stream of surface water flows or may flow; the deepest or central part of the bed, formed by the main current and covered more or less continuously by water.

Stream terrace. One of a series of platforms in a stream valley, flanking and more or less parallel to the stream channel. It originally formed near the level of the stream and is the dissected remnants of an abandoned flood plain, streambed, or valley floor that were produced during a former stage of erosion or deposition.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—***platy*** (laminated), ***prismatic*** (vertical axis of aggregates longer than horizontal), ***columnar*** (prisms with rounded tops), ***blocky*** (angular or subangular), and ***granular***. ***Structureless*** soils are either ***single grain*** (each grain by itself, as in dune sand) or ***massive*** (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

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

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summit. The topographically highest position of a hillslope. It has a nearly level (planar or only slightly convex) surface.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are ***sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,*** and ***clay***. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material that is too thin for the specified use.

Till plain. An extensive area of nearly level to undulating soils underlain by glacial till.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope. The position that forms the gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Trafficability. The degree to which a soil is capable of supporting vehicular traffic across a wide range in soil moisture conditions.

Tread. The relatively flat terrace surface that was cut or built by stream or wave action.

Understory. Any plants in a forest community that grow to a height of less than 5 feet.

Upland. Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Valley. An elongated depressional area primarily developed by stream action.

Valley fill. In glaciated regions, material deposited in stream valleys by glacial meltwater. In nonglaciated regions, alluvium deposited by heavily loaded streams.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Varve. A sedimentary layer or a lamina or sequence of laminae deposited in a body of still water within a year. Specifically, a thin pair of graded glaciolacustrine layers seasonally deposited, usually by meltwater streams, in a glacial lake or other body of still water in front of a glacier.

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.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Windthrow. The uprooting and tipping over of trees by the wind.

Tables

Table 1.--Temperature and Precipitation

(Recorded in the period 1961-90 at Havana, Illinois)

Month	Temperature: Average daily maximum	Temperature: Average daily minimum	Temperature: Average	Temperature: 2 years in 10 will have-- Maximum temperature higher than--	Temperature: 2 years in 10 will have-- Minimum temperature lower than--	Temperature: Average number of growing degree days*	Precipitation: Average	Precipitation: 2 years in 10 will have-- Less than--	Precipitation: 2 years in 10 will have-- More than--	Precipitation: Average number of days with 0.10 inch or more	Precipitation: Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January----	32.8	14.5	23.7	62	-17	1	1.78	0.64	2.72	4	7.5
February---	37.6	18.5	28.1	68	-14	3	1.70	1.00	2.44	4	7.1
March------	51.5	30.7	41.1	81	7	44	3.03	1.72	4.19	6	3.4
April------	64.8	41.6	53.2	89	22	171	3.48	1.73	4.99	6	.7
May--------	74.4	50.9	62.6	93	33	390	3.87	2.04	5.48	7	.0
June-------	84.5	61.2	72.8	99	45	673	3.67	1.61	5.43	5	.0
July-------	88.6	65.1	76.8	101	50	824	4.03	1.92	5.85	6	.0
August-----	85.9	62.4	74.1	99	47	746	3.39	1.60	4.92	5	.0
September--	79.7	54.5	67.1	96	34	512	3.81	1.54	5.72	6	.0
October----	66.9	42.6	54.8	88	23	201	2.95	1.55	4.37	5	.1
November---	51.4	32.3	41.8	76	9	39	2.88	1.24	4.28	5	1.4
December---	37.6	20.7	29.2	66	-11	5	2.74	1.34	3.95	5	5.8
Yearly:											
Average---	63.0	41.3	52.1	---	---	---	---	---	---	---	---
Extreme---	106	-26	---	104	-19	---	---	---	---	---	---
Total-----	---	---	---	---	---	3,611	37.32	30.08	43.31	64	26.0

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

Table 2.--Freeze Dates in Spring and Fall

(Recorded in the period 1961-90 at Havana, Illinois)

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--	Apr. 11	Apr. 15	Apr. 29
2 years in 10 later than--	Apr. 7	Apr. 12	Apr. 25
5 years in 10 later than--	Mar. 29	Apr. 5	Apr. 16
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 20	Oct. 9	Sept. 28
2 years in 10 earlier than--	Oct. 25	Oct. 15	Oct. 3
5 years in 10 earlier than--	Nov. 5	Oct. 26	Oct. 11

Table 3.--Growing Season

(Recorded in the period 1961-90 at Havana, Illinois)

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	199	186	160
8 years in 10	206	191	166
5 years in 10	219	202	178
2 years in 10	232	213	190
1 year in 10	238	219	197

Table 4.--Classification of the Soils

(An asterisk in the first column indicates a taxadjunct to the series. See text for a description of those characteristics that are outside the range of the series)

Soil name	Family or higher taxonomic class
Ambraw	Fine-loamy, mixed, superactive, mesic Fluvaquentic Endoaquolls
*Assumption	Fine-silty, mixed, superactive, mesic Oxyaquic Argiudolls
Atlas	Fine, smectitic, mesic Aeric Chromic Vertic Epiaqualfs
Batavia	Fine-silty, mixed, superactive, mesic Mollic Hapludalfs
Beaucoup	Fine-silty, mixed, superactive, mesic Fluvaquentic Endoaquolls
Blyton	Coarse-silty, mixed, superactive, nonacid, mesic Oxyaquic Udifluvents
Breeds	Fine-silty, mixed, superactive, mesic Aquic Hapludolls
Camden	Fine-silty, mixed, superactive, mesic Typic Hapludalfs
Chelsea	Mixed, mesic Lamellic Udipsamments
Clarksdale	Fine, smectitic, mesic Udollic Endoaqualfs
Coot	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Aquic Argiudolls
Copperas	Fine-silty, mixed, superactive, mesic Fluvaquentic Endoaquolls
Dakota	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Typic Argiudolls
Denny	Fine, smectitic, mesic Mollic Albaqualfs
Drury	Fine-silty, mixed, superactive, mesic Dystric Eutrudepts
Elburn	Fine-silty, mixed, superactive, mesic Aquic Argiudolls
Elco	Fine-silty, mixed, superactive, mesic Oxyaquic Hapludalfs
*Elkhart	Fine-silty, mixed, superactive, mesic Typic Argiudolls
Fayette	Fine-silty, mixed, superactive, mesic Typic Hapludalfs
Greenbush	Fine-silty, mixed, superactive, mesic Mollic Hapludalfs
Hickory	Fine-loamy, mixed, active, mesic Typic Hapludalfs
Huntsville	Fine-silty, mixed, superactive, mesic Cumulic Hapludolls
Ipava	Fine, smectitic, mesic Aquic Argiudolls
Kendall	Fine-silty, mixed, superactive, mesic Aeric Endoaqualfs
Keomah	Fine, smectitic, mesic Aeric Endoaqualfs
*La Hogue	Fine-loamy, mixed, superactive, mesic Aquic Argiudolls
Lawson	Fine-silty, mixed, superactive, mesic Aquic Cumulic Hapludolls
Lenzburg	Fine-loamy, mixed, active, calcareous, mesic Alfic Udarents
Lenzlo	Fine-loamy, mixed, active, calcareous, mesic Mollic Endoaquents
Lenzwheel	Fine-loamy, mixed, active, calcareous, mesic Alfic Udarents
Littleton	Fine-silty, mixed, superactive, mesic Aquic Cumulic Hapludolls
Marbletown	Fine-loamy, mixed, superactive, mesic Typic Argiudolls
Marseilles	Fine-silty, mixed, superactive, mesic Typic Hapludalfs
Martinsville	Fine-loamy, mixed, active, mesic Typic Hapludalfs
Mudhen	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Typic Endoaquolls
Navlys	Fine-silty, mixed, superactive, mesic Typic Hapludalfs
Onarga	Coarse-loamy, mixed, superactive, mesic Typic Argiudolls
Orion	Coarse-silty, mixed, superactive, nonacid, mesic Aquic Udifluvents
Orthents	Fine-silty, mixed, active, nonacid, mesic Aquic Udorthents
Osco	Fine-silty, mixed, superactive, mesic Typic Argiudolls
*Plano	Fine-silty, mixed, superactive, mesic Typic Argiudolls
Quiver	Fine-silty, mixed, superactive, nonacid, mesic Mollic Fluvaquents
Raddle	Fine-silty, mixed, superactive, mesic Typic Hapludolls
Radford	Fine-silty, mixed, superactive, mesic Fluvaquentic Hapludolls
Rapatee	Fine-silty, mixed, superactive, nonacid, mesic Alfic Udarents
Rozetta	Fine-silty, mixed, superactive, mesic Typic Hapludalfs
Rushville	Fine, smectitic, mesic Typic Albaqualfs
Sable	Fine-silty, mixed, superactive, mesic Typic Endoaquolls
Sarpy	Mixed, mesic Typic Udipsamments
Sawmill	Fine-silty, mixed, superactive, mesic Cumulic Endoaquolls
Schuline	Fine-loamy, mixed, superactive, calcareous, mesic Typic Udorthents
Seaton	Fine-silty, mixed, superactive, mesic Typic Hapludalfs
Sepo	Fine-silty, mixed, superactive, mesic Fluvaquentic Endoaquolls
Shaffton	Fine-loamy, mixed, superactive, mesic Fluvaquentic Hapludolls
Sparta	Sandy, mixed, mesic Entic Hapludolls
St. Charles	Fine-silty, mixed, superactive, mesic Typic Hapludalfs

Table 4.--Classification of the Soils--Continued

Soil name	Family or higher taxonomic class
Sylvan	Fine-silty, mixed, superactive, mesic Typic Hapludalfs
Tice	Fine-silty, mixed, superactive, mesic Fluvaquentic Hapludolls
Timula	Coarse-silty, mixed, superactive, mesic Typic Eutrudepts
Titus	Fine, smectitic, mesic Vertic Endoaquolls
Virgil	Fine-silty, mixed, superactive, mesic Udollic Endoaqualfs
Wakeland	Coarse-silty, mixed, superactive, nonacid, mesic Aeric Fluvaquents
Worthen	Fine-silty, mixed, superactive, mesic Cumulic Hapludolls

Table 5.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
7C3	Atlas silty clay loam, 5 to 10 percent slopes, severely eroded	255	*
7D3	Atlas silty clay loam, 10 to 18 percent slopes, severely eroded	543	0.1
8D2	Hickory silt loam, 10 to 18 percent slopes, eroded	2,369	0.4
8E2	Hickory loam, 18 to 25 percent slopes, eroded	20,038	3.5
8F	Hickory silt loam, 18 to 35 percent slopes	36,182	6.4
8G	Hickory silt loam, 35 to 60 percent slopes	14,553	2.6
16A	Rushville silt loam, 0 to 2 percent slopes	239	*
17A	Keomah silt loam, 0 to 2 percent slopes	20,259	3.6
17B	Keomah silt loam, 2 to 5 percent slopes	106	*
19D3	Sylvan silty clay loam, 10 to 18 percent slopes, severely eroded	7,365	1.3
37B	Worthen silt loam, 2 to 5 percent slopes	1,527	0.3
43A	Ipava silt loam, 0 to 2 percent slopes	45,608	8.2
45A	Denny silt loam, 0 to 2 percent slopes	664	0.1
68A	Sable silty clay loam, 0 to 2 percent slopes	16,043	2.8
75B	Drury silt loam, 2 to 5 percent slopes	709	0.2
75C2	Drury silt loam, 5 to 10 percent slopes, eroded	1,506	0.3
86B	Osco silt loam, 2 to 5 percent slopes	16,922	3.1
86C2	Osco silt loam, 5 to 10 percent slopes, eroded	3,522	0.6
88B	Sparta loamy fine sand, 1 to 7 percent slopes	203	*
102A	La Hogue loam, 0 to 2 percent slopes	196	*
104A	Virgil silt loam, 0 to 2 percent slopes	123	*
105B2	Batavia silt loam, 2 to 5 percent slopes, eroded	86	*
119D2	Elco silt loam, 10 to 18 percent slopes, eroded	6,355	1.1
119E2	Elco silt loam, 18 to 25 percent slopes, eroded	4,839	0.9
134C2	Camden silt loam, 5 to 10 percent slopes, eroded	1,707	0.3
134D2	Camden silt loam, 10 to 18 percent slopes, eroded	1,250	0.2
134E2	Camden silt loam, 18 to 25 percent slopes, eroded	863	0.2
150B	Onarga fine sandy loam, 2 to 5 percent slopes	372	*
198A	Elburn silt loam, 0 to 2 percent slopes	267	*
199B	Plano silt loam, 2 to 5 percent slopes	632	0.1
242A	Kendall silt loam, 0 to 2 percent slopes	554	0.1
243B	St. Charles silt loam, 2 to 5 percent slopes	1,502	0.3
257A	Clarksdale silt loam, 0 to 2 percent slopes	16,441	2.9
259C2	Assumption silt loam, 5 to 10 percent slopes, eroded	507	0.1
271D2	Timula silt loam, 10 to 18 percent slopes, eroded	441	0.1
274E2	Seaton silt loam, 18 to 25 percent slopes, eroded	5,064	0.9
274F	Seaton silt loam, 18 to 35 percent slopes	4,020	0.7
274G	Seaton silt loam, 35 to 60 percent slopes	1,184	0.2
279B	Rozetta silt loam, 2 to 5 percent slopes	74,905	13.4
279C2	Rozetta silt loam, 5 to 10 percent slopes, eroded	44,842	8.0
279C3	Rozetta silty clay loam, 5 to 10 percent slopes, severely eroded	578	0.1
280B2	Fayette silt loam, 2 to 5 percent slopes, eroded	4,416	0.8
280C2	Fayette silt loam, 5 to 10 percent slopes, eroded	8,030	1.4
280D2	Fayette silt loam, 10 to 18 percent slopes, eroded	9,437	1.7
280E2	Fayette silt loam, 18 to 25 percent slopes, eroded	2,289	0.4
379A	Dakota loam, 0 to 2 percent slopes	205	*
379B	Dakota loam, 2 to 5 percent slopes	438	0.1
430B	Raddle silt loam, 2 to 5 percent slopes	1,723	0.3
536	Dumps, mine	1,366	0.2
549F	Marseilles silt loam, 18 to 35 percent slopes	1,706	0.3
549G	Marseilles silt loam, 35 to 60 percent slopes	2,229	0.4
558A	Breeds silty clay loam, 0 to 2 percent slopes	116	*
567B2	Elkhart silty clay loam, 2 to 5 percent slopes, eroded	17	*
567C2	Elkhart silty clay loam, 5 to 10 percent slopes, eroded	159	*
570B	Martinsville loam, 2 to 5 percent slopes	374	*
596B	Marbletown silt loam, 2 to 5 percent slopes	578	0.1
630C3	Navlys silty clay loam, 5 to 10 percent slopes, severely eroded	11,449	2.0
632A	Copperas silty clay loam, 0 to 2 percent slopes	42	*
675B	Greenbush silt loam, 2 to 5 percent slopes	9,679	1.8
779B	Chelsea loamy fine sand, 1 to 7 percent slopes	233	*
779D	Chelsea loamy fine sand, 7 to 20 percent slopes	274	*
801B	Orthents, silty, undulating	1,388	0.3

See footnote at end of table.

Table 5.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
823B	Schuline silty clay loam, 1 to 7 percent slopes	1,719	0.3
823D	Schuline silty clay loam, 7 to 20 percent slopes	277	*
865	Pits, gravel	522	0.1
871B	Lenzburg silt loam, 1 to 7 percent slopes	13,575	2.4
871D	Lenzburg silty clay loam, 7 to 20 percent slopes	7,195	1.3
871G	Lenzburg silty clay loam, 20 to 60 percent slopes	13,232	2.3
872B	Rapatee silty clay loam, 2 to 5 percent slopes	1,770	0.3
876B	Lenzwheel silt loam, 1 to 7 percent slopes	4,879	0.9
876D	Lenzwheel silty clay loam, 7 to 20 percent slopes	3,188	0.6
876G	Lenzwheel silty clay loam, 20 to 60 percent slopes	2,538	0.4
3070A	Beaucoup silty clay loam, 0 to 2 percent slopes, frequently flooded	7,231	1.3
3074A	Radford silt loam, 0 to 2 percent slopes, frequently flooded	573	0.1
3077A	Huntsville silt loam, 0 to 2 percent slopes, frequently flooded	2,024	0.4
3107A	Sawmill silty clay loam, 0 to 2 percent slopes, frequently flooded	3,151	0.6
3284A	Tice silty clay loam, 0 to 2 percent slopes, frequently flooded	8,851	1.6
3333A	Wakeland silt loam, 0 to 2 percent slopes, frequently flooded	13,909	2.5
3404A	Titus silty clay, 0 to 2 percent slopes, frequently flooded	856	0.2
3415A	Orion silt loam, 0 to 2 percent slopes, frequently flooded	4,421	0.8
3451A	Lawson silt loam, 0 to 2 percent slopes, frequently flooded	11,413	2.0
3634A	Blyton silt loam, 0 to 2 percent slopes, frequently flooded	2,390	0.4
3641L	Quiver silty clay loam, 0 to 2 percent slopes, frequently flooded, long duration	2,396	0.4
7081A	Littleton silt loam, 0 to 2 percent slopes, rarely flooded	577	0.1
8070A	Beaucoup silty clay loam, 0 to 2 percent slopes, occasionally flooded	5,162	0.9
8092B	Sarpy sand, 1 to 7 percent slopes, occasionally flooded	102	*
8183A	Shaffton clay loam, 0 to 2 percent slopes, occasionally flooded	254	*
8284A	Tice silty clay loam, 0 to 2 percent slopes, occasionally flooded	3,237	0.6
8302A	Ambraw clay loam, 0 to 2 percent slopes, occasionally flooded	563	0.1
8404A	Titus silty clay, 0 to 2 percent slopes, occasionally flooded	11,518	2.0
8415A	Orion silt loam, 0 to 2 percent slopes, occasionally flooded	1,694	0.3
8595A	Coot loam, 0 to 2 percent slopes, occasionally flooded	277	*
8608A	Mudhen clay loam, 0 to 2 percent slopes, occasionally flooded	179	*
8611A	Sepo silty clay loam, 0 to 2 percent slopes, occasionally flooded	970	0.2
8875B	Lenzlo silty clay loam, 1 to 7 percent slopes, occasionally flooded	1,031	0.2
9017A	Keomah silt loam, terrace, 0 to 2 percent slopes	590	0.1
9068A	Sable silty clay loam, terrace, 0 to 2 percent slopes	152	*
9257A	Clarksdale silt loam, terrace, 0 to 2 percent slopes	321	*
9279B	Rozetta silt loam, terrace, 2 to 5 percent slopes	1,870	0.3
9279C	Rozetta silt loam, terrace, 5 to 10 percent slopes, eroded	1,022	0.2
W	Water	9,905	1.8
	Total	557,023	100.0

* Less than 0.1 percent.

United States Department of Agriculture

Natural Resources Conservation Service

In cooperation with the Illinois Agricultural Experiment Station

Soil Survey of Fulton County, Illinois

Part II

How To Use This Soil Survey

This survey is divided into three parts. Part I includes general information about the survey area; descriptions of the general soil map units, detailed soil map units, and soil series in the area; and a description of how the soils formed. Part II describes the use and management of the soils and the major soil properties. This part may be updated as further information about soil management becomes available. Part III includes the maps.

On the **general soil map**, the survey area is divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

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

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** in Part I of this survey, which lists the map units by symbol and name and shows the page where each map unit is described.

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

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

Major fieldwork for this soil survey was completed in 1994. Soil names and descriptions were approved in 1997. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1994. This survey was made cooperatively by the Natural Resources Conservation Service; the United States Department of Agriculture, Forest Service; and the Illinois Agricultural Experiment Station. The Illinois Department of Natural Resources provided a soil scientist to assist with the fieldwork. The survey is part of the technical assistance furnished to the Fulton County Soil and Water Conservation District.

Cover: Overlooking the Rozetta-Keomah-Camden association on the flood plain along the Spoon River in Fulton County, Illinois.

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

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in cooperation with
the Illinois Agricultural Experiment Station

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

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops, pasture and hayland, and forestland; 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.

Interpretive ratings help engineers, planners, and others understand how soil properties influence important nonagricultural uses, such as building site development and construction materials. The ratings indicate the most restrictive soil features affecting the suitability of the soils for these uses.

Soils are rated in their natural state. No unusual modification of the soil site or material is made other than that which is considered normal practice for the rated use. Even though soils may have limitations, it is important to remember that engineers and others can modify soil features or can design or adjust the plans for a structure to compensate for most of the limitations. Most of these practices, however, are costly. The final decision in selecting a site for a particular use generally involves weighing the costs of site preparation and maintenance.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

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

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

Climate information for the survey area is provided in table 1, table 2, and table 3 at the back of Part II. The classification and extent of the soils in the survey area are shown in table 4 and table 5, respectively.

Agronomy

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

Planners of management systems for individual fields or farms should consider obtaining specific information from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

A total of 309,857 acres in Fulton County is cropland. The major row crops are corn and soybeans. Wheat is the major small grain crop grown.

The soils in Fulton County have good potential for continued crop production, especially if the latest crop production technology is applied. This soil survey can be used as a guide for applying the latest crop production technologies.

Cropland Management Considerations

The major management concerns affecting the use of soils for cropland in the county are crusting, flooding, poor tilth, water erosion, and wetness. Excessive permeability, low available water capacity, ponding, and wind erosion are additional management concerns.

Crusting is a potential concern on about 87 percent of the cropland in the county. A crust can form during periods of intense rainfall, when flowing water or raindrops break down soil structural units, moving clay downward and leaving a concentration of sand and silt particles on the soil surface. Crusts are hard when dry and reduce the rate of water infiltration, increase the runoff rate, restrict seedling emergence, and reduce the diffusion of oxygen to seedlings. Soils susceptible to crusting generally have a low average content of organic matter in the surface layer. Keomah and Rozetta soils are examples.

The potential of flooding during the growing season is a concern on about 26 percent of the cropland in the county. Some soils in areas on flood plains that are not protected from flooding, such as Wakeland and Sawmill soils, are flooded by stream overflow almost yearly. Soils in other areas that are protected, such as Beaucoup and Titus soils along the Illinois River, are subject to only occasional flooding.

Poor tilth is a management concern on about 27 percent of the cropland in the county. Soil tilth is an important factor affecting the germination of seeds, the rate of water infiltration, and the overall workability of the soil. Soils that have good tilth are granular and porous and have a high content of organic matter. Poor tilth reduces the rate of water infiltration, increases the runoff rate, and increases the susceptibility to erosion in the more sloping areas. Soils with poor tilth generally have a surface layer that is sticky when wet and hard and cloddy when dry. These soils can be tilled within only a narrow range in moisture content; therefore, preparing a seedbed is difficult.

Poor tilth can be a result of erosion. In eroded areas, where part of the subsoil has been incorporated into the plow layer, the content of organic matter in the surface soil is reduced and the content of clay is increased. Poor tilth also occurs in poorly drained soils that have a high content of clay, regardless of organic matter content, and in soils that have been excessively tilled. The tilth in areas of Rozetta soils, which have a high content of clay in the surface layer as a result of severe erosion, and in areas of the poorly drained Titus soils, which have a naturally high content of clay in the surface layer, is very susceptible to deterioration.

About 80 percent of the cropland in the county is affected by water erosion. Water erosion can occur when the surface soil is not protected against the impact of raindrops. The resulting reduction in soil aggregate stability reduces the rate of water infiltration and increases the rate of surface runoff. Soils in areas that have long or steep slopes also are susceptible to water erosion.

Erosion, primarily sheet and rill erosion, removes the surface soil. This part of the soil generally has the most biological activity and the greatest amount of organic matter. Soil productivity decreases as the content of organic matter and the level of natural fertility are lowered. Poor tilth and crusting occur as the subsoil, which generally has a higher content of clay than the surface soil, is incorporated through tillage into the plow layer. Sheet and rill erosion is a concern on soils that have slopes of more than 2 percent, such as Osco, Rozetta, and Fayette soils. Excessive runoff also reduces the quality of surface water through sedimentation and contamination by pesticides.

Wetness affects about 43 percent of the cropland in the county. Wetness is the result of poor drainage and occurs in soils that have a seasonal high water table at or near the surface. Ponding, which affects about 14 percent of the cropland in the county, occurs when the seasonal high water table is above the surface of the soil. Aeration is impeded in wet or ponded soils; the result is a reduction in the amount of oxygen that is available to plants. A deficiency in oxygen reduces root respiration and restricts the total volume of roots that develop. Prolonged deficiency in oxygen can result in root and plant death. Plants growing in soils that are seasonally wet also tend to develop a shallower root system than those in other areas and are more susceptible to moisture stress during periods of drought. Soil wetness and ponding can also delay tillage, planting, and harvesting.

A drainage system has already been established in the majority of the soils to allow for maximum crop production. Unless a drainage system is installed, some soils are so wet that crop production would generally not be feasible. The poorly drained Sable and Beaucoup soils are examples.

Excessive permeability is a concern in soils that have a high content of sand, such as Onarga and Sparta soils. Sandy soils have more and larger pores than other soils. The capacity of these sandy soils to retain moisture for plant use is limited. Deep leaching of nutrients and pesticides is also possible in these soils. This leaching increases the risk of ground-water pollution.

Low available water capacity is a concern in soils that have a high content of sand, a low content of clay, and a low content of organic matter. Crops require large quantities of water to supply their evapotranspiration needs. Unless rainfall is timely and abundant, most of this water must be stored within the soil. Chelsea soils have a low available water capacity. The resulting droughtiness limits the productivity of these soils.

Wind erosion occurs when long, unsheltered, smooth soil surfaces are exposed to wind velocities that are high enough to lift individual soil particles. Young plants are especially susceptible to the abrasive effects of the blowing soil particles. Severe wind erosion can remove the surface soil, exposing crop roots or covering crops with blowing debris. Soils that have a sandy surface layer, have a low content of organic matter, are dry, or have poor aggregate stability are the most susceptible to wind erosion. Chelsea and Sparta soils are examples.

The management concerns affecting the use of the detailed soil map units in the survey area for crops are shown in table 6. The paragraphs that follow list these management concerns and describe the related management measures.

The main management concerns are as follows:

Crusting.—Crusting can be minimized by increasing soil aggregate stability through the addition of organic material to the surface and through protecting the surface from the impact of raindrops by maintaining plant cover or crop residue on the surface.

Flooding.—Levees or diversions reduce the extent of crop damage caused by floodwater. Surface drainage ditches help to remove floodwater in areas where suitable outlets are available. The management of drainage in conformance with regulations influencing wetlands may require special permits and extra planning. Selecting crop varieties adapted to a shorter growing season and wetter conditions also reduces the extent of flood damage.

Poor tilth.—Tilth can be improved by returning crop residue to the soil, regularly adding other organic material, minimizing tillage, and timing conservation tillage operations to the most optimal soil moisture conditions.

Water erosion.—Water erosion can be controlled by applying a conservation tillage system that leaves crop residue on the surface after planting or by using a cropping system that includes grasses and legumes in the rotation. In areas that have long, uniform slopes, contour farming and/or terraces in combination with a conservation tillage system can help to control erosion.

Wetness.—Subsurface tile drains help to lower the seasonal high water table if suitable outlets are available. In areas of soils that have a high content of clay and restricted permeability, subsurface drainage may not be practical. In these areas, surface ditches may reduce the wetness. The management of drainage in conformance with regulations influencing wetlands may require special permits and extra planning.

Additional management concerns are as follows:

Excessive permeability.—Irrigation can supply the moisture needed for crops. Frequent applications of a small amount of fertilizer are needed. One application of a large amount can result in excessive loss of plant nutrients through leaching.

Low available water capacity.—Measures that conserve soil moisture include applying conservation tillage and cropping systems, establishing field windbreaks, and leaving crop residue on the surface.

Ponding.—Land grading helps to control ponding. Surface ditches and surface inlet tile also help to remove excess water. The management of drainage in conformance with regulations influencing wetlands may require special permits and extra planning.

Wind erosion.—Wind erosion can be controlled by applying a system of conservation tillage that leaves crop residue on the surface after planting, using a system that leaves the surface rough, establishing field windbreaks, and regularly adding other organic material to the soil.

The criteria used to determine the limitations or hazards are as follows:

Crusting.—The organic matter content in the surface layer is less than or equal to 2.5 percent, and the content of clay is more than 20 percent.

Excessive permeability.—The lower limit of the permeability rate is greater than or equal to 6.0 inches per hour within the soil profile.

Flooding.—The component of the map unit is occasionally or frequently flooded.

Low available water capacity.—The weighted average of the available water capacity between the surface and a depth of 40 inches is less than or equal to 0.1 inch per inch.

Ponding.—The upper limit of the ponding depth is greater than 0 inches.

Poor tilth.—The content of clay in the surface layer is greater than or equal to 27 percent.

Water erosion.—The K factor multiplied by the slope is greater than 0.8, and the slope is greater than or equal to 3 percent.

Wetness.—The seasonal high water table is within a depth of 1.5 feet.

Wind erosion.—The wind erodibility group (WEG) is 1 or 2.

Pasture Management Considerations

The main management concerns affecting the use of soils for pasture in the county are frost heave, low pH, and water erosion. Additional management concerns include equipment limitations, flooding, low available water capacity, low fertility, ponding, wetness, and wind erosion.

Frost heave occurs when ice lenses or bands that develop in the soil drive an ice wedge between two layers of soil near the surface layer. The ice wedges heave the overlying soil layer upward, snapping the roots of plants. Many of the plants die of dehydration and freezing. Soils that have a low content of sand have small pores that hold water and enable ice lenses to form. Rozetta, Fayette, and Hickory soils are examples of soils that are susceptible to frost heave.

Low pH is a concern in some soils in the county, such as Rozetta and Keomah soils. Soil reaction is a critical factor in the selection of forage plants and in the availability of nutrients and toxic elements for plant uptake. Soils that have a pH of less than 5.5 are characterized by reduced solubility and availability of nutrients for plant growth. Toxic elements may be released in soils that have very low pH values.

Water erosion occurs in overgrazed areas or during pasture establishment and renovation if the surface soil is not protected against the damaging impact of raindrops. The resulting poor tilth reduces the rate of water infiltration and increases the runoff rate. Soils in areas that have long or steep slopes are particularly susceptible to water erosion. Hickory and Fayette soils are examples.

Equipment limitations are a management concern in areas of soils that have slopes of more than 10 percent. Equipment limitations can cause rapid wear of equipment and can result in problems with fertilization, harvest, pasture renovation, and seedbed preparation.

Flooding is a concern along the major rivers and their tributaries. Wakeland soils in unprotected areas are flooded by stream overflow almost yearly. Soils in other areas that are protected, such as the Orion soils along the Illinois River, are subject to only occasional flooding.

Low available water capacity limits the productivity of soils that have a high content of sand, a low content of clay, and a low content of organic matter. Forage plants require large quantities of water to supply their evapotranspiration needs. Unless rainfall is timely and abundant, most of this water must be stored within the soil. Sarpy soils, for example, are subject to droughtiness, which is caused by the low available water capacity.

Low fertility occurs in soils that have a low content of organic matter and a low cation-exchange capacity. The capacity of the soil to retain nutrients for plant use is limited. In some areas, erosion has removed the surface soil, which generally has the most biological activity and the greatest amount of organic matter. The natural fertility of soils in these areas is lowered. Navlys soils are examples. In other areas the low content of organic matter and the low cation-exchange capacity are inherent in the soils. Chelsea soils are examples.

Ponding and wetness are the result of poor drainage. Soil wetness occurs when the seasonal high water table is at or near the surface. Keomah soils are examples of soils that have a seasonal high water table at or near the surface. The wetness limits the selection of species to those that are adapted to wet soils. Wet soils are also susceptible to compaction by machinery and livestock. Compaction impairs future use and soil productivity. Ponding occurs when the seasonal high water table is above the surface of the soil. Forage plants that are not adapted to submergence may be injured or killed by standing water. Rushville soils are examples of soils that are subject to ponding.

Wind erosion can occur during pasture establishment or renovation when long, unsheltered, smooth soil surfaces are exposed to wind velocities that are high enough to lift individual soil particles. Soils that have a sandy surface layer, have a low content of organic matter, are dry, or have poor aggregate stability are the most susceptible to wind erosion. Chelsea soils are examples.

The management concerns affecting the use of the detailed soil map units in the survey area for pasture are shown in table 7. The paragraphs that follow list the management concerns and describe the related management measures.

The main management concerns are as follows:

Frost heave.—Selecting adapted forage and hay varieties can minimize the effects of frost heave. Timely deferment of grazing maintains a protective cover on the surface. This protective cover helps to insulate the soil and thus helps to minimize the effects of frost heave.

Low pH.—Selecting adapted forage and hay varieties and applying lime can help to overcome this limitation. Applications of lime should be based on the results of soil tests.

Water erosion.—Deferred grazing helps to prevent overgrazing and surface compaction and thus reduces the runoff rate and the hazard of erosion. Tilling on the contour, using a no-till system of seeding when a seedbed is prepared or the pasture is renovated, and selecting adapted forage and hay varieties also help to control erosion.

Additional limitations and hazards are as follows:

Equipment limitations.—Equipment limitations cannot be easily overcome.

Flooding.—Surface drainage ditches help to remove floodwater in areas where suitable outlets are available. The management of drainage in conformance with regulations influencing wetlands may require special permits and extra planning. Selecting forage and hay varieties adapted to a shorter growing season and wetter conditions also helps to minimize the extent of flood damage. Restricted use during wet periods helps to keep the pasture in good condition.

Low available water capacity.—Reducing the evaporation and runoff rates and increasing the rate of water infiltration can conserve soil moisture. The selection of drought-tolerant grasses and legumes, timely deferment of grazing, and a no-till system of seeding for seedbed preparation help to maintain surface cover and conserve moisture. Field windbreaks also conserve soil moisture.

Low fertility.—Frequent applications of small amounts of fertilizer help to prevent excessive loss of plant nutrients through leaching. Including legumes in the seeding mixture can provide nitrogen for grass varieties. Timely deferment of grazing helps to maintain a protective cover on the surface, helps to maintain the content of organic matter, and provides a source of nutrients in the soil.

Ponding.—Land grading helps to control ponding. Surface ditches and surface inlet tile also help to remove excess water if suitable outlets are available. The management of drainage in conformance with regulations influencing wetlands may require special permits and extra planning. Selecting forage and hay varieties that are adapted to wet conditions improves forage production. Restricted use during wet periods helps to keep the pasture in good condition.

Wetness.—Subsurface tile drains help to lower the seasonal high water table if suitable outlets are available. The management of drainage in conformance with regulations influencing wetlands may require special permits and extra planning. Selecting forage and hay varieties that are adapted to wet conditions improves forage production. Restricted use during wet periods helps to keep the pasture in good condition.

Wind erosion.—Planting drought-tolerant grasses and legumes and using a no-till system of seeding during seedbed preparation help to maintain a protective cover on the surface and thus reduce the hazard of wind erosion. Field windbreaks also help to control wind erosion.

The criteria used to determine the limitations or hazards are as follows:

Equipment limitations.—The slope is more than 10 percent.

Flooding.—The component of the map unit is occasionally or frequently flooded.

Frost heave.—The potential for frost action is moderate or high.

Low available water capacity.—The weighted average of the available water capacity between the surface and a depth of 40 inches is less than or equal to 0.1 inch per inch.

Low fertility.—The average content of organic matter in the surface layer is less than 1 percent, or the cation-exchange capacity (CEC) is less than or equal to 7.

Low pH.—The pH between the surface and a depth of 40 inches is less than or equal to 5.5.

Ponding.—The upper limit of the ponding depth is greater than 0 inches.

Water erosion.—The K factor multiplied by the slope is greater than 0.8, and the slope is greater than or equal to 3 percent.

Wetness.—The seasonal high water table is within a depth of 1.5 feet.

Wind erosion.—The wind erodibility group (WEG) is 1 or 2.

Crop Yield Estimates

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 8. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of each map unit also is shown in the table.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby 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. Yields for dryland crops are based on a crop-fallow system.

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.

Pasture and Hayland Interpretations

Under good management, proper grazing is essential for the production of high-quality forage, stand survival, and erosion control. Proper grazing helps plants to maintain sufficient and generally vigorous top growth during the growing season. Brush control is essential in many areas, and weed control generally is needed. Rotation grazing and renovation also are important management practices.

Yield estimates are often provided in animal unit months (AUM), or the amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about forage yields other than those shown in table 8.

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 take into account 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 woodland, or for engineering purposes.

In the capability system, soils generally are grouped at three levels—capability class, subclass, and unit (USDA, 1961). These categories indicate the degree and kinds of limitations affecting mechanized farming systems that produce the more commonly grown field crops, such as corn, small grain, cotton, hay, and field-grown vegetables. Only class and subclass are used in this survey.

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.

If properly managed, soils in classes 1, 2, 3, and 4 are suitable for the mechanized production of commonly grown field crops and for pasture and woodland. The degree of the soil limitations affecting the production of cultivated crops increases progressively from class 1 to class 4. The limitations can affect levels of production and the risk of permanent soil deterioration caused by erosion and other factors.

Soils in classes 5, 6, and 7 are generally not suited to mechanized production of commonly grown field crops without special management, but they are suitable for plants that provide a permanent cover, such as grasses and trees. The severity of the soil limitations affecting crops increases progressively from class 5 to class 7. The local office of the Cooperative Extension Service or the Natural Resources Conservation Service can provide guidance on the use of these soils as cropland.

Areas in class 8 are generally not suitable for crops, pasture, or woodland without a level of management that is impractical. These areas may have potential for other uses, such as recreational facilities and wildlife habitat.

Capability subclasses identify the dominant kind of limitation in the 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 a 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.

There are no subclasses in class 1 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 mainly to pasture, woodland, wildlife habitat, or recreation.

The capability classification of each map unit is given in table 8.

Prime Farmland

Prime farmland is of major importance in meeting the Nation's short- and long-range needs for food and fiber. The acreage of high-quality farmland is limited, and the U.S. Department of Agriculture recognizes that government at local, State, and Federal levels, as well as individuals, must encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland soils, as defined by the U.S. Department of Agriculture, are soils that are best suited to food, feed, forage, fiber, and oilseed crops. Such soils have properties that favor the economic production of sustained high yields of crops. The soils need only to be treated and managed by acceptable farming methods. An adequate moisture supply and a sufficiently long growing season are required. Prime farmland soils produce the highest yields with minimal expenditure of energy and economic resources, and farming these soils results in the least damage to the environment.

Prime farmland soils may presently be used as cropland, pasture, or woodland or for other purposes. They either are used for food and fiber or are available for these uses. Urban or built-up land, public land, and water areas cannot be considered prime farmland. Urban or built-up land is any contiguous unit of land 10 acres or more in size that is used for such purposes as housing, industrial, and commercial sites, sites for institutions or public buildings, small parks, golf courses, cemeteries, railroad yards, airports, sanitary landfills, sewage treatment plants, and water-control structures. Public land is land not available for farming in National forests, National parks, military reservations, and State parks.

Prime farmland soils commonly receive an adequate and dependable supply of moisture from precipitation or irrigation (fig. 15). The temperature and growing season are favorable, and the level of acidity or alkalinity and the content of salts and sodium are acceptable. The soils have few, if any, rocks and are permeable to water and air. They are not excessively erodible or saturated with water for long periods, and they are not frequently flooded during the growing season or are protected from flooding. Slopes range mainly from 0 to 6 percent.

Soils that have a high water table, are subject to flooding, or are droughty may qualify as prime farmland where these limitations are overcome by drainage measures, flood control, or irrigation. Onsite evaluation is necessary to determine the effectiveness of corrective measures. More information about the

Figure 15.—An irrigation system in an area of Sparta loamy fine sand, 1 to 7 percent slopes.

criteria for prime farmland can be obtained at the local office of the Natural Resources Conservation Service.

A recent trend in land use has been the conversion of prime farmland to urban and industrial uses. The loss of prime farmland to other uses puts pressure on lands that are less productive than prime farmland.

The map units in the survey area that meet the requirements for prime farmland are listed in table 9. This list does not constitute a recommendation for a particular land use. On some soils included in the table, measures that overcome limitations are needed. The need for these measures is indicated in parentheses after the map unit name. The location of each map unit is shown on the detailed soil maps. The soil qualities that affect use and management are described in the section “Soil Series and Detailed Soil Map Units” in Part I of this publication.

Erosion Factors

Soil erodibility (K) and soil-loss tolerance (T) factors are used in an equation that predicts the amount of soil lost through water erosion in areas of cropland. The procedure for predicting soil loss is useful in guiding the selection of soil and water conservation practices. The erosion factors for the soils in the survey area are listed in table 19.

Soil Erodibility (Kw) Factor

The soil erodibility (Kw) factor indicates the susceptibility of a soil to sheet and rill erosion by water. The soil properties that influence erodibility are those that affect the infiltration rate, the movement of water through the soil, and the water storage capacity of the soil and those that allow the soil to resist dispersion, splashing, abrasion, and the transporting forces of rainfall and runoff. The most important soil properties are the content of silt plus very fine sand, the content of sand coarser than very fine sand, the content of organic matter, soil structure, and permeability.

Fragment-Free Soil Erodibility (Kf) Factor

This is one of the factors used in the revised Universal Soil Loss Equation. It shows the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Soil-Loss Tolerance (T) Factor

The soil-loss tolerance (T) factor is an estimate of the maximum annual rate of soil erosion that can occur over a sustained period without affecting crop productivity. The rate is expressed in tons of soil loss per acre per year. Ratings of 1 to 5 are used, depending on soil properties and prior erosion. The criteria used in assigning a T factor to a soil include maintenance of an adequate rooting depth for crop production, potential reduction of crop yields, maintenance of water-control structures affected by sedimentation, prevention of gullying, and the value of nutrients lost through erosion.

Wind Erodibility Groups

Wind erodibility is directly related to the percentage of dry, nonerodible surface soil aggregates larger than 0.84 millimeter in diameter. From this percentage, the wind erodibility index (I) factor is determined. This factor is an expression of the stability of the soil aggregates, or the extent to which they are broken down by tillage and the abrasion caused by windblown soil particles. Soils are assigned to wind erodibility groups (WEG) having similar percentages of dry soil aggregates larger than 0.84 millimeter. The wind erodibility groups and wind erodibility index numbers for the soils in the survey area are listed in table 19.

Additional information about wind erodibility groups and Kw, Kf, T, and I factors can be obtained from local offices of the Natural Resources Conservation Service or the Cooperative Extension Service.

Windbreaks and Environmental Plantings

Windbreaks protect livestock, buildings, and yards from wind and snow. They also protect fruit trees and gardens, and they furnish habitat for wildlife. Several rows of low- and high-growing broadleaf and coniferous trees and shrubs provide the most protection.

Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil. Field windbreaks protect cropland and crops from wind, help to keep snow on the fields, and provide food and cover for wildlife.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To ensure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Windbreaks are often planted on land that did not originally support trees. Knowledge of how trees perform on such land can be gained only by observing and recording the performance of trees that have been planted and have survived. Many popular windbreak species are not indigenous to the areas in which they are planted.

Each tree or shrub species has certain climatic and physiographic limits. Within these parameters, a tree or shrub may grow well or grow poorly, depending on the characteristics of the soil. Each tree or shrub has definable potential heights in a given physiographic area and under a given climate. Accurate definitions of potential heights are necessary when a windbreak is planned and designed.

Table 10 shows the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates in this table are based on measurements and observation of established plantings that have been given adequate care. They can be used as a guide in planning windbreaks and screens. Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from local offices of the Natural Resources Conservation Service or the Cooperative Extension Service or from a nursery.

Forestland

Barrie McVey, district forester, Forest Service, helped prepare this section.

In the early 1800's, about 61 percent of the State of Illinois was prairie and 38 percent was forest. The survey area was 63 percent forest and 36 percent prairie at this time. As the county was settled, the acreage of forestland declined because of the demand for housing materials and fuel and the clearing of forestland for agricultural purposes. A slight increase in forestland acreage since the early 1900's reflects the decreasing demand for pasture and hayland. This increase in forestland acreage, however, is through secondary growth, and the quality and value of the timber have diminished according to today's standard for timber value (Iverson and others, 1989).

In 1985, about 108,800 acres, or less than 20 percent of the county, still supported forestland (Iverson and others, 1989). Much of the remaining forestland is in areas that are too steep, too wet, or too remote and isolated for row crops. Most of this forestland is in associations 4, 5, 6, 8, and 9, which are described under the heading "General Soil Map Units" in Part I of this publication. The soils in these areas vary widely in their potential for producing trees of high quality.

The most common tree species in upland forests in the county include white oak, northern red oak, black oak, shagbark hickory, bitternut hickory, sugar maple, black cherry, white ash, green ash, black walnut, and American elm. Sycamore, box elder, willowbirch, and cottonwood grow on the flood plains along major drainageways. Forestland that is improperly managed may be invaded with Osage-orange (hedge) and honeylocust.

A small amount of the increase in the acreage of forestland in Fulton County is partly a result of the revegetation of surface-mined areas. Fulton County has the largest acreage of surface-mined areas in the State of Illinois. Until about 1946, reforestation was the primary method of reclamation. In 1930, coal companies agreed to plant trees on acreage equal to surface-mined areas annually. Tree planting was initially attractive to operators because trees were readily available from the Illinois Department of Conservation as a result of the discontinuation of programs of the Civilian Conservation Corps. By 1946, the trend had shifted from planting trees to pasture seeding as owners became discouraged with the relatively slow growth of trees and the resulting slow economic return. Tree planting continues in some areas, however. In 1969, a total of 8,518 acres of surface-mined land had been reforested (Haynes and Klimstra, 1975).

Research conducted on surface-mined land shows that white pine, tulip poplar, red oak, and black walnut grow better in these areas than other species. Volunteer species, such as sycamore, sweetgum, elm, willow, box elder, black cherry, cottonwood, and river birch, thrive on the surface-mined land. Central States Forest Experiment Station research results have shown that trees grow better on ungraded banks than on graded banks. Surface-mined land that is composed of fine particles becomes compacted during the grading process. As a result, fewer trees survive and the yearly growth rate is reduced. This research shows that half as many trees can be planted on graded rocky material as in ungraded areas.

The majority of the forestland in Fulton County is privately owned. Some reforested surface-mined forestland is owned by corporations. Each year, some land is cleared, generally in parcels ranging from a quarter of an acre to several acres. Many of the more sloping areas are subject to severe erosion after they are cleared. The timber canopy and the accumulation of leaf litter on the surface provide very effective protection from the impact of raindrops and the force of flowing water on the surface. Once this cover is removed, however, extensive erosion is possible, especially in areas of strongly sloping soils cleared for use as marginal farmland. As a result, these areas are better suited to timber than to row crops.

Harvesting on private land is generally on steep or very steep soils, such as Elco, Hickory, and Marseilles soils, or on the wet soils on flood plains, such as Lawson and Sawmill soils that have not been disturbed for a number of years. Selectively cutting white oak, hickory, ash, and walnut for sawlogs is the most common harvesting method. Some softwood trees are harvested for pulpwood.

Many of the existing stands can be improved by thinning out mature trees and trees of low value, which helps to control plant competition, and then interplanting desirable species. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Logging trails and access roads are commonly used in steep areas. Shaping and seeding these trails and roads and applying fertilizer immediately after harvest help to control erosion. Properly shaped and constructed water bars across the trails also help to control erosion. Forestland can be greatly improved by measures that exclude livestock or that restrict grazing to the fall. These measures help to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to the tree roots. Measures that protect the forestland from fire, damaging insects, and disease are needed. The Natural Resources Conservation Service, the local district forester, or the Cooperative Extension Service can help to determine specific forestland management needs.

Forestland Management and Productivity

Table 11 can be used by forest managers in planning the use of soils for wood crops. Only the soils that are suitable for production of wood crops are listed. The table lists the ***ordination symbol*** for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the ordination symbol, a number, indicates the potential productivity of the soils for an indicator tree species. The number indicates the volume, in cubic meters per hectare per year, which the indicator species can produce in a pure stand under natural conditions. The larger the number, the greater the potential productivity. Potential productivity is based on site index and the corresponding culmination of the mean annual increment. For example, the number 1 indicates a potential production of 1 cubic meter of wood per hectare per year (14.3 cubic feet per acre per year); the number 10 indicates a potential production of 10 cubic meters of wood per hectare per year (143 cubic feet per acre per year).

The second part of the ordination symbol, a letter, indicates the major kind of soil limitation. The letter ***X*** indicates that forestland use and management are limited by stones or rocks. ***W*** indicates that forestland use and management are significantly limited by excess water, either seasonally or throughout the year. Restricted drainage, a high water table, or flooding can adversely affect either stand development or management. ***T*** indicates that the root zone has toxic substances. Excessive alkalinity, acidity, sodium salts, or other toxic substances impede the development of desirable species. ***D*** indicates that forestland use and management are limited by a restricted rooting depth. The rooting depth is restricted by hard bedrock, a hardpan, or other restrictive layers in the soil. ***C*** indicates that forestland use and management are limited by the kind or amount of clay in the upper part of the soil. ***S*** indicates that the soil is sandy, has a low available water capacity, and normally has a low content of available plant nutrients. The use of equipment is limited during dry periods. ***F*** indicates that forestland use and management are limited by a high content of rock fragments that are larger than 2 millimeters and smaller than 10 inches. This subclass includes flaggy soils. ***R*** indicates that forestland use and management are limited by excessive slope. The letter ***A*** indicates that no significant limitations affect forestland use and management.

In the table, ***slight, moderate,*** and ***severe*** indicate the degree of the major soil limitations to be considered in management.

Erosion hazard is the probability that damage will occur as a result of site preparation and cutting where the soil is exposed along roads, skid trails, and fire lanes and in log-handling areas. Forests that have been burned or overgrazed also are subject to erosion. Ratings of the erosion hazard are based on the percent of the slope. A rating of ***slight*** indicates that the expected soil loss is small; ***moderate*** indicates that some measures are needed to control erosion during logging and road construction; and ***severe*** indicates that intensive management or special equipment and methods are needed to prevent excessive soil loss.

Equipment limitation reflects the characteristics and conditions of the soil that restrict use of the equipment generally needed in forestland management or harvesting. The chief characteristics and conditions considered in the ratings are slope, stones on the surface, rock outcrops, soil wetness, and texture of the surface layer. A rating of ***slight*** indicates that the use of equipment is not limited to a particular kind of equipment or time of year; ***moderate*** indicates that there is a short seasonal limitation or a need for some modification in the management of equipment; and ***severe*** indicates that there is a seasonal limitation, a need for special equipment or management, or a hazard in the use of equipment.

Seedling mortality refers to the death of naturally occurring or planted tree seedlings, as influenced by the kinds of soil, soil wetness, or topographic conditions. The factors used in rating the soils for seedling mortality are texture of the surface layer, depth to a seasonal high water table and the length of the period when the water table is high, rock fragments in the surface layer, effective rooting depth, and slope aspect. The ratings are for seedlings that are from a good planting stock and that are properly planted during a period of average rainfall. A rating of ***slight*** indicates that the expected mortality of the planted seedlings is less than 25 percent; ***moderate***, 25 to 50 percent; and ***severe***, more than 50 percent.

Windthrow hazard is the likelihood that trees will be uprooted by the wind because the soil is not deep enough for adequate root anchorage. The main restrictions that affect rooting are a seasonal high water table and the depth to bedrock, a fragipan, or other limiting layers. A rating of ***slight*** indicates that trees in wooded areas are not expected to be blown down by commonly occurring winds; ***moderate*** indicates that some trees are blown down during periods of excessive soil wetness and strong winds; and ***severe*** indicates that many trees are blown down during periods of excessive soil wetness and moderate or strong winds.

Plant competition ratings indicate the degree to which undesirable species are expected to invade and grow when openings are made in the tree canopy. The main factors that affect plant competition are depth to the water table and the available water capacity. A rating of ***slight*** indicates that there is little or no competition from other plants; ***moderate*** indicates that plant competition is expected to hinder the development of a fully stocked stand of desirable trees; and ***severe*** indicates that plant competition is expected to prevent the establishment of a desirable stand unless the site is intensively prepared, weeded, or otherwise managed for the control of undesirable plants.

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. The site indexes shown in table 11 are averages based on measurements made at sites that are representative of the soil series. When the site index and forestland productivity of different soils are compared, the values for the same tree species should be compared. The higher the site index number, the more productive the soil for that species. Site index values are used in conjunction with yield tables to determine average annual yields. Indirectly, they are used to determine the productivity class in the ordination symbol.

The ***volume***, a number, is the yield likely to be produced by the most important trees. This number, expressed as cubic feet per acre per year, indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

The first species listed under ***common trees*** for a soil is the indicator species for that soil. It generally is one of the most productive on the soil and is the species that determines the productivity class in the ordination symbol.

Suggested trees to plant are those that are suitable for commercial wood production.

Recreation

Fulton County has a wide variety of recreational areas, including wetlands along the Illinois and Spoon Rivers. Private recreational facilities include a shooting preserve, numerous ponds for fishing, several hunting clubs along the Illinois River, and several golf courses. Areas that are available to the public include hiking trails, campgrounds, natural scenic areas, and many historic sites, such as Dickson Mounds State Park. The survey area also has many State, county, and city parks.

The Illinois River offers opportunities for a wide variety of recreational activities. These activities include boating, water-skiing, fishing, and waterfowl hunting.

The potential for additional development of recreational facilities in Fulton County is excellent. The many surface-mined areas in the county have the best potential for conversion to recreational uses.

The soils of the survey area are rated in table 12 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, the ability of the soil to support vegetation, access to water, potential water impoundment sites, and either access to public sewer lines or the capacity of the soil to absorb septic tank effluent. Soils subject to flooding are limited, in varying degrees, for recreational uses by the duration of flooding and the season when it occurs. Onsite assessment of the height, duration, intensity, and frequency of flooding is essential in planning recreational facilities.

Camp areas are tracts of land used intensively as sites for tents, trailers, and campers and for outdoor activities that accompany such sites. These 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 soils are rated on the basis of soil properties that influence the ease of developing camp areas and performance of the areas after development. Also considered are the soil properties that influence trafficability and promote the growth of vegetation after heavy use.

Picnic areas are natural or landscaped tracts of land that are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The soils are rated on the basis of soil properties that influence the cost of shaping the site, trafficability, and the growth of vegetation after development. The surface of picnic areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry.

Playgrounds are areas used intensively for baseball, football, or similar activities. These areas require a nearly level soil that is free of stones and that can withstand heavy foot traffic and maintain an adequate cover of vegetation. The soils are rated on the basis of soil properties that influence the cost of shaping the site, trafficability, and the growth of vegetation. Slope and stoniness are the main concerns in developing playgrounds. The surface of the playgrounds should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry.

Paths and trails are areas used for hiking and horseback riding. The areas should require little or no cutting and filling during site preparation. The soils are rated on the basis of soil properties that influence trafficability and erodibility. Paths and trails should remain firm under foot traffic and not be dusty when dry.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

The interpretive ratings in this table help engineers, planners, and others to understand how soil properties influence recreational uses. Ratings for proposed uses are given in terms of limitations. Only the most restrictive features are listed. Other features may limit a specific recreational use.

The degree of soil limitation is expressed as slight, moderate, or severe.

Slight means that soil properties are favorable for the rated use. The limitations are minor and can be easily overcome. Good performance and low maintenance are expected.

Moderate means that soil properties are moderately favorable for the rated use. The limitations can be overcome or modified by special planning, design, or maintenance. During some part of the year, the expected performance may be less desirable than that of soils rated ***slight***.

Severe means that soil properties are unfavorable for the rated use. Examples of limitations are slope, bedrock near the surface, flooding, and a seasonal high water table. These limitations generally require major soil reclamation, special design, or intensive maintenance. Overcoming the limitations generally is difficult and costly.

The information in table 12 can be supplemented by other information in this survey, for example, interpretations for dwellings without basements and for local roads and streets in table 14 and interpretations for septic tank absorption fields in table 15.

Wildlife Habitat

John Ball, assistant site supervisor at Rice Lake Wildlife Area, helped prepare this section.

Fulton County's diverse habitat types account for the corresponding diversity and number of wildlife species in the county. The Illinois River and Spoon River basins provide diverse areas, including seasonal backwaters, leveed expanses of row crops, and flood plain timber stands interspersed with smaller fields and pastures. The main crops produced are corn and soybeans. Wheat and alfalfa are also grown. These crops, along with the resulting crop residue and waste grain, provide food resources for resident and migrating wildlife species. Drainage ditches, brushy edge, forest stands, and grassed waterways provide food, nesting cover, and escape cover for various species ranging from field mice to deer. Wintering bald eagles utilize large trees for loafing, feeding, and nocturnal roosting.

More than 50,000 acres in the county consists of areas that were surface mined for coal under various reclamation laws. These surface-mined areas further increase the diversity of plant and animal life. The townships of Canton, Farmington, Buckheart, Putnam, Joshua, Banner, and Vermont exhibit the highest concentration of surface-mined acreage. Smaller mined tracts are scattered throughout the county. The water, grassland cover, hay fields, and brushy cover on much of the mined land provide habitat for resident giant Canada geese, ducks, deer, coyote, and a variety of openland species.

Adding to the existing undisturbed wetlands in the county, surface-mining activities created new wetlands. While many abandoned pits have filled with ground water and runoff and have become deep-water lakes, much of the mining activity produced areas that developed into extensive wetland habitats. These areas are dominated by black willow, coontail moss, nutsedges, smartweed, and other species that prefer moist soil conditions or thrive in submerged areas. Muskrats, beaver, shorebirds, marsh wrens, mink, various waterfowl species, reptiles, and amphibians utilize these areas.

The southwestern part of the county is dominated by relatively larger stands of mixed hardwood timber interspersed with open fields. These areas provide high-quality habitat for wild turkey, deer, pileated woodpeckers, and raccoon.

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. If food, cover, or water is missing, inadequate, or inaccessible, wildlife will be scarce or will not inhabit the area.

If the soils have potential for habitat development, wildlife habitat can be created or improved by planting appropriate vegetation, properly managing the existing plant cover, and fostering the natural establishment of desirable plants.

In table 13, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of ***good*** indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of ***fair*** indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of ***poor*** indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of ***very poor*** indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

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

Grain and seed crops are domestic grains and seed-producing herbaceous plants used by wildlife. Examples are wheat, rye, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes planted for wildlife food and cover. Examples are fescue, bromegrass, timothy, orchardgrass, clover, alfalfa, trefoil, reed canarygrass, and crownvetch.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds, that provide food and cover for wildlife. Examples are bluestem, indiangrass, blueberry, goldenrod, lambsquarters, dandelions, blackberry, ragweed, wheatgrass, fescue, and nightshade.

The major soil properties affecting the growth of grain and forage crops and wild herbaceous plants are depth of the root zone, texture of the surface layer, the amount of water available to plants, wetness, salinity or sodicity, and flooding. The length of the growing season also is important.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage that wildlife eat. Examples are oak, poplar, boxelder, birch, maple, green ash, willow, and American elm. Examples of fruit-producing shrubs that are suitable for planting on soils that have good potential for these plants are hawthorn, honeysuckle, American plum, redosier dogwood, chokecherry, serviceberry, and crabapple.

Coniferous plants are cone-bearing trees, shrubs, or ground cover species that provide habitat or supply food in the form of browse, seed, or fruitlike cones. Examples are pine, spruce, hemlock, fir, yew, cedar, larch, and juniper.

The major soil properties affecting the growth of hardwood and coniferous trees and shrubs are depth of the root zone, the amount of water available to plants, and wetness.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Wetland plants produce food or cover for wetland wildlife. Examples of these plants are smartweed, wild millet, rushes, sedges, bulrushes, wild rice, arrowhead, waterplantain, pickerelweed, and cattail.

The major soil properties affecting wetland plants are texture of the surface layer, wetness, acidity or alkalinity, and slope.

Shallow water areas have an average depth of less than 5 feet. They are useful as habitat for some wildlife species. They are naturally wet areas or are created by dams, levees, or water-control measures in marshes or streams. Examples are muskrat marshes, waterfowl feeding areas, wildlife watering developments, beaver ponds, and other wildlife ponds.

The major soil properties affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, and shrubs. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The wildlife attracted to these areas include quail, Hungarian partridge, pheasant, sharp-tailed grouse, sage grouse, meadowlark, field sparrow, killdeer, cottontail rabbit, and red fox.

Habitat for woodland wildlife consists of areas of hardwoods or conifers or a mixture of these and associated grasses, legumes, and wild herbaceous plants. The wildlife attracted to this habitat include wild turkey, ruffed grouse, thrushes, woodpeckers, owls, tree squirrels, porcupine, raccoon, deer, elk, and black bear.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas that support water-tolerant plants. The wildlife attracted to this habitat include ducks, geese, herons, bitterns, rails, kingfishers, muskrat, otter, mink, and beaver.

Hydric Soils

In this section, hydric soils are defined and described and the hydric soils in the survey area are listed.

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin and others, 1979; U.S. Army Corps of Engineers, 1987; National Research Council, 1995; Tiner, 1985). Criteria for each of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). These soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 1995). These criteria are used to identify a phase of a soil series that normally is associated with wetlands. The criteria used are selected estimated soil properties that are described in “Soil Taxonomy” (Soil Survey Staff, 1999) and “Keys to Soil Taxonomy” (Soil Survey Staff, 1998) and in the “Soil Survey Manual” (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils in this survey area are specified in “Field Indicators of Hydric Soils in the United States” (Hurt and others, 1998).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

The following map units meet the definition of hydric soils and, in addition, have at least one of the hydric soil indicators. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site (National Research Council, 1995; Hurt and others, 1998).

16A Rushville silt loam, 0 to 2 percent slopes
45A Denny silt loam, 0 to 2 percent slopes
68A Sable silty clay loam, 0 to 2 percent slopes
632A Copperas silty clay loam, 0 to 2 percent slopes
3070A Beaucoup silty clay loam, 0 to 2 percent slopes, frequently flooded
3107A Sawmill silty clay loam, 0 to 2 percent slopes, frequently flooded
3404A Titus silty clay loam, 0 to 2 percent slopes, frequently flooded
3641L Quiver silty clay loam, 0 to 2 percent slopes, frequently flooded, long duration
8070A Beaucoup silty clay loam, 0 to 2 percent slopes, occasionally flooded
8302A Ambraw clay loam, 0 to 2 percent slopes, occasionally flooded
8404A Titus silty clay, 0 to 2 percent slopes, occasionally flooded
8608A Mudhen clay loam, 0 to 2 percent slopes, occasionally flooded
8611A Sepo silty clay loam, 0 to 2 percent slopes, occasionally flooded
9068A Sable silty clay loam, terrace, 0 to 2 percent slopes

Map units that are made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

Engineering

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

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil 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; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

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

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

Building Site Development

Table 14 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered ***slight*** if soil properties and site features generally are favorable for the indicated use and limitations are minor and easily overcome; ***moderate*** if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and ***severe*** if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

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

Dwellings and ***small commercial buildings*** are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrinking and swelling, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 6 feet are not considered.

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

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

Sanitary Facilities

Table 15 shows the degree and the kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. It also shows the suitability of the soils for use as a daily cover for landfill.

Soil properties are important in selecting sites for sanitary facilities and in identifying limiting soil properties and site features to be considered in planning, design, and installation. Soil limitation ratings of ***slight, moderate,*** or ***severe*** are given for septic tank absorption fields, sewage lagoons, and trench and area sanitary landfills. Soil suitability ratings of ***good, fair,*** and ***poor*** are given for daily cover for landfill.

A rating of ***slight*** or ***good*** indicates that the soils have no limitations or that the limitations can be easily overcome. Good performance and low maintenance can be expected. A rating of ***moderate*** or ***fair*** indicates that the limitations should be recognized but generally can be overcome by good management or special design. A rating of ***severe*** or ***poor*** indicates that overcoming the limitations is difficult or impractical. Increased maintenance may be required.

Septic tank absorption fields are areas in which subsurface systems of tile or perforated pipe distribute effluent from a septic tank into the natural soil. The centerline of the tile is assumed to be at a depth of 24 inches. Only the part of the soil between depths of 24 and 60 inches is considered in making the ratings. The soil properties and site features considered are those that affect the absorption of the effluent, those that affect the construction and maintenance of the system, and those that may affect public health.

The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere with installation.

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

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

Table 15 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage resulting from rapid permeability in the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground-water pollution. Ease of excavation and revegetation should be considered.

The ratings in the table are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste. The suitability of a soil for use as cover is based on properties that affect workability and the ease of digging, moving, and spreading the material over the refuse daily during both wet and dry periods.

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

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. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Waste Management

Soil properties are important when organic waste is applied as fertilizer and wastewater is applied in irrigated areas. They also are important when the soil is used as a medium for the treatment and disposal of the organic waste and wastewater. Unfavorable soil properties can result in environmental damage.

The use of organic waste and wastewater as production resources results in energy and resource conservation and minimizes the problems associated with waste disposal. If disposal is the goal, applying a maximum amount of the organic waste or the wastewater to a minimal area holds costs to a minimum and environmental damage is the main hazard. If reuse is the goal, a minimum amount should be applied to a maximum area and environmental damage is unlikely.

Interpretations developed for waste management may include ratings for manure- and food-processing waste, municipal sewage sludge, use of wastewater for irrigation, and treatment of wastewater by slow rate, overland flow, and rapid infiltration processes.

Specific information regarding waste management is available at the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Construction Materials

Table 16 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated ***good, fair,*** or ***poor*** as a source of roadfill and topsoil. They are rated as a ***probable*** or ***improbable*** source of sand and gravel.

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

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

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated ***good*** contain significant amounts of sand or gravel, or both. They have at least 5 feet of suitable material, a low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated ***fair*** are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have a moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated ***poor*** have one or more of the following characteristics: a plasticity index of more than 10, a high shrink-swell potential, many stones, slopes of more than 25 percent, or a water table at a depth of less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and ***gravel*** are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In the table, only the probability of finding material in suitable quantity in or below the soil is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions in Part I of this publication. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

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

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

Soils rated ***good*** have friable, loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated ***fair*** are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated ***poor*** are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal high water table at or near the surface.

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

Water Management

Table 17 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The limitations are considered ***slight*** if soil properties and site features generally are favorable for the indicated use and limitations are minor and are easily overcome; ***moderate*** if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and ***severe*** if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

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

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In table 17, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even more than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

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

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and the potential for frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, or sulfur. Availability of drainage outlets is not considered in the ratings.

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

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff.

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

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

Soil Properties

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

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

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

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

Engineering Index Properties

Table 18 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 in the series descriptions in Part I of this survey.

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. 16). “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

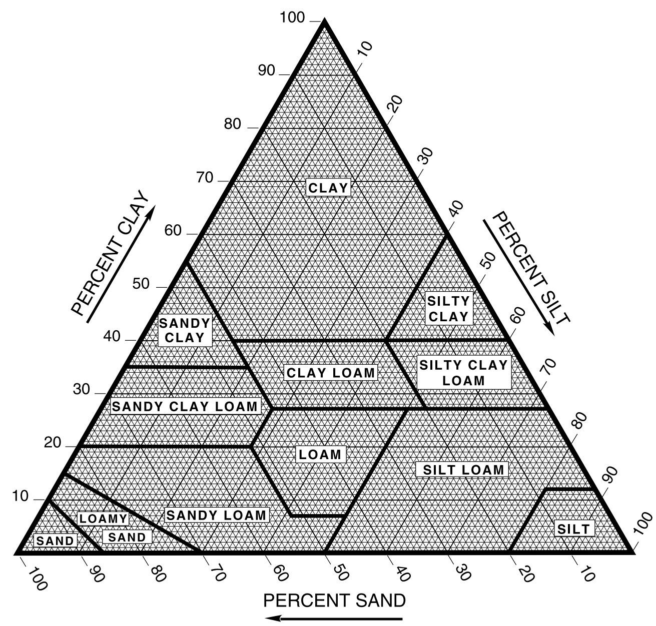


Figure 16.—Percentages of clay, silt, and sand in the basic USDA soil textural classes.

particles coarser than sand is as much as 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 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

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

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

The estimates of grain-size distribution, liquid limit, and plasticity index are 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 19 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

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 in the series descriptions in Part I of this survey.

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

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

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at $^1/_3$-bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In table 19, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability (K_{sat}) refers to the ability of a soil to transmit water or air. The term “permeability,” as used in soil surveys, indicates saturated hydraulic conductivity (K_{sat}). The estimates in the table indicate the rate of water movement, in inches per hour, when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

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

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at $^{1}/_{3}$- or $^{1}/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. Volume change is influenced by the amount and type of clay minerals in the soil.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 19, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

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

Erosion factors are shown in table 19 as the K factor (Kw and Kf) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of several factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and permeability. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

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

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are as follows:

1. Coarse sands, sands, fine sands, and very fine sands.

2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, ash material, and sapric soil material.

3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams.

4L. Calcareous loams, silt loams, clay loams, and silty clay loams.

4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay.

5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material.

6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay.

7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material.

8. Soils that are not subject to wind erosion because of 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 reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Cation-exchange capacity is 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. 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. Soils having a high cation-exchange capacity can retain cations. The ability to retain cations helps to prevent the pollution of ground water.

Calcium carbonate equivalent is the percent of carbonates, by weight, in the soil. 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.

Water Features

Table 20 gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, 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.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

The ***months*** in the table indicate the portion of the year in which the feature is most likely to be a concern.

Water table refers to a saturated zone in the soil. Table 20 indicates, by month, depth to the top (***upper limit***) and base (***lower limit***) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. Table 20 indicates ***surface water depth*** and the ***duration*** and ***frequency*** of ponding. Surface water depth refers to the depth of the water above the surface of the soil. 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 is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and ***frequency*** are estimated. Duration is expressed as ***extremely brief*** if 0.1 hour to 4 hours, ***very brief*** if 4 hours to 2 days, ***brief*** if 2 to 7 days, ***long*** if 7 to 30 days, and ***very long*** if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. ***None*** means that flooding is not probable; ***very rare*** that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); ***rare*** that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); ***occasional*** that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); ***frequent*** that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and ***very frequent*** that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

Soil Features

Table 21 gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A ***restrictive layer*** is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. ***Depth to top*** is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

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

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

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

References

American Association of State Highway and Transportation Officials (AASHTO). 2000. Standard specifications for transportation materials and methods of sampling and testing. 20th edition, 2 volumes.

American Society for Testing and Materials (ASTM). 2001. Standard classification of soils for engineering purposes. ASTM Standard D 2487–00.

Clark, Helen Hollandsworth. 1969. A history of Fulton County, Illinois, in Spoon River country, 1818–1968.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS–79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. February 24, 1995. Hydric soils of the United States.

Fulton County Historical and Geological Society. 1879. History of Fulton County, Illinois.

Haynes, Ronnie J., and W.D. Klimstra. 1975. Illinois lands surface mined for coal.

Hudson, Berman D. 1992. The soil survey as paradigm-based science. Soil Science Society of America Journal, volume 56, number 3, pages 836–41.

Hurt, G.W., P.M. Whited, and R.F. Pringle, editors. Version 4.0, 1998. Field indicators of hydric soils in the United States.

Iverson, Louis R., Richard L. Oliver, Dennis P. Tucker, Paul G. Risser, Christopher D. Burnett, and Ronald G. Rayburn. 1989. Forest resources of Illinois: An atlas and analysis of spatial and temporal trends. Illinois Natural History Survey Special Publication II.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Reinersten, David L. 1988. A guide to the geology of the Canton area, Fulton County. Illinois State Geological Survey, Department of Energy and Natural Resources, Field Trip Guidebook 1988B.

Reinersten, David L., Russell J. Jacobson, Myrna M. Killey, Robert S. Nelson, and Phillip C. Reed. 1993. Guide to the geology of the Lewistown-Spoon River area. Illinois State Geological Survey, Department of Energy and Natural Resources, Field Trip Guidebook 1993B.

Smith, R.S., E.E. DeTurk, F.C. Bauer, and L.H. Smith. 1932. Fulton County soils. University of Illinois, Agricultural Experiment Station Soil Report 51.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.

Soil Survey Staff. 1998. Keys to soil taxonomy. 8th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y–87–1.

United States Department of Agriculture. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210.

Glossary

Ablation till. Loose, permeable till deposited during the final downwasting of glacial ice. Lenses of crudely sorted sand and gravel are common.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvial fan. The fanlike deposit of a stream where it issues from a gorge upon a plain or of a tributary stream near or at its junction with its main stream.

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.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Aspect. The direction in which a slope faces.

Association, soil. A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Backslope. The position that forms the steepest and generally linear, middle portion of a hillslope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.

Basal area. The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.

Basal till. Compact glacial till deposited beneath the ice.

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.

Bedrock-controlled topography. A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.

Bench terrace. A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Blowout. A shallow depression from which all or most of the soil material has been removed by the wind. A blowout has a flat or irregular floor formed by a resistant layer or by an accumulation of pebbles or cobbles. In some blowouts the water table is exposed.

Board foot. A unit of measurement of the wood in lumber, logs, or trees. The amount of wood in a board 1 foot wide, 1 foot long, and 1 inch thick before finishing.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Breast height. An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Canopy. The leafy crown of trees or shrubs.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or “chain,” of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Catsteps. Very small, irregular terraces on steep hillsides, especially in pasture, formed by the trampling of cattle or the slippage of saturated soil.

Channery soil material. Soil material that has, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Chemical treatment. Control of unwanted vegetation through the use of chemicals.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay 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.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Clearcut. A method of forest harvesting that removes the entire stand of trees in one cutting. Reproduction is achieved artificially or by natural seeding from adjacent stands.

Climax plant community. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Closed depression. A low area completely surrounded by higher ground and having no natural outlet.

Coarse textured soil. Sand or loamy sand.

COLE (coefficient of linear extensibility). See Linear extensibility.

Colluvium. Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are 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."

Consolidated sandstone. Sandstone that disperses within a few hours when fragments are placed in water. The fragments are extremely hard or very hard when dry, are not easily crushed, and cannot be textured by the usual field method.

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.

Culmination of the mean annual increment (CMAI). The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of 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.

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.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Erosion pavement. A layer of gravel or stones that remains on the surface after fine particles are removed by sheet or rill erosion.

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.

Extrusive rock. Igneous rock derived from deep-seated molten matter (magma) emplaced on the earth's surface.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fast intake (in tables). The rapid movement of water into the soil.

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

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called ***normal field capacity, normal moisture capacity,*** or ***capillary capacity***.

Fine textured soil. Sandy clay, silty clay, or clay.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

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.

Footslope. The position that forms the inner, gently inclined surface at the base of a hillslope. In profile, footslopes are commonly concave. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

Forb. Any herbaceous plant not a grass or a sedge.

Forest cover. All trees and other woody plants (underbrush) covering the ground in a forest.

Forest type. A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots.

When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gilgai. Commonly, a succession of microbasins and microknolls in nearly level areas or of microvalleys and microridges parallel with the slope. Typically, the microrelief of clayey soils that shrink and swell considerably with changes in moisture content.

Glacial drift. Pulverized and other rock material transported by glacial ice and then deposited. Also, the sorted and unsorted material deposited by streams flowing from glaciers.

Glacial outwash. Gravel, sand, and silt, commonly stratified, deposited by glacial meltwater.

Glacial till. Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Glaciated uplands. Land areas that were previously covered by continental or alpine glaciers and that are at a higher elevation than the flood plains.

Glaciofluvial deposits. Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.

Glaciolacustrine deposits. Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are interbedded or laminated.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Graded stripcropping. Growing crops in strips that grade toward a protected waterway.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water. Water filling all the unblocked pores of the material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Gypsum. A mineral consisting of hydrous calcium sulfate.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Head out. To form a flower head.

Head slope. A geomorphic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainageway. The overland waterflow is converging.

Heavy metal. Inorganic substances that are solid at ordinary temperatures and are not soluble in water. They form oxides and hydroxides that are basic. Examples are copper, iron, cadmium, zinc, manganese, lead, and arsenic.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.

High-residue crops. Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Hill. A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Igneous rock. Rock formed by solidification from a molten or partially molten state. Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Interfluve. An elevated area between two drainageways that sheds water to those drainageways.

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:

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Karst (topography). The relief of an area underlain by limestone that dissolves in differing degrees, thus forming numerous depressions or small basins.

Knoll. A small, low, rounded hill rising above adjacent landforms.

K_{sat}. Saturated hydraulic conductivity. (See Permeability.)

Lacustrine deposit. Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Landslide. The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

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.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

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.

Merchantable trees. Trees that are of sufficient size to be economically processed into wood products.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Microhigh. An area that is 2 to 12 inches higher than the adjacent microlow.

Microlow. An areas that is 2 to 12 inches lower than the adjacent microhigh.

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 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).

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Mudstone. Sedimentary rock formed by induration of silt and clay in approximately equal amounts.

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.

Nose slope. A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent.

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

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

Oxbow. The horseshoe-shaped channel of a former meander, remaining after the stream formed a cutoff across a narrow meander neck.

Paleoterrace. An erosional remnant of a terrace that retains the surface form and alluvial deposits of its origin but was not emplaced by, and commonly does not grade to, a present-day stream or drainage network.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, ***hardpan, fragipan, claypan, plowpan,*** and ***traffic pan***.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedisediment. A thin layer of alluvial material that mantles an erosion surface and has been transported to its present position from higher lying areas of the erosion surface.

Pedon. The smallest volume that can be called “a soil.” A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The movement of water through the soil.

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:

Impermeable	less than 0.0015 inch
Very slow	0.0015 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid or very rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning. Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed 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.

Regeneration. The new growth of a natural plant community, developing from seed.

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.

Rill. A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Riser. The relatively short, steeply sloping area below a terrace tread that grades to a lower terrace tread or base level.

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.

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.

Saline soil. A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saprolite. Unconsolidated residual material underlying the soil and grading to hard bedrock below.

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.

Second bottom. The first terrace above the normal flood plain (or first bottom) of a river.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

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

Shoulder. The position that forms the uppermost inclined surface near the top of a hillslope. It is a transition from backslope to summit. The surface is dominantly convex in profile and erosional in origin.

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.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silica-sesquioxide ratio. The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

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

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

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.

Sinkhole. A depression in the landscape where limestone has been dissolved.

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.

Skid trails. Pathways along which logs are dragged to a common site for loading onto a logging truck.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

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.

Sodic (alkali) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Sodicity. The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of Na^+ to $Ca^{++} + Mg^{++}$. The degrees of sodicity and their respective ratios are:

Slight	less than 13:1
Moderate	13-30:1
Strong	more than 30:1

Sodium adsorption ratio (SAR). A measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration.

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief and by the passage of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Spoil bank. Rock debris, banks, and earthy dump deposits resulting from the excavation of ditches and strip mines.

Stone line. A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

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.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Strath terrace. A surface cut formed by the erosion of hard or semiconsolidated bedrock and thinly mantled with stream deposits.

Stream channel. The hollow bed where a natural stream of surface water flows or may flow; the deepest or central part of the bed, formed by the main current and covered more or less continuously by water.

Stream terrace. One of a series of platforms in a stream valley, flanking and more or less parallel to the stream channel. It originally formed near the level of the stream and is the dissected remnants of an abandoned flood plain, streambed, or valley floor that were produced during a former stage of erosion or deposition.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—***platy*** (laminated), ***prismatic*** (vertical axis of aggregates longer than horizontal), ***columnar*** (prisms with rounded tops), ***blocky*** (angular or subangular), and ***granular***. ***Structureless*** soils are either ***single grain*** (each grain by itself, as in dune sand) or ***massive*** (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

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

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summit. The topographically highest position of a hillslope. It has a nearly level (planar or only slightly convex) surface.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the “plow layer,” or the “Ap horizon.”

Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are ***sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,*** and ***clay***. The sand, loamy sand, and sandy loam classes may be further divided by specifying “coarse,” “fine,” or “very fine.”

Thin layer (in tables). Otherwise suitable soil material that is too thin for the specified use.

Till plain. An extensive area of nearly level to undulating soils underlain by glacial till.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope. The position that forms the gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Trafficability. The degree to which a soil is capable of supporting vehicular traffic across a wide range in soil moisture conditions.

Tread. The relatively flat terrace surface that was cut or built by stream or wave action.

Understory. Any plants in a forest community that grow to a height of less than 5 feet.

Upland. Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Valley. An elongated depressional area primarily developed by stream action.

Valley fill. In glaciated regions, material deposited in stream valleys by glacial meltwater. In nonglaciated regions, alluvium deposited by heavily loaded streams.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Varve. A sedimentary layer or a lamina or sequence of laminae deposited in a body of still water within a year. Specifically, a thin pair of graded glaciolacustrine layers seasonally deposited, usually by meltwater streams, in a glacial lake or other body of still water in front of a glacier.

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.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Windthrow. The uprooting and tipping over of trees by the wind.

Tables

Table 1.--Temperature and Precipitation

(Recorded in the period 1961-90 at Havana, Illinois)

Month	Temperature						Precipitation				
				2 years in 10 will have--				2 years in 10 will have--			
	Average daily maximum	Average daily minimum	Average	Maximum temperature higher than--	Minimum temperature lower than--	Average number of growing degree days*	Average	Less than--	More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January----	32.8	14.5	23.7	62	-17	1	1.78	0.64	2.72	4	7.5
February---	37.6	18.5	28.1	68	-14	3	1.70	1.00	2.44	4	7.1
March------	51.5	30.7	41.1	81	7	44	3.03	1.72	4.19	6	3.4
April------	64.8	41.6	53.2	89	22	171	3.48	1.73	4.99	6	.7
May--------	74.4	50.9	62.6	93	33	390	3.87	2.04	5.48	7	.0
June-------	84.5	61.2	72.8	99	45	673	3.67	1.61	5.43	5	.0
July-------	88.6	65.1	76.8	101	50	824	4.03	1.92	5.85	6	.0
August-----	85.9	62.4	74.1	99	47	746	3.39	1.60	4.92	5	.0
September--	79.7	54.5	67.1	96	34	512	3.81	1.54	5.72	6	.0
October----	66.9	42.6	54.8	88	23	201	2.95	1.55	4.37	5	.1
November---	51.4	32.3	41.8	76	9	39	2.88	1.24	4.28	5	1.4
December---	37.6	20.7	29.2	66	-11	5	2.74	1.34	3.95	5	5.8
Yearly:											
Average---	63.0	41.3	52.1	---	---	---	---	---	---	---	---
Extreme---	106	-26	---	104	-19	---	---	---	---	---	---
Total-----	---	---	---	---	---	3,611	37.32	30.08	43.31	64	26.0

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

Table 2.--Freeze Dates in Spring and Fall

(Recorded in the period 1961-90 at Havana, Illinois)

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--	Apr. 11	Apr. 15	Apr. 29
2 years in 10 later than--	Apr. 7	Apr. 12	Apr. 25
5 years in 10 later than--	Mar. 29	Apr. 5	Apr. 16
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 20	Oct. 9	Sept. 28
2 years in 10 earlier than--	Oct. 25	Oct. 15	Oct. 3
5 years in 10 earlier than--	Nov. 5	Oct. 26	Oct. 11

Table 3.--Growing Season

(Recorded in the period 1961-90 at Havana, Illinois)

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	199	186	160
8 years in 10	206	191	166
5 years in 10	219	202	178
2 years in 10	232	213	190
1 year in 10	238	219	197

Table 4.--Classification of the Soils

(An asterisk in the first column indicates a taxadjunct to the series. See text for a description of those characteristics that are outside the range of the series)

Soil name	Family or higher taxonomic class
Ambraw	Fine-loamy, mixed, superactive, mesic Fluvaquentic Endoaquolls
*Assumption	Fine-silty, mixed, superactive, mesic Oxyaquic Argiudolls
Atlas	Fine, smectitic, mesic Aeric Chromic Vertic Epiaqualfs
Batavia	Fine-silty, mixed, superactive, mesic Mollic Hapludalfs
Beaucoup	Fine-silty, mixed, superactive, mesic Fluvaquentic Endoaquolls
Blyton	Coarse-silty, mixed, superactive, nonacid, mesic Oxyaquic Udifluvents
Breeds	Fine-silty, mixed, superactive, mesic Aquic Hapludolls
Camden	Fine-silty, mixed, superactive, mesic Typic Hapludalfs
Chelsea	Mixed, mesic Lamellic Udipsamments
Clarksdale	Fine, smectitic, mesic Udollic Endoaqualfs
Coot	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Aquic Argiudolls
Copperas	Fine-silty, mixed, superactive, mesic Fluvaquentic Endoaquolls
Dakota	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Typic Argiudolls
Denny	Fine, smectitic, mesic Mollic Albaqualfs
Drury	Fine-silty, mixed, superactive, mesic Dystric Eutrudepts
Elburn	Fine-silty, mixed, superactive, mesic Aquic Argiudolls
Elco	Fine-silty, mixed, superactive, mesic Oxyaquic Hapludalfs
*Elkhart	Fine-silty, mixed, superactive, mesic Typic Argiudolls
Fayette	Fine-silty, mixed, superactive, mesic Typic Hapludalfs
Greenbush	Fine-silty, mixed, superactive, mesic Mollic Hapludalfs
Hickory	Fine-loamy, mixed, active, mesic Typic Hapludalfs
Huntsville	Fine-silty, mixed, superactive, mesic Cumulic Hapludolls
Ipava	Fine, smectitic, mesic Aquic Argiudolls
Kendall	Fine-silty, mixed, superactive, mesic Aeric Endoaqualfs
Keomah	Fine, smectitic, mesic Aeric Endoaqualfs
*La Hogue	Fine-loamy, mixed, superactive, mesic Aquic Argiudolls
Lawson	Fine-silty, mixed, superactive, mesic Aquic Cumulic Hapludolls
Lenzburg	Fine-loamy, mixed, active, calcareous, mesic Alfic Udarents
Lenzlo	Fine-loamy, mixed, active, calcareous, mesic Mollic Endoaquents
Lenzwheel	Fine-loamy, mixed, active, calcareous, mesic Alfic Udarents
Littleton	Fine-silty, mixed, superactive, mesic Aquic Cumulic Hapludolls
Marbletown	Fine-loamy, mixed, superactive, mesic Typic Argiudolls
Marseilles	Fine-silty, mixed, superactive, mesic Typic Hapludalfs
Martinsville	Fine-loamy, mixed, active, mesic Typic Hapludalfs
Mudhen	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Typic Endoaquolls
Navlys	Fine-silty, mixed, superactive, mesic Typic Hapludalfs
Onarga	Coarse-loamy, mixed, superactive, mesic Typic Argiudolls
Orion	Coarse-silty, mixed, superactive, nonacid, mesic Aquic Udifluvents
Orthents	Fine-silty, mixed, active, nonacid, mesic Aquic Udorthents
Osco	Fine-silty, mixed, superactive, mesic Typic Argiudolls
*Plano	Fine-silty, mixed, superactive, mesic Typic Argiudolls
Quiver	Fine-silty, mixed, superactive, nonacid, mesic Mollic Fluvaquents
Raddle	Fine-silty, mixed, superactive, mesic Typic Hapludolls
Radford	Fine-silty, mixed, superactive, mesic Fluvaquentic Hapludolls
Rapatee	Fine-silty, mixed, superactive, nonacid, mesic Alfic Udarents
Rozetta	Fine-silty, mixed, superactive, mesic Typic Hapludalfs
Rushville	Fine, smectitic, mesic Typic Albaqualfs
Sable	Fine-silty, mixed, superactive, mesic Typic Endoaquolls
Sarpy	Mixed, mesic Typic Udipsamments
Sawmill	Fine-silty, mixed, superactive, mesic Cumulic Endoaquolls
Schuline	Fine-loamy, mixed, superactive, calcareous, mesic Typic Udorthents
Seaton	Fine-silty, mixed, superactive, mesic Typic Hapludalfs
Sepo	Fine-silty, mixed, superactive, mesic Fluvaquentic Endoaquolls
Shaffton	Fine-loamy, mixed, superactive, mesic Fluvaquentic Hapludolls
Sparta	Sandy, mixed, mesic Entic Hapludolls
St. Charles	Fine-silty, mixed, superactive, mesic Typic Hapludalfs

Table 4.--Classification of the Soils--Continued

Soil name	Family or higher taxonomic class
Sylvan	Fine-silty, mixed, superactive, mesic Typic Hapludalfs
Tice	Fine-silty, mixed, superactive, mesic Fluvaquentic Hapludolls
Timula	Coarse-silty, mixed, superactive, mesic Typic Eutrudepts
Titus	Fine, smectitic, mesic Vertic Endoaquolls
Virgil	Fine-silty, mixed, superactive, mesic Udollic Endoaqualfs
Wakeland	Coarse-silty, mixed, superactive, nonacid, mesic Aeric Fluvaquents
Worthen	Fine-silty, mixed, superactive, mesic Cumulic Hapludolls

Table 5.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
7C3	Atlas silty clay loam, 5 to 10 percent slopes, severely eroded	255	*
7D3	Atlas silty clay loam, 10 to 18 percent slopes, severely eroded	543	0.1
8D2	Hickory silt loam, 10 to 18 percent slopes, eroded	2,369	0.4
8E2	Hickory loam, 18 to 25 percent slopes, eroded	20,038	3.5
8F	Hickory silt loam, 18 to 35 percent slopes	36,182	6.4
8G	Hickory silt loam, 35 to 60 percent slopes	14,553	2.6
16A	Rushville silt loam, 0 to 2 percent slopes	239	*
17A	Keomah silt loam, 0 to 2 percent slopes	20,259	3.6
17B	Keomah silt loam, 2 to 5 percent slopes	106	*
19D3	Sylvan silty clay loam, 10 to 18 percent slopes, severely eroded	7,365	1.3
37B	Worthen silt loam, 2 to 5 percent slopes	1,527	0.3
43A	Ipava silt loam, 0 to 2 percent slopes	45,608	8.2
45A	Denny silt loam, 0 to 2 percent slopes	664	0.1
68A	Sable silty clay loam, 0 to 2 percent slopes	16,043	2.8
75B	Drury silt loam, 2 to 5 percent slopes	709	0.2
75C2	Drury silt loam, 5 to 10 percent slopes, eroded	1,506	0.3
86B	Osco silt loam, 2 to 5 percent slopes	16,922	3.1
86C2	Osco silt loam, 5 to 10 percent slopes, eroded	3,522	0.6
88B	Sparta loamy fine sand, 1 to 7 percent slopes	203	*
102A	La Hogue loam, 0 to 2 percent slopes	196	*
104A	Virgil silt loam, 0 to 2 percent slopes	123	*
105B2	Batavia silt loam, 2 to 5 percent slopes, eroded	86	*
119D2	Elco silt loam, 10 to 18 percent slopes, eroded	6,355	1.1
119E2	Elco silt loam, 18 to 25 percent slopes, eroded	4,839	0.9
134C2	Camden silt loam, 5 to 10 percent slopes, eroded	1,707	0.3
134D2	Camden silt loam, 10 to 18 percent slopes, eroded	1,250	0.2
134E2	Camden silt loam, 18 to 25 percent slopes, eroded	863	0.2
150B	Onarga fine sandy loam, 2 to 5 percent slopes	372	*
198A	Elburn silt loam, 0 to 2 percent slopes	267	*
199B	Plano silt loam, 2 to 5 percent slopes	632	0.1
242A	Kendall silt loam, 0 to 2 percent slopes	554	0.1
243B	St. Charles silt loam, 2 to 5 percent slopes	1,502	0.3
257A	Clarksdale silt loam, 0 to 2 percent slopes	16,441	2.9
259C2	Assumption silt loam, 5 to 10 percent slopes, eroded	507	0.1
271D2	Timula silt loam, 10 to 18 percent slopes, eroded	441	0.1
274E2	Seaton silt loam, 18 to 25 percent slopes, eroded	5,064	0.9
274F	Seaton silt loam, 18 to 35 percent slopes	4,020	0.7
274G	Seaton silt loam, 35 to 60 percent slopes	1,184	0.2
279B	Rozetta silt loam, 2 to 5 percent slopes	74,905	13.4
279C2	Rozetta silt loam, 5 to 10 percent slopes, eroded	44,842	8.0
279C3	Rozetta silty clay loam, 5 to 10 percent slopes, severely eroded	578	0.1
280B2	Fayette silt loam, 2 to 5 percent slopes, eroded	4,416	0.8
280C2	Fayette silt loam, 5 to 10 percent slopes, eroded	8,030	1.4
280D2	Fayette silt loam, 10 to 18 percent slopes, eroded	9,437	1.7
280E2	Fayette silt loam, 18 to 25 percent slopes, eroded	2,289	0.4
379A	Dakota loam, 0 to 2 percent slopes	205	*
379B	Dakota loam, 2 to 5 percent slopes	438	0.1
430B	Raddle silt loam, 2 to 5 percent slopes	1,723	0.3
536	Dumps, mine	1,366	0.2
549F	Marseilles silt loam, 18 to 35 percent slopes	1,706	0.3
549G	Marseilles silt loam, 35 to 60 percent slopes	2,229	0.4
558A	Breeds silty clay loam, 0 to 2 percent slopes	116	*
567B2	Elkhart silty clay loam, 2 to 5 percent slopes, eroded	17	*
567C2	Elkhart silty clay loam, 5 to 10 percent slopes, eroded	159	*
570B	Martinsville loam, 2 to 5 percent slopes	374	*
596B	Marbletown silt loam, 2 to 5 percent slopes	578	0.1
630C3	Navlys silty clay loam, 5 to 10 percent slopes, severely eroded	11,449	2.0
632A	Copperas silty clay loam, 0 to 2 percent slopes	42	*
675B	Greenbush silt loam, 2 to 5 percent slopes	9,679	1.8
779B	Chelsea loamy fine sand, 1 to 7 percent slopes	233	*
779D	Chelsea loamy fine sand, 7 to 20 percent slopes	274	*
801B	Orthents, silty, undulating	1,388	0.3

See footnote at end of table.

Table 5.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
823B	Schuline silty clay loam, 1 to 7 percent slopes	1,719	0.3
823D	Schuline silty clay loam, 7 to 20 percent slopes	277	*
865	Pits, gravel	522	0.1
871B	Lenzburg silt loam, 1 to 7 percent slopes	13,575	2.4
871D	Lenzburg silty clay loam, 7 to 20 percent slopes	7,195	1.3
871G	Lenzburg silty clay loam, 20 to 60 percent slopes	13,232	2.3
872B	Rapatee silty clay loam, 2 to 5 percent slopes	1,770	0.3
876B	Lenzwheel silt loam, 1 to 7 percent slopes	4,879	0.9
876D	Lenzwheel silty clay loam, 7 to 20 percent slopes	3,188	0.6
876G	Lenzwheel silty clay loam, 20 to 60 percent slopes	2,538	0.4
3070A	Beaucoup silty clay loam, 0 to 2 percent slopes, frequently flooded	7,231	1.3
3074A	Radford silt loam, 0 to 2 percent slopes, frequently flooded	573	0.1
3077A	Huntsville silt loam, 0 to 2 percent slopes, frequently flooded	2,024	0.4
3107A	Sawmill silty clay loam, 0 to 2 percent slopes, frequently flooded	3,151	0.6
3284A	Tice silty clay loam, 0 to 2 percent slopes, frequently flooded	8,851	1.6
3333A	Wakeland silt loam, 0 to 2 percent slopes, frequently flooded	13,909	2.5
3404A	Titus silty clay, 0 to 2 percent slopes, frequently flooded	856	0.2
3415A	Orion silt loam, 0 to 2 percent slopes, frequently flooded	4,421	0.8
3451A	Lawson silt loam, 0 to 2 percent slopes, frequently flooded	11,413	2.0
3634A	Blyton silt loam, 0 to 2 percent slopes, frequently flooded	2,390	0.4
3641L	Quiver silty clay loam, 0 to 2 percent slopes, frequently flooded, long duration	2,396	0.4
7081A	Littleton silt loam, 0 to 2 percent slopes, rarely flooded	577	0.1
8070A	Beaucoup silty clay loam, 0 to 2 percent slopes, occasionally flooded	5,162	0.9
8092B	Sarpy sand, 1 to 7 percent slopes, occasionally flooded	102	*
8183A	Shaffton clay loam, 0 to 2 percent slopes, occasionally flooded	254	*
8284A	Tice silty clay loam, 0 to 2 percent slopes, occasionally flooded	3,237	0.6
8302A	Ambraw clay loam, 0 to 2 percent slopes, occasionally flooded	563	0.1
8404A	Titus silty clay, 0 to 2 percent slopes, occasionally flooded	11,518	2.0
8415A	Orion silt loam, 0 to 2 percent slopes, occasionally flooded	1,694	0.3
8595A	Coot loam, 0 to 2 percent slopes, occasionally flooded	277	*
8608A	Mudhen clay loam, 0 to 2 percent slopes, occasionally flooded	179	*
8611A	Sepo silty clay loam, 0 to 2 percent slopes, occasionally flooded	970	0.2
8875B	Lenzlo silty clay loam, 1 to 7 percent slopes, occasionally flooded	1,031	0.2
9017A	Keomah silt loam, terrace, 0 to 2 percent slopes	590	0.1
9068A	Sable silty clay loam, terrace, 0 to 2 percent slopes	152	*
9257A	Clarksdale silt loam, terrace, 0 to 2 percent slopes	321	*
9279B	Rozetta silt loam, terrace, 2 to 5 percent slopes	1,870	0.3
9279C	Rozetta silt loam, terrace, 5 to 10 percent slopes, eroded	1,022	0.2
W	Water	9,905	1.8
	Total	557,023	100.0

* Less than 0.1 percent.

Table 6.--Main Cropland Limitations and Hazards

(Only the soils commonly used as cropland are listed. See text for definitions of terms used in this table)

Map symbol and soil name	Cropland limitations or hazards
7C3:	
Atlas	Frost heave Low fertility Low pH Water erosion Wetness
7D3:	
Atlas	Crusting Poor tilth Water erosion Wetness
8D2:	
Hickory	Crusting Water erosion
16A:	
Rushville	Crusting Ponding
17A:	
Keomah	Crusting Wetness
17B:	
Keomah	Crusting Water erosion Wetness
19D3:	
Sylvan	Crusting Poor tilth Water erosion
37B:	
Worthen	Water erosion
43A:	
Ipava	Wetness
45A:	
Denny	Ponding
68A:	
Sable	Ponding Poor tilth
75B:	
Drury	Water erosion
75C2:	
Drury	Crusting Water erosion
86B:	
Osco	Water erosion
86C2:	
Osco	Water erosion

Table 6.--Main Cropland Limitations and Hazards--Continued

Map symbol and soil name	Cropland limitations or hazards
88B:	
Sparta	Excessive permeability Low available water capacity Water erosion Wind erosion
102A:	
La Hogue	Wetness
104A:	
Virgil	Wetness
105B2:	
Batavia	Crusting Water erosion
119D2:	
Elco	Crusting Water erosion
134C2:	
Camden	Crusting Water erosion
134D2:	
Camden	Crusting Water erosion
150B:	
Onarga	Excessive permeability Water erosion
198A:	
Elburn	Wetness
199B:	
Plano	Water erosion
242A:	
Kendall	Crusting Wetness
243B:	
St. Charles	Crusting Water erosion
257A:	
Clarksdale	Crusting Wetness
259C2:	
Assumption	Water erosion
271D2:	
Timula	Water erosion
279B:	
Rozetta	Crusting Water erosion
279C2:	
Rozetta	Crusting Water erosion

Table 6.--Main Cropland Limitations and Hazards--Continued

Map symbol and soil name	Cropland limitations or hazards
279C3:	
Rozetta	Crusting Poor tilth Water erosion
280B2:	
Fayette	Crusting Water erosion
280C2:	
Fayette	Crusting Water erosion
280D2:	
Fayette	Crusting Water erosion
379A:	
Dakota	Excessive permeability
379B:	
Dakota	Excessive permeability Water erosion
430B:	
Raddle	Water erosion
558A:	
Breeds	Poor tilth Water erosion Wetness
567B2:	
Elkhart	Crusting Poor tilth Water erosion
567C2:	
Elkhart	Crusting Poor tilth Water erosion
570B:	
Martinsville	Water erosion
596B:	
Marbletown	Water erosion
630C3:	
Navlys	Crusting Poor tilth Water erosion
632A:	
Copperas	Ponding Poor tilth
675B:	
Greenbush	Crusting Water erosion

Table 6.--Main Cropland Limitations and Hazards--Continued

Map symbol and soil name	Cropland limitations or hazards
779B:	
Chelsea	Excessive permeability Low available water capacity Water erosion Wind erosion
801B:	
Orthents	Crusting Water erosion
823B:	
Schuline	Crusting Poor tilth Water erosion
823D:	
Schuline	Crusting Poor tilth Water erosion
871B:	
Lenzburg	Crusting Water erosion
871D:	
Lenzburg	Crusting Poor tilth Water erosion
872B:	
Rapatee	Water erosion
876B:	
Lenzwheel	Crusting Water erosion
876D:	
Lenzwheel	Crusting Poor tilth Water erosion
3070A:	
Beaucoup	Flooding Ponding Poor tilth
3074A:	
Radford	Flooding Wetness
3077A:	
Huntsville	Flooding
3107A:	
Sawmill	Flooding Poor tilth Wetness
3284A:	
Tice	Crusting Flooding Poor tilth Wetness

Table 6.--Main Cropland Limitations and Hazards--Continued

Map symbol and soil name	Cropland limitations or hazards
3333A:	
Wakeland	Flooding Wetness
3404A:	
Titus	Flooding Ponding Poor tilth
3415A:	
Orion	Flooding Wetness
3451A:	
Lawson	Flooding Wetness
3634A:	
Blyton	Flooding
7081A:	
Littleton	Wetness
8070A:	
Beaucoup	Flooding Ponding Poor tilth
8092B:	
Sarpy	Excessive permeability Flooding Low available water capacity Wind erosion
8183A:	
Shaffton	Crusting Excessive permeability Flooding Poor tilth Wetness
8284A:	
Tice	Crusting Flooding Poor tilth Wetness
8302A:	
Ambraw	Crusting Flooding Wetness
8404A:	
Titus	Flooding Ponding Poor tilth
8415A:	
Orion	Flooding Wetness

Table 6.--Main Cropland Limitations and Hazards--Continued

Map symbol and soil name	Cropland limitations or hazards
8595A:	
Coot	Excessive permeability Flooding Wetness
8608A:	
Mudhen	Excessive permeability Flooding Ponding Poor tilth
8611A:	
Sepo	Flooding Ponding Poor tilth
9017A:	
Keomah	Crusting Wetness
9068A:	
Sable	Ponding Poor tilth
9257A:	
Clarksdale	Crusting Wetness
9279B:	
Rozetta	Crusting Water erosion
9279C:	
Rozetta	Crusting Water erosion

Table 7.--Main Pasture Limitations and Hazards

(Only the soils commonly used for pasture are listed. See text for definitions of terms used in this table)

Map symbol and soil name	Pasture limitations or hazards
7C3:	
Atlas	Frost heave Low fertility Low pH Water erosion Wetness
7D3:	
Atlas	Equipment limitations Frost heave Low fertility Low pH Water erosion Wetness
8D2:	
Hickory	Equipment limitations Frost heave Low pH Water erosion
8E2:	
Hickory	Equipment limitations Frost heave Low pH Water erosion
16A:	
Rushville	Frost heave Low pH Ponding
17A:	
Keomah	Frost heave Low pH Wetness
17B:	
Keomah	Frost heave Low pH Water erosion Wetness
19D3:	
Sylvan	Equipment limitations Frost heave Low fertility Water erosion
75B:	
Drury	Frost heave Water erosion
75C2:	
Drury	Frost heave Water erosion

Table 7.--Main Pasture Limitations and Hazards--Continued

Map symbol and soil name	Pasture limitations or hazards
86C2:	
Osco	Frost heave Low pH Water erosion
88B:	
Sparta	Low pH Water erosion Wind erosion
104A:	
Virgil	Frost heave Low pH Wetness
105B2:	
Batavia	Frost heave Water erosion
119D2:	
Elco	Equipment limitations Frost heave Low pH Water erosion
119E2:	
Elco	Equipment limitations Frost heave Low pH Water erosion
134C2:	
Camden	Frost heave Low pH Water erosion
134D2:	
Camden	Equipment limitations Frost heave Low pH Water erosion
134E2:	
Camden	Equipment limitations Frost heave Low pH Water erosion
242A:	
Kendall	Frost heave Low pH Wetness
243B:	
St. Charles	Frost heave Low pH Water erosion
257A:	
Clarksdale	Frost heave Low pH Wetness

Table 7.--Main Pasture Limitations and Hazards--Continued

Map symbol and soil name	Pasture limitations or hazards
259C2:	
Assumption	Frost heave Low pH Water erosion
271D2:	
Timula	Equipment limitations Frost heave Water erosion
274E2:	
Seaton	Equipment limitations Frost heave Low pH Water erosion
279B:	
Rozetta	Frost heave Low pH Water erosion
279C2:	
Rozetta	Frost heave Low pH Water erosion
279C3:	
Rozetta	Frost heave Low fertility Low pH Water erosion
280B2:	
Fayette	Frost heave Low pH Water erosion
280C2:	
Fayette	Frost heave Low pH Water erosion
280D2:	
Fayette	Equipment limitations Frost heave Low pH Water erosion
280E2:	
Fayette	Equipment limitations Frost heave Low pH Water erosion
570B:	
Martinsville	Frost heave Low pH Water erosion
630C3:	
Navlys	Frost heave Low fertility Water erosion

Table 7.--Main Pasture Limitations and Hazards--Continued

Map symbol and soil name	Pasture limitations or hazards
675B:	
Greenbush	Frost heave
	Low pH
	Water erosion
779B:	
Chelsea	Low fertility
	Low pH
	Water erosion
	Wind erosion
779D:	
Chelsea	Equipment limitations
	Low fertility
	Low pH
	Water erosion
	Wind erosion
801B:	
Orthents	Frost heave
	Low fertility
	Low pH
	Water erosion
823B:	
Schuline	Frost heave
	Water erosion
823D:	
Schuline	Frost heave
	Water erosion
871B:	
Lenzburg	Frost heave
	Water erosion
871D:	
Lenzburg	Equipment limitations
	Frost heave
	Water erosion
872B:	
Rapatee	Frost heave
	Low fertility
	Water erosion
876B:	
Lenzwheel	Frost heave
	Water erosion
876D:	
Lenzwheel	Equipment limitations
	Frost heave
	Water erosion
3333A:	
Wakeland	Flooding
	Frost heave
	Wetness
3415A:	
Orion	Flooding
	Frost heave
	Wetness

Table 7.--Main Pasture Limitations and Hazards--Continued

Map symbol and soil name	Pasture limitations or hazards
3634A:	
Blyton	Flooding
	Frost heave
8092B:	
Sarpy	Flooding
	Low available water capacity
	Low fertility
	Wind erosion
8415A:	
Orion	Flooding
	Frost heave
	Wetness
9017A:	
Keomah	Frost heave
	Low pH
	Wetness
9257A:	
Clarksdale	Frost heave
	Low pH
	Wetness
9279B:	
Rozetta	Frost heave
	Low pH
	Water erosion
9279C:	
Rozetta	Frost heave
	Low pH
	Water erosion

Table 8.--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	Corn	Soybeans	Winter wheat	Oats	Grass-legume hay	Pasture
		Bu	Bu	Bu	Bu	Tons	AUM*
7C3:							
Atlas	4e	49	16	16	36	2.2	3.0
7D3:							
Atlas	6e	---	---	---	---	2.8	1.7
8D2:							
Hickory	3e	72	23	26	50	2.7	4.5
8E2:							
Hickory	6e	---	---	---	---	2.1	3.6
8F:							
Hickory	7e	---	---	---	---	---	3.0
8G:							
Hickory	7e	---	---	---	---	---	---
16A:							
Rushville	3w	114	36	---	64	4.2	7.0
17A:							
Keomah	2w	129	39	52	72	5.1	8.5
17B:							
Keomah	2e	128	39	52	70	5.0	8.3
19D3:							
Sylvan	4e	93	29	44	55	4.2	6.9
37B:							
Worthen	2e	151	46	62	88	5.9	9.6
43A:							
Ipava	1	163	52	66	91	---	---
45A:							
Denny	3w	113	37	---	62	---	---
68A:							
Sable	2w	156	51	---	85	---	---
75B:							
Drury	2e	125	40	56	76	4.9	8.2
75C2:							
Drury	3e	118	38	54	72	4.7	7.8
86B:							
Osco	2e	153	46	61	88	---	---
86C2:							
Osco	2e	146	43	58	84	5.5	9.2
88B:							
Sparta	4s	84	28	36	52	3.3	5.5

See footnote at end of table.

Table 8.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Oats	Grass-legume hay	Pasture
		Bu	Bu	Bu	Bu	Tons	AUM*
102A:							
La Hogue------------	1	129	43	56	80	5.2	8.7
104A:							
Virgil--------------	1	148	45	60	84	5.2	9.3
105B2:							
Batavia-------------	2e	137	43	54	80	5.1	8.9
119D2:							
Elco----------------	3e	101	33	42	58	4.0	6.6
119E2:							
Elco----------------	6e	---	---	---	---	3.4	5.6
134C2:							
Camden--------------	3e	117	37	52	68	4.7	7.8
134D2:							
Camden--------------	3e	111	35	49	64	4.5	7.4
134E2:							
Camden--------------	6e	---	---	---	---	3.5	5.8
150B:							
Onarga--------------	2e	108	36	48	73	4.8	7.0
198A:							
Elburn--------------	1	161	50	63	94	6.1	10.2
199B:							
Plano---------------	2e	150	45	60	89	5.8	9.6
242A:							
Kendall-------------	2w	135	41	55	75	5.2	8.7
243B:							
St. Charles---------	2e	126	39	55	72	5.0	8.1
257A:							
Clarksdale----------	1	140	43	57	79	5.3	8.8
259C2:							
Assumption----------	3e	120	37	54	74	4.8	8.0
271D2:							
Timula--------------	3e	89	30	---	54	3.6	6.0
274E2:							
Seaton--------------	6e	---	---	---	---	3.5	5.7
274F:							
Seaton--------------	7e	---	---	---	---	---	---
274G:							
Seaton--------------	7e	---	---	---	---	---	---
279B:							
Rozetta-------------	2e	130	40	53	72	5.1	8.6

See footnote at end of table.

Table 8.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Oats	Grass-legume hay	Pasture
		Bu	Bu	Bu	Bu	Tons	AUM*
279C2:							
Rozetta-------------	3e	123	38	51	69	4.9	8.2
279C3:							
Rozetta-------------	4e	112	35	46	62	4.4	7.4
280B2:							
Fayette-------------	2e	124	37	51	70	5.0	8.6
280C2:							
Fayette-------------	3e	121	37	50	69	4.9	8.2
280D2:							
Fayette-------------	3e	116	35	48	66	4.7	7.4
280E2:							
Fayette-------------	6e	---	---	---	---	4.5	7.2
379A:							
Dakota--------------	2s	148	45	58	67	---	---
379B:							
Dakota--------------	2e	105	35	50	66	---	---
430B:							
Raddle--------------	2e	148	45	58	82	5.7	9.6
536:							
Dumps, mine.							
549F:							
Marseilles----------	7e	---	---	---	---	---	---
549G:							
Marseilles----------	7e	---	---	---	---	---	---
558A:							
Breeds--------------	1	50	---	63	94	6.1	10.2
567B2:							
Elkhart-------------	2e	124	37	50	69	---	---
567C2:							
Elkhart-------------	3e	120	35	48	66	4.7	7.9
570B:							
Martinsville--------	2e	120	42	48	65	4.0	7.9
596B:							
Marbletown----------	2e	148	45	58	82	---	---
630C3:							
Navlys--------------	4e	97	30	46	57	4.3	7.2
632A:							
Copperas------------	2w	138	46	---	75	---	---
675B:							
Greenbush-----------	2e	---	---	---	---	---	---

See footnote at end of table.

Table 8.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Oats	Grass-legume hay	Pasture
		Bu	Bu	Bu	Bu	Tons	AUM*
779B:							
Chelsea-------------	4s	68	23	---	41	---	---
779D:							
Chelsea-------------	6s	60	---	---	---	---	---
801B:							
Orthents------------	2e	81	21	28	---	4.4	---
823B:							
Schuline------------	2e	92	31	34	---	---	---
823D:							
Schuline------------	3e	91	31	33	---	---	---
865:							
Pits, gravel.							
871B:							
Lenzburg------------	2e	75	23	26	---	---	---
871D:							
Lenzburg------------	4e	70	---	24	---	---	---
871G:							
Lenzburg------------	7e	---	---	---	---	---	---
872B:							
Rapatee-------------	2e	100	35	47	---	---	---
876B:							
Lenzwheel-----------	2e	---	---	---	---	---	---
876D:							
Lenzwheel-----------	2e	---	---	---	---	---	---
876G:							
Lenzwheel-----------	6e	---	---	---	---	---	---
3070A:							
Beaucoup------------	3w	117	39	47	---	---	---
3074A:							
Radford-------------	3w	100	32	---	59	3.9	---
3077A:							
Huntsville----------	2w	106	34	45	60	---	---
3107A:							
Sawmill-------------	3w	132	42	---	---	---	---
3284A:							
Tice----------------	3w	110	34	---	---	---	---
3333A:							
Wakeland------------	2w	120	42	---	---	---	---
3404A:							
Titus---------------	4w	75	25	31	41	---	---

See footnote at end of table.

Table 8.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Oats	Grass-legume hay	Pasture
		Bu	Bu	Bu	Bu	Tons	AUM*
3415A:							
Orion	3w	80	26	---	58	---	---
3451A:							
Lawson	3w	120	39	---	72	---	---
3634A:							
Blyton	2w	120	42	48	---	---	---
3641L:							
Quiver	5w	---	---	---	---	---	---
7081A:							
Littleton	1	159	50	63	90	6.1	---
8070A:							
Beaucoup	2w	138	44	52	---	---	---
8092B:							
Sarpy	4s	---	---	20	30	---	---
8183A:							
Shaffton	2w	130	40	---	78	---	---
8284A:							
Tice	2w	130	40	---	---	---	---
8302A:							
Ambraw	2w	132	43	52	70	---	---
8404A:							
Titus	3w	125	42	52	68	---	---
8415A:							
Orion	2w	125	41	---	75	---	---
8595A:							
Coot	2s	---	---	---	---	---	---
8608A:							
Mudhen	2w	---	---	---	---	---	---
8611A:							
Sepo	2w	---	---	---	---	---	---
8875B:							
Lenzlo	2e	---	---	---	---	---	---
9017A:							
Keomah	2w	131	44	---	72	---	---
9068A:							
Sable	2w	156	51	61	85	---	---
9257A:							
Clarksdale	1	140	43	57	79	5.3	---
9279B:							
Rozetta	2e	130	40	53	72	---	---

See footnote at end of table.

Table 8.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Oats	Grass-legume hay	Pasture
		Bu	Bu	Bu	Bu	Tons	AUM*
9279C:							
Rozetta-------------	3e	123	38	51	69	---	---

* Animal unit month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

Table 9.--Prime Farmland

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland. If a soil is prime farmland only under certain conditions, the conditions are specified in parentheses after the soil name)

Map symbol	Soil name
17A	Keomah silt loam, 0 to 2 percent slopes (where drained)
17B	Keomah silt loam, 2 to 5 percent slopes
37B	Worthen silt loam, 2 to 5 percent slopes
43A	Ipava silt loam, 0 to 2 percent slopes
45A	Denny silt loam, 0 to 2 percent slopes (where drained)
68A	Sable silty clay loam, 0 to 2 percent slopes (where drained)
75B	Drury silt loam, 2 to 5 percent slopes
86B	Osco silt loam, 2 to 5 percent slopes
88B	Sparta loamy fine sand, 1 to 7 percent slopes
102A	La Hogue loam, 0 to 2 percent slopes
104A	Virgil silt loam, 0 to 2 percent slopes (where drained)
105B2	Batavia silt loam, 2 to 5 percent slopes, eroded
150B	Onarga fine sandy loam, 2 to 5 percent slopes
198A	Elburn silt loam, 0 to 2 percent slopes
199B	Plano silt loam, 2 to 5 percent slopes
242A	Kendall silt loam, 0 to 2 percent slopes (where drained)
243B	St. Charles silt loam, 2 to 5 percent slopes
257A	Clarksdale silt loam, 0 to 2 percent slopes (where drained)
279B	Rozetta silt loam, 2 to 5 percent slopes
280B2	Fayette silt loam, 2 to 5 percent slopes, eroded
379A	Dakota loam, 0 to 2 percent slopes
379B	Dakota loam, 2 to 5 percent slopes
430B	Raddle silt loam, 2 to 5 percent slopes
558A	Breeds silty clay loam, 0 to 2 percent slopes
567B2	Elkhart silty clay loam, 2 to 5 percent slopes, eroded
570B	Martinsville loam, 2 to 5 percent slopes
596B	Marbletown silt loam, 2 to 5 percent slopes
632A	Copperas silty clay loam, 0 to 2 percent slopes (where drained)
675B	Greenbush silt loam, 2 to 5 percent slopes
779B	Chelsea loamy fine sand, 1 to 7 percent slopes (where irrigated)
823B	Schuline silty clay loam, 1 to 7 percent slopes
871B	Lenzburg silt loam, 1 to 7 percent slopes
872B	Rapatee silt loam, 2 to 5 percent slopes
876B	Lenzwheel silt loam, 1 to 7 percent slopes
3070A	Beaucoup silty clay loam, 0 to 2 percent slopes, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
3074A	Radford silt loam, 0 to 2 percent slopes, frequently flooded (where drained)
3077A	Huntsville silt loam, 0 to 2 percent slopes, frequently flooded (where protected from flooding or not frequently flooded during the growing season)
3107A	Sawmill silty clay loam, 0 to 2 percent slopes, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
3284A	Tice silty clay loam, 0 to 2 percent slopes, frequently flooded (where protected from flooding or not frequently flooded during the growing season)
3333A	Wakeland silt loam, 0 to 2 percent slopes, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
3404A	Titus silty clay, 0 to 2 percent slopes, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
3415A	Orion silt loam, 0 to 2 percent slopes, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
3451A	Lawson silt loam, 0 to 2 percent slopes, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
3634A	Blyton silt loam, 0 to 2 percent slopes, frequently flooded (where protected from flooding or not frequently flooded during the growing season)
3641L	Quiver silty clay loam, 0 to 2 percent slopes, frequently flooded, long duration (where drained and either protected from flooding or not frequently flooded during the growing season)
7081A	Littleton silt loam, 0 to 2 percent slopes, rarely flooded
8070A	Beaucoup silty clay loam, 0 to 2 percent slopes, occasionally flooded (where drained)
8183A	Shaffton clay loam, 0 to 2 percent slopes, occasionally flooded
8284A	Tice silty clay loam, 0 to 2 percent slopes, occasionally flooded

Table 9.--Prime Farmland--Continued

Map symbol	Soil name
8302A	Ambraw clay loam, 0 to 2 percent slopes, occasionally flooded (where drained)
8404A	Titus silty clay, 0 to 2 percent slopes, occasionally flooded (where drained)
8415A	Orion silt loam, 0 to 2 percent slopes, occasionally flooded (where drained)
8595A	Coot loam, 0 to 2 percent slopes, occasionally flooded
8608A	Mudhen clay loam, 0 to 2 percent slopes, occasionally flooded (where drained)
8611A	Sepo silty clay loam, 0 to 2 percent slopes, occcasionally flooded (where drained)
8875B	Lenzlo silty clay loam, 1 to 7 percent slopes, occasionally flooded
9068A	Sable silty clay loam, terrace, 0 to 2 percent slopes (where drained)
9257A	Clarksdale silt loam, terrace, 0 to 2 percent slopes (where drained)
9279B	Rozetta silt loam, terrace, 0 to 2 percent slopes

Table 10.--Windbreaks and Environmental Plantings

(Absence of an entry indicates that trees generally do not grow to the given height)

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
7C3:					
Atlas	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf viburnum	American hazelnut, Washington hawthorn, blackhaw, nannyberry, prairie crabapple, shadbush	Baldcypress, eastern redcedar, green ash, northern whitecedar	Norway spruce, eastern white pine, pin oak	Eastern cottonwood
7D3:					
Atlas	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf viburnum	American hazelnut, Washington hawthorn, blackhaw, nannyberry, prairie crabapple, shadbush	Baldcypress, eastern redcedar, green ash, northern whitecedar	Norway spruce, eastern white pine, pin oak	Eastern cottonwood
8D2:					
Hickory	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, eastern white pine, pin oak
8E2:					
Hickory	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, eastern white pine, pin oak
8F:					
Hickory	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, eastern white pine, pin oak
8G:					
Hickory	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, eastern white pine, pin oak

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
16A:					
Rushville	Black chokeberry, coralberry, gray dogwood, mapleleaf viburnum	American plum, blackhaw, nannyberry, prairie crabapple, roughleaf dogwood	Eastern redcedar, hackberry, northern whitecedar, shadbush, witchhazel	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak, tuliptree	Eastern cottonwood, pin oak
17A:					
Keomah	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, eastern white pine, pin oak
17B:					
Keomah	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, eastern white pine, pin oak
19D3:					
Sylvan	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, eastern white pine, pin oak
37B:					
Worthen	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, eastern white pine, pin oak
43A:					
Ipava	Black chokeberry, common winterberry, coralberry, mapleleaf viburnum, silky dogwood	American plum, prairie crabapple, rusty blackhaw, shadbush	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, eastern white pine, pin oak
45A:					
Denny	Black chokeberry, coralberry, gray dogwood, mapleleaf viburnum	American plum, blackhaw, nannyberry, prairie crabapple, roughleaf dogwood	Eastern redcedar, hackberry, northern whitecedar, shadbush, witchhazel	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak, tuliptree	Eastern cottonwood, pin oak

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
68A: Sable	Black chokeberry, coralberry, gray dogwood, mapleleaf viburnum	American plum, blackhaw, nannyberry, prairie crabapple, roughleaf dogwood	Eastern redcedar, hackberry, northern whitecedar, shadbush, witchhazel	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak, tuliptree	Eastern cottonwood, pin oak
75B: Drury	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, eastern white pine, pin oak
75C2: Drury	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, eastern white pine, pin oak
86B: Osco	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, common hackberry, green ash, tuliptree	Eastern cottonwood, eastern white pine, pin oak
86C2: Osco	Black chokeberry, common winterberry, coralberry, mapleleaf viburnum, silky dogwood	American hazelnut, American plum, blackhaw, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, eastern white pine, pin oak
88B: Sparta	American plum, common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American cranberrybush, American hazelnut, alternateleaf dogwood, nannyberry, prairie crabapple, shadbush, witchhazel	Blue spruce, eastern redcedar, green ash, northern red oak, northern whitecedar	Eastern white pine	---

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
102A:					
La Hogue	Black chokeberry, common winterberry, coralberry, mapleleaf viburnum, silky dogwood	American plum, prairie crabapple, rusty blackhaw, shadbush	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, eastern white pine, pin oak
104A:					
Virgil	Black chokeberry, common winterberry, coralberry, mapleleaf viburnum, silky dogwood	American plum, prairie crabapple, rusty blackhaw, shadbush	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, eastern white pine, pin oak
105B2:					
Batavia	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, eastern white pine, pin oak
119D2:					
Elco	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, eastern white pine, pin oak
119E2:					
Elco	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, eastern white pine, pin oak
134C2:					
Camden	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, eastern white pine, pin oak
134D2:					
Camden	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, eastern white pine, pin oak

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
134E2:					
Camden	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, eastern white pine, pin oak
150B:					
Onarga	American plum, black chokeberry, common winterberry, coralberry, gray dogwood, mapleleaf viburnum	American hazelnut, Arnold hawthorn, Arnold hawthorn, blackhaw, prairie crabapple, shadbush, witchhazel	Baldcypress, eastern redcedar, green ash, northern red oak, northern whitecedar	Norway spruce, eastern white pine, hackberry, pin oak	Eastern cottonwood
198A:					
Elburn	Black chokeberry, common winterberry, coralberry, mapleleaf viburnum, silky dogwood	American plum, prairie crabapple, rusty blackhaw, shadbush	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern white pine, pin oak, eastern cottonwood
199B:					
Plano	Black chokeberry, common winterberry, coralberry, mapleleaf viburnum, silky dogwood	American plum, prairie crabapple, roughleaf dogwood, rusty blackhaw, shadbush	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Pin oak, eastern cottonwood, eastern white pine
242A:					
Kendall	Black chokeberry, common winterberry, coralberry, mapleleaf viburnum, silky dogwood	American plum, prairie crabapple, rusty blackhaw, shadbush	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern white pine, pin oak, eastern cottonwood
243B:					
St. Charles	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, pin oak, eastern white pine

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
257A:					
Clarksdale	Black chokeberry, common winterberry, coralberry, mapleleaf viburnum, silky dogwood	American plum, prairie crabapple, rusty blackhaw, shadbush	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Pin oak, eastern cottonwood, eastern white pine
259C2:					
Assumption	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, pin oak, eastern white pine
271D2:					
Timula	Common winterberry, coralberry, gray dogwood, redosier dogwood, roughleaf dogwood, silky dogwood	American hazelnut, blackhaw, shadbush, southern arrowwood, witchhazel	Eastern redcedar, green ash, hackberry, nannyberry, northern red oak, northern whitecedar	Norway spruce	Eastern white pine
274E2:					
Seaton	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, pin oak, eastern white pine
274F:					
Seaton	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, pin oak, eastern white pine
274G:					
Seaton	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, pin oak, eastern white pine

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
279B:					
Rozetta	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, eastern white pine, pin oak
279C2:					
Rozetta	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, eastern white pine, pin oak
279C3:					
Rozetta	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, eastern white pine, pin oak
280B2:					
Fayette	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, eastern white pine, pin oak
280C2:					
Fayette	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, eastern white pine, pin oak
280D2:					
Fayette	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, eastern white pine, pin oak
280E2:					
Fayette	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, eastern white pine, pin oak

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
379A:					
Dakota	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf viburnum	American hazelnut, alternateleaf dogwood, eastern redcedar, nannyberry, northern whitecedar, prairie crabapple, shadbush	Eastern white pine, green ash	---	---
379B:					
Dakota	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf viburnum	American hazelnut, alternateleaf dogwood, eastern redcedar, nannyberry, northern whitecedar, prairie crabapple, shadbush	Eastern white pine, green ash	---	---
430B:					
Raddle	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, eastern white pine, pin oak
536:					
Dumps, mine.					
549F:					
Marseilles	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf viburnum	American hazelnut, alternateleaf dogwood, eastern redcedar, nannyberry, northern whitecedar, prairie crabapple, shadbush	Eastern white pine, green ash	---	---

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
549G:					
Marseilles	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf viburnum	American hazelnut, alternateleaf dogwood, eastern redcedar, nannyberry, northern whitecedar, prairie crabapple, shadbush	Eastern white pine, green ash	---	---
558A:					
Breeds	Black chokeberry, common winterberry, coralberry, mapleleaf viburnum, silky dogwood	American plum, prairie crabapple, rusty blackhaw, shadbush	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Pin oak, eastern cottonwood, eastern white pine
567B2:					
Elkhart	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, eastern white pine, pin oak
567C2:					
Elkhart	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, eastern white pine, pin oak
570B:					
Martinsville	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, eastern white pine, pin oak
596B:					
Marbletown	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, eastern white pine, pin oak

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
630C3:					
Navlys	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, eastern white pine, pin oak
632A:					
Copperas	Black chokeberry, coralberry, gray dogwood, mapleleaf viburnum	American plum, blackhaw, nannyberry, prairie crabapple, roughleaf dogwood	Eastern redcedar, hackberry, northern whitecedar, shadbush, witchhazel	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak, tuliptree	Eastern cottonwood, pin oak
675B:					
Greenbush	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, eastern white pine, pin oak
779B:					
Chelsea	American plum, common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American cranberrybush, American hazelnut, alternateleaf dogwood, nannyberry, prairie crabapple, shadbush, witchhazel	Blue spruce, eastern redcedar, green ash, northern red oak, northern whitecedar	Eastern white pine	---
779D:					
Chelsea	American plum, common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American cranberrybush, American hazelnut, alternateleaf dogwood, nannyberry, prairie crabapple, shadbush, witchhazel	Blue spruce, eastern redcedar, green ash, northern red oak, northern whitecedar	Eastern white pine	---

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
801B:					
Orthents	Black chokeberry, common winterberry, coralberry, mapleleaf viburnum, silky dogwood	American plum, prairie crabapple, rusty blackhaw, shadbush	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar, tamarack	Norway spruce, baldcypress, green ash, hackberry	Pin oak, eastern cottonwood
823B:					
Schuline	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, eastern white pine, pin oak
823D:					
Schuline	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, eastern white pine, pin oak
865:					
Pits, gravel.					
871B:					
Lenzburg	American plum, black chokeberry, blackhaw, gray dogwood, mapleleaf viburnum	Cock's-spur hawthorn, eastern redcedar, eastern white pine, nannyberry, prairie crabapple, shadbush	Black locust, thornless honeylocust	---	---
871D:					
Lenzburg	American plum, black chokeberry, blackhaw, gray dogwood, mapleleaf viburnum	Cock's-spur hawthorn, eastern redcedar, eastern white pine, nannyberry, prairie crabapple, shadbush	Black locust, thornless honeylocust	---	---
871G:					
Lenzburg	American plum, black chokeberry, blackhaw, gray dogwood, mapleleaf viburnum	Cock's-spur hawthorn, eastern redcedar, eastern white pine, nannyberry, prairie crabapple, shadbush	Black locust, thornless honeylocust	---	---

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
872B:					
Rapatee	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, eastern white pine, pin oak
876B:					
Lenzwheel	American plum, black chokeberry, blackhaw, gray dogwood, mapleleaf viburnum	Cock's-spur hawthorn, eastern redcedar, eastern white pine, nannyberry, prairie crabapple, shadbush	Black locust, thornless honeylocust	---	---
876D:					
Lenzwheel	American plum, black chokeberry, blackhaw, gray dogwood, mapleleaf viburnum	Cock's-spur hawthorn, eastern redcedar, eastern white pine, nannyberry, prairie crabapple, shadbush	Black locust, thornless honeylocust	---	---
876G:					
Lenzwheel	American plum, black chokeberry, blackhaw, gray dogwood, mapleleaf viburnum	Cock's-spur hawthorn, eastern redcedar, eastern white pine, nannyberry, prairie crabapple, shadbush	Black locust, thornless honeylocust	---	---
3070A:					
Beaucoup	Black chokeberry, coralberry, gray dogwood, mapleleaf viburnum	American plum, blackhaw, nannyberry, prairie crabapple, roughleaf dogwood	Eastern redcedar, hackberry, northern whitecedar, shadbush, witchhazel	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak, tuliptree	Eastern cottonwood, pin oak
3074A:					
Radford	Black chokeberry, common winterberry, coralberry, mapleleaf viburnum, silky dogwood	American plum, prairie crabapple, roughleaf dogwood, rusty blackhaw, shadbush	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern white pine, pin oak, eastern cottonwood

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
3077A: Huntsville	Black chokeberry, common winterberry, coralberry, mapleleaf viburnum, silky dogwood	American plum, prairie crabapple, rusty blackhaw, shadbush	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern white pine, pin oak, eastern cottonwood
3107A: Sawmill	Black chokeberry, coralberry, gray dogwood, mapleleaf viburnum	American plum, blackhaw, nannyberry, prairie crabapple, roughleaf dogwood	Eastern redcedar, hackberry, northern whitecedar, shadbush, tamarack, witchhazel	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak, tuliptree	Eastern cottonwood, pin oak
3284A: Tice	Black chokeberry, common winterberry, coralberry, mapleleaf viburnum, silky dogwood	American plum, prairie crabapple, rusty blackhaw, shadbush	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern white pine, pin oak, eastern cottonwood
3333A: Wakeland	Black chokeberry, common winterberry, coralberry, mapleleaf viburnum, silky dogwood	American plum, prairie crabapple, rusty blackhaw, shadbush	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern white pine, pin oak, eastern cottonwood
3404A: Titus	Black chokeberry, black chokeberry, common winterberry, coralberry, coralberry, gray dogwood, mapleleaf viburnum, mapleleaf viburnum, silky dogwood	American plum, blackhaw, nannyberry, prairie crabapple, roughleaf dogwood	Eastern redcedar, hackberry, northern whitecedar, shadbush, witchhazel	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak, tuliptree	Eastern cottonwood, pin oak
3415A: Orion	Black chokeberry, common winterberry, coralberry, mapleleaf viburnum, silky dogwood	American plum, prairie crabapple, rusty blackhaw, shadbush	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern white pine, pin oak, eastern cottonwood

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
3451A:					
Lawson	Black chokeberry, common winterberry, coralberry, mapleleaf viburnum, silky dogwood	American plum, prairie crabapple, rusty blackhaw, shadbush	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern white pine, pin oak, eastern cottonwood
3634A:					
Blyton	Black chokeberry, common winterberry, coralberry, mapleleaf viburnum, silky dogwood	American plum, prairie crabapple, rusty blackhaw, shadbush	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern white pine, pin oak, eastern cottonwood
3641L:					
Quiver	Black chokeberry, coralberry, gray dogwood, mapleleaf viburnum	American plum, blackhaw, nannyberry, prairie crabapple, roughleaf dogwood	Eastern redcedar, hackberry, northern whitecedar, shadbush, witchhazel	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak, tuliptree	Eastern cottonwood, pin oak
7081A:					
Littleton	Black chokeberry, common winterberry, coralberry, mapleleaf viburnum, silky dogwood	American plum, prairie crabapple, rusty blackhaw, shadbush	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern white pine, pin oak, eastern cottonwood
8070A:					
Beaucoup	Black chokeberry, coralberry, gray dogwood, mapleleaf viburnum	American plum, blackhaw, nannyberry, prairie crabapple, roughleaf dogwood	Eastern redcedar, hackberry, northern whitecedar, shadbush, witchhazel	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak, tuliptree	Eastern cottonwood, pin oak
8092B:					
Sarpy	Coralberry, mapleleaf viburnum, redosier dogwood	Blackhaw, downy arrowwood, rusty blackhaw, shadbush, southern arrowwood	Eastern redcedar, green ash, hackberry, nannyberry, northern red oak, northern whitecedar	---	---

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
8183A: Shaffton	Black chokeberry, common winterberry, coralberry, mapleleaf viburnum, silky dogwood	American plum, prairie crabapple, rusty blackhaw, shadbush	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern white pine, pin oak, eastern cottonwood
8284A: Tice	Black chokeberry, common winterberry, coralberry, mapleleaf viburnum, silky dogwood	American plum, prairie crabapple, rusty blackhaw, shadbush	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern white pine, pin oak, eastern cottonwood
8302A: Ambraw	Black chokeberry, coralberry, gray dogwood, mapleleaf viburnum	American plum, blackhaw, nannyberry, prairie crabapple, roughleaf dogwood	Eastern redcedar, hackberry, northern whitecedar, shadbush, witchhazel	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak, tuliptree	Eastern cottonwood, pin oak
8404A: Titus	Black chokeberry, coralberry, gray dogwood, mapleleaf viburnum	American plum, blackhaw, nannyberry, prairie crabapple, roughleaf dogwood	Eastern redcedar, hackberry, northern whitecedar, shadbush, witchhazel	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak, tuliptree	Eastern cottonwood, pin oak
8415A: Orion	Black chokeberry, common winterberry, coralberry, mapleleaf viburnum, silky dogwood	American plum, prairie crabapple, rusty blackhaw, shadbush	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern white pine, pin oak, eastern cottonwood
8595A: Coot	Black chokeberry, common winterberry, coralberry, mapleleaf viburnum, silky dogwood	American plum, prairie crabapple, rusty blackhaw, shadbush	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern white pine, pin oak, eastern cottonwood

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
8608A: Mudhen	Black chokeberry, coralberry, gray dogwood, mapleleaf viburnum	American plum, blackhaw, nannyberry, prairie crabapple, roughleaf dogwood	Eastern redcedar, hackberry, northern whitecedar, shadbush, witchhazel	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak, tuliptree	Eastern cottonwood, pin oak
8611A: Sepo	Black chokeberry, coralberry, gray dogwood, mapleleaf viburnum	American plum, blackhaw, nannyberry, prairie crabapple, roughleaf dogwood	Eastern redcedar, hackberry, northern whitecedar, shadbush, witchhazel	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak, tuliptree	Eastern cottonwood, pin oak
8875B: Lenzlo	American plum, black chokeberry, blackhaw, gray dogwood, mapleleaf viburnum	Cock's-spur hawthorn, eastern redcedar, eastern white pine, nannyberry, prairie crabapple, shadbush	Black locust, thornless honeylocust	---	---
9017A: Keomah	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, eastern white pine, pin oak
9068A: Sable	Black chokeberry, coralberry, gray dogwood, mapleleaf viburnum	American plum, blackhaw, nannyberry, prairie crabapple, roughleaf dogwood	Eastern redcedar, hackberry, northern whitecedar, shadbush, witchhazel	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak, tuliptree	Eastern cottonwood, pin oak
9257A: Clarksdale	Black chokeberry, common winterberry, coralberry, mapleleaf viburnum, silky dogwood	American plum, prairie crabapple, rusty blackhaw, shadbush	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern white pine, pin oak, eastern cottonwood

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
9279B:					
Rozetta	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, eastern white pine, pin oak
9279C:					
Rozetta	Common winterberry, coralberry, gray dogwood, mapleleaf viburnum, redosier dogwood	American hazelnut, American plum, blackhaw, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, northern whitecedar, shadbush	Norway spruce, baldcypress, green ash, hackberry, tuliptree	Eastern cottonwood, eastern white pine, pin oak

Table 11.--Forestland Management and Productivity

(Only the soils suitable for production of commercial trees are listed)

Map symbol and soil name	Ordi-nation symbol	Management concerns: Erosion hazard	Equip-ment limita-tion	Seedling mortal-ity	Wind-throw hazard	Plant competi-tion	Potential productivity: Common trees	Site index	Volume of wood fiber*	Suggested trees to plant
7C3:										
Atlas	4C	Slight	Slight	Moderate	Moderate	Slight	Bur oak	70	57	Green ash, hickory, pin oak, eastern redcedar.
							Green ash	70	57	
							Northern red oak	---	---	
							White oak	---	---	
7D3:										
Atlas	4C	Slight	Slight	Moderate	Moderate	Slight	Bur oak	70	57	Green ash, hickory, pin oak, eastern redcedar.
							Green ash	70	57	
							Northern red oak	---	---	
							White oak	---	---	
8D2:										
Hickory	5A	Slight	Slight	Slight	Slight	Moderate	Northern red oak	85	72	White oak, northern red oak, pecan, black walnut, green ash, baldcypress.
							White oak	85	72	
							Black oak	---	---	
							Green ash	---	---	
							Bitternut hickory	---	---	
							Tuliptree	---	---	
8E2:										
Hickory	5R	Moderate	Moderate	Slight	Slight	Moderate	Northern red oak	85	72	White oak, northern red oak, pecan, green ash, baldcypress.
							White oak	85	72	
							Green ash	---	---	
							Sweetgum	---	---	
							Tuliptree	---	---	
8F:										
Hickory	5R	Severe	Severe	Slight	Slight	Moderate	Northern red oak	85	72	White oak, northern red oak, pecan, green ash, baldcypress.
							White oak	85	72	
							Green ash	---	---	
							Sweetgum	---	---	
							Baldcypress	---	---	
							Tuliptree	---	---	
8G:										
Hickory	5R	Severe	Severe	Slight	Slight	Moderate	Northern red oak	85	72	White oak, northern red oak, pecan, green ash, baldcypress.
							White oak	85	72	
							Green ash	---	---	
							Sweetgum	---	---	
							Tuliptree	---	---	
17A:										
Keomah	3A	Slight	Slight	Slight	Slight	Moderate	Northern red oak	85	72	White oak, northern red oak, pecan, black walnut, green ash, baldcypress.
							White oak	85	72	
17B:										
Keomah	3A	Slight	Slight	Slight	Slight	Moderate	Northern red oak	85	72	White oak, northern red oak, pecan, black walnut, green ash, baldcypress.
							White oak	85	72	

See footnote at end of table.

Table 11.--Forestland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume of wood fiber*	Suggested trees to plant
19D3:										
Sylvan	6A	Slight	Slight	Slight	Slight	Moderate	Northern red oak	85	72	White oak, northern red oak, pecan, black walnut, green ash, baldcypress.
							White oak	85	72	
							Black walnut	---	---	
							Tuliptree	---	---	
75B:										
Drury	7A	Slight	Slight	Slight	Slight	Moderate	Northern red oak	85	72	White oak, northern red oak, pecan, black walnut, green ash, baldcypress.
							White oak	85	72	
							Green ash	---	---	
							Sweetgum	---	---	
							Tuliptree	---	---	
75C2:										
Drury	7A	Slight	Slight	Slight	Slight	Moderate	Northern red oak	85	72	White oak, northern red oak, pecan, black walnut, green ash, baldcypress.
							White oak	85	72	
							Green ash	---	---	
							Sweetgum	---	---	
							Tuliptree	---	---	
88B:										
Sparta	4S	Slight	Slight	Severe	Slight	Slight	Northern red oak	70	57	Black oak, eastern redcedar, black locust, eastern white pine.
							Eastern white pine	---	---	
							Red pine	---	---	
							Jack pine	---	---	
104A:										
Virgil	4A	Slight	Slight	Slight	Slight	Moderate	Northern red oak	85	72	White oak, northern red oak, pecan, black walnut, green ash, baldcypress.
							White oak	85	72	
							Black walnut	---	---	
105B2:										
Batavia	4A	Slight	Slight	Slight	Slight	Moderate	Northern red oak	85	72	White oak, northern red oak, pecan, black walnut, green ash, baldcypress.
							White oak	85	72	
							Black walnut	---	---	
119D2:										
Elco	4A	Slight	Slight	Slight	Slight	Moderate	Northern red oak	85	72	White oak, northern red oak, pecan, black walnut, green ash, baldcypress.
							White oak	85	72	
							Black walnut	---	---	
119E2:										
Elco	4R	Moderate	Moderate	Moderate	Slight	Moderate	Northern red oak	85	72	White oak, northern red oak, pecan, green ash, baldcypress.
							White oak	85	72	
							Black walnut	---	---	

See footnote at end of table.

Table 11.--Forestland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Volume of wood fiber*	Suggested trees to plant
134C2:										
Camden----------	7A	Slight	Slight	Slight	Slight	Severe	Northern red oak----	85	72	White oak, northern red oak, pecan, black walnut, green ash, baldcypress.
							White oak-----------	85	72	
							Green ash-----------	76	72	
							Sweetgum------------	80	86	
							Tuliptree-----------	95	100	
134D2:										
Camden----------	7R	Moderate	Moderate	Slight	Slight	Severe	Northern red oak----	85	72	White oak, northern red oak, pecan, black walnut, green ash, baldcypress.
							White oak-----------	85	72	
							Green ash-----------	76	72	
							Sweetgum------------	80	86	
							Tuliptree-----------	95	100	
134E2:										
Camden----------	7R	Moderate	Moderate	Slight	Slight	Severe	Northern red oak----	85	72	White oak, northern red oak, pecan, green ash, baldcypress.
							White oak-----------	85	72	
							Green ash-----------	76	72	
							Sweetgum------------	80	86	
							Tuliptree-----------	95	100	
242A:										
Kendall---------	4A	Slight	Slight	Slight	Slight	Moderate	Northern red oak----	80	57	White oak, northern red oak, pecan, black walnut, green ash, baldcypress.
							White oak-----------	80	57	
							Black walnut--------	---	---	
							Tuliptree-----------	90	86	
243B:										
St. Charles-----	7A	Slight	Slight	Slight	Slight	Severe	Northern red oak----	85	72	White oak, northern red oak, pecan, black walnut, green ash, baldcypress.
							White oak-----------	85	72	
							Green ash-----------	---	---	
							Sweetgum------------	---	---	
							Tuliptree-----------	95	100	
257A:										
Clarksdale------	4A	Slight	Slight	Slight	Slight	Moderate	Northern red oak----	80	57	White oak, northern red oak, pecan, black walnut, green ash, baldcypress.
							White oak-----------	80	57	
							Black walnut--------	---	---	
							Tuliptree-----------	90	86	
271D2:										
Timula----------	4A	Slight	Slight	Slight	Slight	Moderate	White oak-----------	70	57	Scotch pine, eastern white pine, red pine, white oak.
							Northern red oak----	---	---	
							Bur oak-------------	---	---	
							Green ash-----------	---	---	
274E2:										
Seaton----------	6R	Moderate	Moderate	Moderate	Slight	Moderate	Northern red oak----	80	57	White oak, northern red oak, pecan, green ash, baldcypress.
							White oak-----------	90	72	
							Black walnut--------	---	---	
							Tuliptree-----------	90	86	

See footnote at end of table.

Table 11.--Forestland Management and Productivity--Continued

Map symbol and soil name	Ordi-nation symbol	Management concerns: Erosion hazard	Management concerns: Equip-ment limita-tion	Management concerns: Seedling mortal-ity	Management concerns: Wind-throw hazard	Management concerns: Plant competi-tion	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume of wood fiber*	Suggested trees to plant
274F:										
Seaton---------	6R	Moderate	Moderate	Moderate	Slight	Moderate	Northern red oak----	80	57	White oak,
							White oak-----------	90	72	northern red
							Black walnut--------	---	---	oak, pecan,
							Tuliptree-----------	90	86	green ash,
										baldcypress.
274G:										
Seaton---------	6R	Severe	Severe	Severe	Slight	Moderate	Northern red oak----	80	57	White oak,
							White oak-----------	90	72	northern red
							Black walnut--------	---	---	oak, pecan,
							Tuliptree-----------	90	86	green ash,
										baldcypress.
279B:										
Rozetta--------	4A	Slight	Slight	Slight	Slight	Moderate	Northern red oak----	80	57	White oak,
							White oak-----------	80	57	northern red
							Black walnut--------	---	---	oak, pecan,
							Tuliptree-----------	90	86	black walnut,
										green ash,
										baldcypress.
279C2:										
Rozetta--------	4A	Slight	Slight	Slight	Slight	Moderate	Northern red oak----	80	57	White oak,
							White oak-----------	80	57	northern red
							Black walnut--------	---	---	oak, pecan,
							Tuliptree-----------	90	86	black walnut,
										green ash,
										baldcypress.
279C3:										
Rozetta--------	4A	Slight	Slight	Slight	Slight	Moderate	Northern red oak----	80	57	White oak,
							White oak-----------	80	57	northern red
							Black walnut--------	---	---	oak, pecan,
							Tuliptree-----------	90	86	black walnut,
										green ash,
										baldcypress.
280B2:										
Fayette--------	4A	Slight	Slight	Slight	Slight	Moderate	Northern red oak----	80	57	White oak,
							White oak-----------	80	57	northern red
							Black walnut--------	---	---	oak, pecan,
							Tuliptree-----------	90	86	black walnut,
										green ash,
										baldcypress.
280C2:										
Fayette--------	4A	Slight	Slight	Slight	Slight	Moderate	Northern red oak----	80	57	White oak,
							White oak-----------	80	57	northern red
							Black walnut--------	---	---	oak, pecan,
							Tuliptree-----------	90	86	black walnut,
										green ash,
										baldcypress.
280D2:										
Fayette--------	4A	Slight	Slight	Slight	Slight	Moderate	Northern red oak----	80	57	White oak,
							White oak-----------	80	57	northern red
							Black walnut--------	---	---	oak, pecan,
							Tuliptree-----------	90	86	black walnut,
										green ash,
										baldcypress.

See footnote at end of table.

Table 11.--Forestland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Volume of wood fiber*	Suggested trees to plant
280E2:										
Fayette	4R	Moderate	Moderate	Slight	Slight	Moderate	Northern red oak	80	57	White oak, northern red oak, pecan, green ash, baldcypress.
							White oak	80	57	
							Black walnut	---	---	
							Tuliptree	90	86	
549F:										
Marseilles	3R	Moderate	Moderate	Slight	Slight	Slight	Northern red oak	66	43	Green ash, eastern redcedar, black locust, eastern white pine.
							White oak	66	43	
							Black oak	---	---	
							White ash	---	---	
549G:										
Marseilles	3R	Severe	Severe	Slight	Slight	Slight	Northern red oak	66	43	Green ash, eastern redcedar, black locust, eastern white pine.
							White oak	66	43	
							Black oak	---	---	
							White ash	---	---	
570B:										
Martinsville	4A	Slight	Slight	Slight	Slight	Severe	White oak	80	57	White oak, northern red oak, pecan, black walnut, green ash, baldcypress.
							Sweetgum	76	72	
							Tuliptree	98	100	
630C3:										
Navlys	4A	Slight	Slight	Slight	Slight	Moderate	White oak	85	72	White oak, northern red oak, pecan, black walnut, green ash, baldcypress.
							Northern red oak	85	72	
							Green ash	---	---	
							Black walnut	---	---	
							Cherrybark oak	95	100	
							Pecan	---	---	
							Baldcypress	---	---	
675B:										
Greenbush	4A	Slight	Slight	Slight	Slight	Moderate	Northern red oak	80	57	White oak, northern red oak, pecan, black walnut, green ash, baldcypress.
							White oak	80	57	
							Tuliptree	90	86	
							Black walnut	---	---	
779B:										
Chelsea	3S	Slight	Slight	Moderate	Slight	Slight	White oak	55	43	Black oak, eastern redcedar, black locust, eastern white pine.

See footnote at end of table.

Table 11.--Forestland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume of wood fiber*	Suggested trees to plant
779D:										
Chelsea	3S	Slight	Slight	Moderate	Slight	Slight	White oak	55	43	Black oak, eastern redcedar, black locust, eastern white pine.
871B:										
Lenzburg	5A	Slight	Slight	Slight	Slight	Moderate	Black walnut	73	70	Green ash, eastern redcedar, black locust, eastern white pine.
							Sweetgum	76	72	
							Eastern cottonwood	---	---	
871D:										
Lenzburg	5A	Slight	Slight	Slight	Slight	Moderate	Black walnut	73	70	Green ash, eastern redcedar, black locust, eastern white pine.
							Sweetgum	76	72	
							Eastern cottonwood	---	---	
871G:										
Lenzburg	5R	Severe	Severe	Slight	Slight	Moderate	Black walnut	73	70	Green ash, eastern redcedar, black locust, eastern white pine.
							Sweetgum	76	72	
							Eastern cottonwood	---	---	
876B:										
Lenzwheel	5A	Slight	Slight	Slight	Slight	Moderate	Silver maple	---	---	Green ash, eastern redcedar, black locust, eastern white pine.
							Eastern cottonwood	---	---	
							Sweetgum	76	72	
876D:										
Lenzwheel	5A	Slight	Slight	Slight	Slight	Moderate	Eastern cottonwood	---	---	Green ash, eastern redcedar, black locust, eastern white pine.
							Silver maple	---	---	
							Sweetgum	76	72	
876G:										
Lenzwheel	5R	Severe	Severe	Slight	Slight	Moderate	Eastern cottonwood	---	---	Green ash, eastern redcedar, black locust, eastern white pine.
							Silver maple	---	---	
							Sweetgum	76	72	
3070A:										
Beaucoup	5W	Slight	Severe	Moderate	Moderate	Severe	American sycamore	---	---	Green ash, swamp white oak, bur oak, pin oak, baldcypress.
							Cherrybark oak	---	---	
							Eastern cottonwood	110	157	
							Pin oak	---	---	
							Sweetgum	---	---	

See footnote at end of table.

Table 11.--Forestland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Volume of wood fiber*	Suggested trees to plant
3077A:										
Huntsville	7A	Slight	Slight	Slight	Slight	Moderate	Tuliptree	98	100	White oak,
							Eastern cottonwood	110	157	northern red
							Green ash	---	---	oak, pecan,
							Sweetgum	---	---	black walnut,
							American sycamore	---	---	green ash,
							Cherrybark oak	---	---	baldcypress.
3107A:										
Sawmill	5W	Slight	Moderate	Moderate	Moderate	Severe	Pin oak	90	72	Green ash,
							Cherrybark oak	---	---	swamp white
							Sweetgum	---	---	oak, bur oak,
							American sycamore	---	---	pin oak,
							Eastern cottonwood	---	---	baldcypress.
3284A:										
Tice	5A	Slight	Slight	Slight	Slight	Severe	Virginia pine	90	90	White oak,
							Eastern cottonwood	---	---	northern red
							Pin oak	96	78	oak, pecan,
							Sweetgum	86	95	black walnut,
							Tuliptree	---	---	green ash,
							White ash	---	---	baldcypress.
3333A:										
Wakeland	5A	Slight	Severe	Slight	Moderate	Severe	Pin oak	90	72	White oak,
							Sweetgum	88	100	northern red
							Tuliptree	90	86	oak, pecan,
							Virginia pine	85	129	green ash,
										baldcypress.
3404A:										
Titus	2W	Slight	Severe	Severe	Moderate	Severe	Silver maple	80	29	Green ash,
							White ash	51	29	swamp white
							Eastern cottonwood	99	129	oak, bur oak,
										pin oak,
										baldcypress.
3415A:										
Orion	2W	Slight	Moderate	Slight	Slight	Severe	Silver maple	80	29	White oak,
							Red maple	---	---	northern red
							White ash	---	---	oak, pecan,
										green ash,
										baldcypress.
3451A:										
Lawson	2W	Slight	Moderate	Slight	Slight	Severe	Silver maple	70	29	White oak,
							Red maple	---	---	northern red
							White ash	---	---	oak, pecan,
										black walnut,
										green ash,
										baldcypress.
3634A:										
Blyton	8A	Slight	Moderate	Slight	Slight	Severe	Tuliptree	100	114	White oak,
										northern red
										oak, pecan,
										black walnut,
										green ash,
										baldcypress.

See footnote at end of table.

Table 11.--Forestland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume of wood fiber*	Suggested trees to plant
3641L:										
Quiver	5W	Slight	Severe	Moderate	Moderate	Severe	American sycamore	---	---	Green ash, swamp white oak, bur oak, pin oak, baldcypress.
							Eastern cottonwood	100	128	
							Pin oak	90	72	
							Silver maple	---	---	
8070A:										
Beaucoup	5W	Slight	Severe	Moderate	Moderate	Severe	American sycamore	---	---	Green ash, swamp white oak, bur oak, pin oak, baldcypress.
							Cherrybark oak	---	---	
							Eastern cottonwood	100	128	
							Pin oak	90	72	
							Sweetgum	---	---	
8092B:										
Sarpy	3S	Slight	Slight	Severe	Slight	Slight	Silver maple	90	43	Black oak, eastern redcedar, black locust, eastern white pine.
							Eastern cottonwood	95	114	
8284A:										
Tice	5A	Slight	Slight	Slight	Slight	Severe	Virginia pine	90	135	White oak, northern red oak, pecan, black walnut, green ash, baldcypress.
							Eastern cottonwood	---	---	
							Pin oak	96	78	
							Sweetgum	---	---	
							Tuliptree	---	---	
							White ash	---	---	
8404A:										
Titus	2W	Slight	Severe	Severe	Moderate	Severe	Eastern cottonwood	99	129	Green ash, swamp white oak, bur oak, pin oak, baldcypress.
							Silver maple	80	29	
							White ash	29	29	
8415A:										
Orion	2W	Slight	Moderate	Slight	Slight	Severe	Silver maple	80	29	White oak, northern red oak, pecan, green ash, baldcypress.
							Red maple	---	---	
							White ash	---	---	
8875B:										
Lenzlo	5A	Slight	Slight	Slight	Slight	Moderate	Eastern cottonwood	---	---	Green ash, eastern redcedar, black locust, eastern white pine.
							Silver maple	---	---	
							Pin oak	90	72	
9017A:										
Keomah	3A	Slight	Slight	Slight	Slight	Moderate	Northern red oak	70	57	White oak, northern red oak, pecan, black walnut, green ash, baldcypress.
							White oak	65	43	

See footnote at end of table.

Table 11.--Forestland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Volume of wood fiber*	Suggested trees to plant
9257A:										
Clarksdale-----	4A	Slight	Slight	Slight	Slight	Moderate	Northern red oak----	80	57	White oak, northern red oak, pecan, black walnut, green ash, baldcypress.
							White oak-----------	80	57	
							Tuliptree-----------	90	86	
							Black walnut--------	---	---	
9279B:										
Rozetta--------	4A	Slight	Slight	Slight	Slight	Moderate	Northern red oak----	80	57	White oak, northern red oak, pecan, black walnut, green ash, baldcypress.
							White oak-----------	80	57	
							Tuliptree-----------	90	86	
							Black walnut--------	---	---	
9279C:										
Rozetta--------	4A	Slight	Slight	Slight	Slight	Moderate	Northern red oak----	80	57	White oak, northern red oak, pecan, black walnut, green ash, baldcypress.
							White oak-----------	80	57	
							Tuliptree-----------	90	86	
							Black walnut--------	---	---	

* Volume of wood fiber is the yield in cubic feet per acre per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

Table 12.--Recreational Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
7C3:					
Atlas	Severe: percs slowly, wetness.	Severe: percs slowly.	Severe: percs slowly, slope, wetness.	Severe: erodes easily.	Moderate: wetness, droughty.
7D3:					
Atlas	Severe: percs slowly, wetness.	Severe: percs slowly.	Severe: percs slowly, slope, wetness.	Severe: erodes easily.	Moderate: slope, wetness, droughty.
8D2:					
Hickory	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
8E2:					
Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
8F:					
Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily, slope.	Severe: slope.
8G:					
Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily, slope.	Severe: slope.
16A:					
Rushville	Severe: percs slowly, ponding.	Severe: percs slowly, ponding.	Severe: percs slowly, ponding.	Severe: ponding.	Severe: ponding.
17A:					
Keomah	Severe: wetness.	Moderate: percs slowly, wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
17B:					
Keomah	Severe: wetness.	Moderate: percs slowly, wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
19D3:					
Sylvan	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
37B:					
Worthen	Slight	Slight	Moderate: slope.	Slight	Slight.
43A:					
Ipava	Severe: wetness.	Moderate: percs slowly, wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
45A:					
Denny	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
68A:					
Sable	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
75B:					
Drury	Slight	Slight	Moderate: slope.	Severe: erodes easily.	Slight.
75C2:					
Drury	Slight	Slight	Severe: slope.	Severe: erodes easily.	Slight.
86B:					
Osco	Slight	Slight	Moderate: slope.	Slight	Slight.
86C2:					
Osco	Slight	Slight	Severe: slope.	Slight	Slight.
88B:					
Sparta	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, small stones.	Moderate: too sandy.	Moderate: droughty.
102A:					
La Hogue	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
104A:					
Virgil	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
105B2:					
Batavia	Slight	Slight	Moderate: slope.	Slight	Slight.
119D2:					
Elco	Moderate: percs slowly, slope.	Moderate: percs slowly, slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
119E2:					
Elco	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
134C2:					
Camden	Slight	Slight	Severe: slope.	Slight	Slight.
134D2:					
Camden	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
134E2:					
Camden	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
150B: Onarga	Slight	Slight	Moderate: slope.	Slight	Slight.
198A: Elburn	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
199B: Plano	Slight	Slight	Moderate: slope.	Slight	Slight.
242A: Kendall	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
243B: St. Charles	Slight	Slight	Moderate: slope.	Severe: erodes easily.	Slight.
257A: Clarksdale	Severe: wetness.	Moderate: percs slowly, wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
259C2: Assumption	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Slight	Slight.
271D2: Timula	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
274E2: Seaton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
274F: Seaton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily, slope.	Severe: slope.
274G: Seaton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily, slope.	Severe: slope.
279B: Rozetta	Slight	Slight	Moderate: slope.	Slight	Slight.
279C2: Rozetta	Slight	Slight	Severe: slope.	Slight	Slight.
279C3: Rozetta	Slight	Slight	Severe: slope.	Slight	Slight.
280B2: Fayette	Slight	Slight	Moderate: slope.	Severe: erodes easily.	Slight.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
280C2: Fayette	Slight	Slight	Severe: slope.	Severe: erodes easily.	Slight.
280D2: Fayette	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
280E2: Fayette	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
379A: Dakota	Slight	Slight	Moderate: small stones.	Slight	Slight.
379B: Dakota	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
430B: Raddle	Slight	Moderate: slope.	Slight	Slight	Slight.
536: Dumps, mine.					
549F: Marseilles	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily, slope.	Severe: slope.
549G: Marseilles	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily, slope.	Severe: slope.
558A: Breeds	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
567B2: Elkhart	Slight	Slight	Moderate: slope.	Slight	Slight.
567C2: Elkhart	Slight	Slight	Severe: slope.	Slight	Slight.
570B: Martinsville	Slight	Slight	Moderate: slope, small stones.	Severe: erodes easily.	Slight.
596B: Marbletown	Slight	Slight	Moderate: slope.	Slight	Slight.
630C3: Navlys	Slight	Slight	Severe: slope.	Severe: erodes easily.	Slight.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
632A:					
Copperas	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
675B:					
Greenbush	Slight	Slight	Moderate: slope.	Slight	Slight.
779B:					
Chelsea	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Moderate: droughty.
779D:					
Chelsea	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.	Moderate: slope, droughty.
801B:					
Orthents	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: percs slowly, slope.	Severe: erodes easily.	Slight.
823B:					
Schuline	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones.	Severe: erodes easily.	Slight.
823D:					
Schuline	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Severe: erodes easily.	Slight.
865:					
Pits, gravel.					
871B:					
Lenzburg	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: percs slowly, slope, small stones.	Severe: erodes easily.	Moderate: large stones.
871D:					
Lenzburg	Moderate: percs slowly, slope.	Moderate: percs slowly, slope.	Severe: slope.	Severe: erodes easily.	Moderate: large stones, slope.
871G:					
Lenzburg	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily, slope.	Severe: slope.
872B:					
Rapatee	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: percs slowly, slope.	Slight	Slight.
876B:					
Lenzwheel	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: percs slowly, slope.	Severe: erodes easily.	Moderate: droughty.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
876D:					
Lenzwheel	Moderate: percs slowly, slope.	Moderate: percs slowly, slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope, droughty.
876G:					
Lenzwheel	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily, slope.	Severe: slope.
3070A:					
Beaucoup	Severe: flooding, ponding.	Severe: ponding.	Severe: flooding, ponding.	Severe: ponding.	Severe: flooding, ponding.
3074A:					
Radford	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: flooding.
3077A:					
Huntsville	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
3107A:					
Sawmill	Severe: flooding, wetness.	Severe: wetness.	Severe: flooding, wetness.	Severe: wetness.	Severe: flooding, wetness.
3284A:					
Tice	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: flooding.
3333A:					
Wakeland	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: flooding, wetness.
3404A:					
Titus	Severe: flooding, too clayey, ponding.	Severe: too clayey, ponding.	Severe: flooding, too clayey, ponding.	Severe: too clayey, ponding.	Severe: flooding, too clayey, ponding.
3415A:					
Orion	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: flooding.
3451A:					
Lawson	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: flooding.
3634A:					
Blyton	Severe: flooding.	Moderate: flooding, wetness.	Severe: flooding.	Moderate: flooding, wetness.	Severe: flooding.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
3641L: Quiver	Severe: flooding, ponding.	Severe: ponding.	Severe: flooding, ponding.	Severe: ponding.	Severe: flooding, ponding.
7081A: Littleton	Severe: flooding, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
8070A: Beaucoup	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
8092B: Sarpy	Severe: flooding, too sandy.	Severe: too sandy.	Severe: flooding, too sandy.	Severe: too sandy.	Severe: flooding.
8183A: Shaffton	Severe: flooding.	Moderate: wetness.	Moderate: flooding, wetness.	Slight	Moderate: flooding.
8284A: Tice	Severe: flooding, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: flooding, wetness.
8302A: Ambraw	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
8404A: Titus	Severe: flooding, too clayey, ponding.	Severe: too clayey, ponding.	Severe: too clayey, ponding.	Severe: too clayey, ponding.	Severe: too clayey, ponding.
8415A: Orion	Severe: flooding, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: flooding, wetness.
8595A: Coot	Severe: flooding, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: flooding, wetness.
8608A: Mudhen	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
8611A: Sepo	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
8875B:					
Lenzlo	Severe: flooding, wetness.	Moderate: percs slowly, wetness.	Severe: wetness.	Moderate: wetness.	Moderate: flooding, large stones, wetness.
9017A:					
Keomah	Severe: wetness.	Moderate: percs slowly, wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
9068A:					
Sable	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
9257A:					
Clarksdale	Severe: wetness.	Moderate: percs slowly, wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
9279B:					
Rozetta	Slight	Slight	Moderate: slope.	Slight	Slight.
9279C:					
Rozetta	Slight	Slight	Severe: slope.	Slight	Slight.

Table 13.--Wildlife Habitat

(See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
7C3:										
Atlas	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
7D3:										
Atlas	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
8D2:										
Hickory	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
8E2:										
Hickory	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
8F:										
Hickory	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
8G:										
Hickory	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
16A:										
Rushville	Poor	Fair	Poor	Fair	Fair	Good	Good	Poor	Fair	Good
17A:										
Keomah	Good	Good	Fair	Fair	Fair	Fair	Fair	Good	Fair	Fair
17B:										
Keomah	Good	Good	Fair	Fair	Fair	Fair	Fair	Good	Fair	Fair
19D3:										
Sylvan	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
37B:										
Worthen	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
43A:										
Ipava	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
45A:										
Denny	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good
68A:										
Sable	Fair	Good	Good	Fair	Fair	Good	Good	Good	Fair	Good
75B:										
Drury	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
75C2:										
Drury	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

Table 13.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
86B:										
Osco	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
86C2:										
Osco	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
88B:										
Sparta	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
102A:										
La Hogue	Good	Good	Good	Good	Fair	Fair	Poor	Good	Good	Poor
104A:										
Virgil	Good	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor
105B2:										
Batavia	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
119D2:										
Elco	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
119E2:										
Elco	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
134C2:										
Camden	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Poor
134D2:										
Camden	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Poor
134E2:										
Camden	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Poor
150B:										
Onarga	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
198A:										
Elburn	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
199B:										
Plano	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
242A:										
Kendall	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
243B:										
St. Charles	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
257A:										
Clarksdale	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
259C2:										
Assumption	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

Table 13.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
271D2: Timula	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
274E2: Seaton	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
274F: Seaton	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
274G: Seaton	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
279B: Rozetta	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
279C2: Rozetta	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
279C3: Rozetta	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
280B2: Fayette	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
280C2: Fayette	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
280D2: Fayette	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
280E2: Fayette	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
379A: Dakota	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
379B: Dakota	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
430B: Raddle	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
536: Dumps, mine.										
549F: Marseilles	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.

Table 13.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
549G:										
Marseilles	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
558A:										
Breeds	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
567B2:										
Elkhart	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
567C2:										
Elkhart	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
570B:										
Martinsville	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
596B:										
Marbletown	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
630C3:										
Navlys	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
632A:										
Copperas	Good	Good	Good	Fair	Fair	Good	Good	Good	Fair	Good
675B:										
Greenbush	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
779B:										
Chelsea	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
779D:										
Chelsea	Very poor.	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
801B:										
Orthents	Good	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor
823B:										
Schuline	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
823D:										
Schuline	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
865:										
Pits, gravel.										
871B:										
Lenzburg	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
871D:										
Lenzburg	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

Table 13.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
871G:										
Lenzburg	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
872B:										
Rapatee	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
876B:										
Lenzwheel	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
876D:										
Lenzwheel	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
876G:										
Lenzwheel	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
3070A:										
Beaucoup	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good
3074A:										
Radford	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
3077A:										
Huntsville	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
3107A:										
Sawmill	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good
3284A:										
Tice	Poor	Fair	Fair	Good	Good	Fair	Fair	Fair	Good	Fair
3333A:										
Wakeland	Poor	Fair	Fair	Good	Good	Fair	Fair	Fair	Good	Fair
3404A:										
Titus	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good
3415A:										
Orion	Good	Good	Good	Good	Good	Good	Fair	Good	Good	Good
3451A:										
Lawson	Good	Good	Fair	Good	Good	Fair	Fair	Good	Good	Fair
3634A:										
Blyton	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
3641L:										
Quiver	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good
7081A:										
Littleton	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
8070A:										
Beaucoup	Good	Good	Good	Fair	Fair	Good	Good	Good	Fair	Good
8092B:										
Sarpy	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.

Table 13.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
8183A:										
Shaffton	Good	Good	Good	Good	Fair	Good	Good	Good	Good	Good
8284A:										
Tice	Poor	Fair	Fair	Good	Good	Fair	Fair	Fair	Good	Fair
8302A:										
Ambraw	Good	Fair	Good	Good	Fair	Good	Good	Good	Good	Good
8404A:										
Titus	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good
8415A:										
Orion	Good	Good	Good	Good	Good	Good	Fair	Good	Good	Good
8595A:										
Coot	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
8608A:										
Mudhen	Good	Good	Good	Fair	Fair	Good	Good	Good	Fair	Good
8611A:										
Sepo	Fair	Fair	Fair	Good	Fair	Good	Good	Fair	Fair	Good
8875B:										
Lenzlo	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
9017A:										
Keomah	Good	Good	Fair	Fair	Fair	Fair	Fair	Good	Fair	Fair
9068A:										
Sable	Fair	Good	Good	Fair	Fair	Good	Good	Good	Fair	Good
9257A:										
Clarksdale	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
9279B:										
Rozetta	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
9279C:										
Rozetta	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

Table 14.--Building Site Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
7C3:						
Atlas	Severe: wetness.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: low strength, shrink-swell.	Moderate: wetness, droughty.
7D3:						
Atlas	Severe: wetness.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: shrink-swell, slope, wetness.	Severe: low strength, shrink-swell.	Moderate: slope, wetness, droughty.
8D2:						
Hickory	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
8E2:						
Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
8F:						
Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
8G:						
Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
16A:						
Rushville	Severe: ponding.	Severe: shrink-swell, ponding.	Severe: shrink-swell, ponding.	Severe: shrink-swell. ponding.	Severe: low strength, shrink-swell, ponding.	Severe: ponding.
17A:						
Keomah	Severe: wetness.	Severe: shrink-swell, wetness.	Severe: wetness.	Severe: shrink-swell, wetness.	Severe: frost action, low strength, shrink-swell.	Moderate: wetness.
17B:						
Keomah	Severe: wetness.	Severe: shrink-swell, wetness.	Severe: wetness.	Severe: shrink-swell, wetness.	Severe: frost action, low strength, shrink-swell.	Moderate: wetness.
19D3:						
Sylvan	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope.	Severe: slope.	Severe: frost action, low strength.	Moderate: slope.
37B:						
Worthen	Slight	Slight	Slight	Slight	Severe: frost action, low strength.	Slight.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
43A:						
Ipava	Severe: wetness.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: frost action, low strength, shrink-swell.	Moderate: wetness.
45A:						
Denny	Severe: ponding.	Severe: shrink-swell, ponding.	Severe: ponding.	Severe: shrink-swell, ponding.	Severe: low strength, shrink-swell, ponding.	Severe: ponding.
68A:						
Sable	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: frost action, low strength, ponding.	Severe: ponding.
75B:						
Drury	Slight	Slight	Slight	Slight	Severe: frost action, low strength.	Slight.
75C2:						
Drury	Slight	Slight	Slight	Moderate: slope.	Severe: frost action, low strength.	Slight.
86B:						
Osco	Moderate: wetness.	Moderate: shrink-swell.	Moderate: shrink-swell, wetness.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.
86C2:						
Osco	Moderate: wetness.	Moderate: shrink-swell.	Moderate: shrink-swell, wetness.	Moderate: shrink-swell, slope.	Severe: frost action, low strength.	Slight.
88B:						
Sparta	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
102A:						
La Hogue	Severe: wetness, cutbanks cave.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action.	Moderate: wetness.
104A:						
Virgil	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength.	Moderate: wetness.
105B2:						
Batavia	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.
119D2:						
Elco	Moderate: slope, too clayey, wetness.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, slope, wetness.	Severe: slope.	Severe: frost action, low strength.	Moderate: slope.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
119E2: Elco	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: frost action, low strength, slope.	Severe: slope.
134C2: Camden	Slight	Moderate: shrink-swell.	Slight	Moderate: shrink-swell, slope.	Severe: frost action, low strength.	Slight.
134D2: Camden	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope.	Severe: slope.	Severe: frost action, low strength.	Moderate: slope.
134E2: Camden	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: frost action, low strength, slope.	Severe: slope.
150B: Onarga	Severe: cutbanks cave.	Slight	Slight	Slight	Moderate: frost action.	Slight.
198A: Elburn	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength.	Moderate: wetness.
199B: Plano	Moderate: wetness.	Moderate: shrink-swell.	Moderate: shrink-swell, wetness.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.
242A: Kendall	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength.	Moderate: wetness.
243B: St. Charles	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.
257A: Clarksdale	Severe: wetness.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: shrink-swell. wetness.	Severe: frost action, low strength, shrink-swell.	Moderate: wetness.
259C2: Assumption	Moderate: too clayey, wetness.	Moderate: shrink-swell.	Severe: shrink-swell.	Moderate: shrink-swell, slope.	Severe: frost action, low strength.	Slight.
271D2: Timula	Moderate: slope, cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: frost action.	Moderate: slope.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
274E2:						
Seaton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: frost action, low strength, slope.	Severe: slope.
274F:						
Seaton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: frost action, low strength, slope.	Severe: slope.
274G:						
Seaton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: frost action, low strength, slope.	Severe: slope.
279B:						
Rozetta	Moderate: wetness.	Moderate: shrink-swell.	Moderate: shrink-swell, wetness.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.
279C2:						
Rozetta	Moderate: wetness.	Moderate: shrink-swell.	Moderate: shrink-swell, wetness.	Moderate: shrink-swell, slope.	Severe: frost action, low strength.	Slight.
279C3:						
Rozetta	Moderate: wetness.	Moderate: shrink-swell.	Moderate: shrink-swell, wetness.	Moderate: shrink-swell, slope.	Severe: frost action, low strength.	Slight.
280B2:						
Fayette	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.
280C2:						
Fayette	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: frost action, low strength.	Slight.
280D2:						
Fayette	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, slope.	Severe: slope.	Severe: frost action, low strength.	Moderate: slope.
280E2:						
Fayette	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: frost action, low strength, slope.	Severe: slope.
379A:						
Dakota	Severe: cutbanks cave.	Slight	Slight	Slight	Moderate: frost action, low strength.	Slight.
379B:						
Dakota	Severe: cutbanks cave.	Slight	Slight	Slight	Moderate: frost action, low strength.	Slight.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
430B:						
Raddle	Slight	Slight	Slight	Slight	Severe: frost action.	Slight: frost action.
536:						
Dumps, mine.						
549F:						
Marseilles	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: frost action, low strength, slope.	Severe: slope.
549G:						
Marseilles	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: frost action, low strength, slope.	Severe: slope.
558A:						
Breeds	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength.	Moderate: wetness.
567B2:						
Elkhart	Moderate: wetness.	Moderate: shrink-swell.	Moderate: shrink-swell, wetness.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.
567C2:						
Elkhart	Moderate: wetness.	Moderate: shrink-swell.	Moderate: shrink-swell, wetness.	Moderate: shrink-swell, slope.	Severe: frost action, low strength.	Slight.
570B:						
Martinsville	Severe: cutbanks cave.	Moderate: shrink-swell.	Slight	Moderate: shrink-swell.	Moderate: frost action, shrink-swell.	Slight.
596B:						
Marbletown	Slight	Slight	Moderate: shrink-swell.	Slight	Severe: frost action.	Slight.
630C3:						
Navlys	Moderate: wetness.	Slight	Moderate: wetness.	Moderate: slope.	Severe: frost action, low strength.	Slight.
632A:						
Copperas	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: frost action, low strength, shrink-swell.	Severe: frost action, low strength, ponding.	Severe: ponding.
675B:						
Greenbush	Moderate: wetness.	Moderate: shrink-swell.	Moderate: shrink-swell, wetness.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.
779B:						
Chelsea	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
779D:						
Chelsea	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope, droughty.
801B:						
Orthents	Moderate: wetness.	Moderate: shrink-swell.	Moderate: shrink-swell, wetness.	Moderate: shrink-swell, slope.	Severe: frost action, low strength.	Slight.
823B:						
Schuline	Moderate: too clayey, dense layer.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
823D:						
Schuline	Moderate: too clayey, dense layer.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
865:						
Pits, gravel.						
871B:						
Lenzburg	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Moderate: large stones.
871D:						
Lenzburg	Moderate: slope, too clayey.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, slope.	Severe: slope.	Severe: low strength.	Moderate: large stones, slope.
871G:						
Lenzburg	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
872B:						
Rapatee	Moderate: dense layer.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.
876B:						
Lenzwheel	Moderate: dense layer.	Slight	Slight	Moderate: slope.	Moderate: frost action, low strength.	Moderate: droughty.
876D:						
Lenzwheel	Moderate: slope, dense layer.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: frost action, low strength, slope.	Moderate: slope, droughty.
876G:						
Lenzwheel	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
3070A:						
Beaucoup	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, low strength, ponding.	Severe: flooding, ponding.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
3074A:						
Radford	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, frost action, low strength.	Severe: flooding.
3077A:						
Huntsville	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding, frost action, low strength.	Severe: flooding.
3107A:						
Sawmill	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, low strength, wetness.	Severe: flooding, wetness.
3284A:						
Tice	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding, frost action, low strength.	Severe: flooding.
3333A:						
Wakeland	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, frost action, wetness.	Severe: flooding, wetness.
3404A:						
Titus	Severe: ponding.	Severe: flooding, shrink-swell, ponding.	Severe: flooding, shrink-swell, ponding.	Severe: flooding, shrink-swell, ponding.	Severe: low strength, shrink-swell, ponding.	Severe: flooding, too clayey, ponding.
3415A:						
Orion	Severe: wetness, cutbanks cave.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, frost action, low strength.	Severe: flooding.
3451A:						
Lawson	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, frost action.	Severe: flooding.
3634A:						
Blyton	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding, frost action.	Severe: flooding.
3641L:						
Quiver	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, low strength, ponding.	Severe: flooding, ponding.
7081A:						
Littleton	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: frost action, low strength.	Moderate: wetness.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
8070A:						
Beaucoup	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, low strength, ponding.	Severe: ponding.
8092B:						
Sarpy	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
8183A:						
Shaffton	Severe: wetness, cutbanks cave.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
8284A:						
Tice	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding, frost action, low strength.	Moderate: flooding, wetness.
8302A:						
Ambraw	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, low strength, wetness.	Severe: wetness.
8404A:						
Titus	Severe: ponding.	Severe: flooding, shrink-swell, ponding.	Severe: flooding, shrink-swell, ponding.	Severe: flooding, shrink-swell, ponding.	Severe: low strength, shrink-swell, ponding.	Severe: too clayey, ponding.
8415A:						
Orion	Severe: wetness, cutbanks cave.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, frost action, low strength.	Moderate: flooding, wetness.
8595A:						
Coot	Severe: wetness, cutbanks cave.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, frost action.	Moderate: flooding, wetness.
8608A:						
Mudhen	Severe: ponding, cutbanks cave.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, frost action, ponding.	Severe: ponding.
8611A:						
Sepo	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, low strength, ponding.	Severe: ponding.
8875B:						
Lenzlo	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, low strength.	Moderate: flooding, large stones, wetness.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
9017A:						
Keomah	Severe: wetness.	Severe: shrink-swell, wetness.	Severe: wetness.	Severe: shrink-swell, wetness.	Severe: frost action, low strength, shrink-swell.	Moderate: wetness.
9068A:						
Sable	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: frost action, low strength, ponding.	Severe: ponding.
9257A:						
Clarksdale	Severe: wetness.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: frost action, low strength, shrink-swell.	Moderate: wetness.
9279B:						
Rozetta	Moderate: wetness.	Moderate: shrink-swell.	Moderate: shrink-swell, wetness.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.
9279C:						
Rozetta	Moderate: wetness.	Moderate: shrink-swell.	Moderate: shrink-swell, wetness.	Moderate: shrink-swell, slope.	Severe: frost action, low strength.	Slight.

Table 15.--Sanitary Facilities

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
7C3:					
Atlas	Severe: percs slowly, wetness.	Severe: slope.	Severe: too clayey, wetness.	Severe: wetness.	Poor: hard to pack, too clayey.
7D3:					
Atlas	Severe: percs slowly, wetness.	Severe: slope.	Severe: too clayey, wetness.	Severe: wetness.	Poor: hard to pack, too clayey.
8D2:					
Hickory	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: slope, small stones, too clayey.
8E2:					
Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
8F:					
Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
8G:					
Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
16A:					
Rushville	Severe: percs slowly, ponding.	Severe: ponding.	Severe: too clayey, ponding.	Severe: ponding.	Poor: hard to pack, too clayey, ponding.
17A:					
Keomah	Severe: percs slowly, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
17B:					
Keomah	Severe: percs slowly, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
19D3:					
Sylvan	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
37B:					
Worthen	Slight	Moderate: seepage, slope.	Slight	Slight	Good.
43A:					
Ipava	Severe: percs slowly, wetness.	Severe: wetness.	Severe: too clayey, wetness.	Severe: wetness.	Poor: hard to pack, too clayey, wetness.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
45A:					
Denny	Severe: percs slowly, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
68A:					
Sable	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: hard to pack, ponding.
75B:					
Drury	Moderate: percs slowly.	Moderate: seepage, slope.	Slight	Slight	Good.
75C2:					
Drury	Moderate: percs slowly.	Severe: slope.	Slight	Slight	Good.
86B:					
Osco	Moderate: wetness.	Moderate: slope, wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
86C2:					
Osco	Moderate: wetness.	Moderate: slope, wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
88B:					
Sparta	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
102A:					
La Hogue	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: wetness.
104A:					
Virgil	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: wetness.	Poor: wetness.
105B2:					
Batavia	Slight	Severe: seepage.	Severe: seepage.	Slight	Fair: too clayey.
119D2:					
Elco	Severe: percs slowly, wetness.	Severe: slope, wetness.	Moderate: slope, too clayey, wetness.	Moderate: slope, wetness.	Fair: slope, too clayey, wetness.
119E2:					
Elco	Severe: percs slowly, slope, wetness.	Severe: slope, wetness.	Severe: slope.	Severe: slope.	Poor: slope.
134C2:					
Camden	Slight	Severe: slope.	Severe: seepage.	Slight	Fair: too clayey.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
134D2:					
Camden	Moderate: slope.	Severe: slope.	Severe: seepage.	Moderate: slope.	Fair: slope, too clayey.
134E2:					
Camden	Severe: slope.	Severe: slope.	Severe: seepage, slope.	Severe: slope.	Poor: slope.
150B:					
Onarga	Severe: poor filter.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: thin layer.
198A:					
Elburn	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: wetness.	Poor: wetness.
199B:					
Plano	Moderate: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
242A:					
Kendall	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
243B:					
St. Charles	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
257A:					
Clarksdale	Severe: percs slowly, wetness.	Severe: wetness.	Severe: too clayey, wetness.	Severe: wetness.	Poor: hard to pack, too clayey, wetness.
259C2:					
Assumption	Severe: percs slowly, wetness.	Severe: slope, wetness.	Severe: too clayey.	Moderate: wetness.	Poor: too clayey.
271D2:					
Timula	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
274E2:					
Seaton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
274F:					
Seaton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
274G:					
Seaton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
279B:					
Rozetta	Moderate: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
279C2:					
Rozetta	Moderate: wetness.	Severe: slope.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
279C3:					
Rozetta	Moderate: wetness.	Severe: slope.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
280B2:					
Fayette	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
280C2:					
Fayette	Moderate: percs slowly.	Severe: slope.	Moderate: too clayey.	Slight	Fair: too clayey.
280D2:					
Fayette	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: slope, too clayey.
280E2:					
Fayette	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
379A:					
Dakota	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, small stones, too sandy.
379B:					
Dakota	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, small stones, too sandy.
430B:					
Raddle	Moderate: percs slowly.	Moderate: seepage, slope.	Slight	Slight	Good.
536:					
Dumps, mine.					
549F:					
Marseilles	Severe: percs slowly, slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, too clayey, depth to rock.	Severe: slope, depth to rock.	Poor: hard to pack, too clayey, depth to rock.
549G:					
Marseilles	Severe: percs slowly, slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, too clayey, depth to rock.	Severe: slope, depth to rock.	Poor: hard to pack, too clayey, depth to rock.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
558A:					
Breeds	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness, depth to rock.	Severe: wetness.	Poor: wetness.
567B2:					
Elkhart	Moderate: wetness.	Moderate: seepage, slope, wetness.	Severe: wetness.	Moderate: wetness.	Good.
567C2:					
Elkhart	Moderate: wetness.	Severe: slope.	Severe: wetness.	Moderate: wetness.	Good.
570B:					
Martinsville	Slight	Severe: seepage.	Severe: seepage.	Slight	Fair: thin layer.
596B:					
Marbletown	Moderate: percs slowly, depth to rock.	Moderate: seepage, slope, depth to rock.	Severe: depth to rock.	Moderate: depth to rock.	Fair: small stones, too clayey, depth to rock.
630C3:					
Navlys	Moderate: percs slowly, wetness.	Severe: slope.	Severe: wetness.	Moderate: wetness.	Good.
632A:					
Copperas	Severe: percs slowly, ponding.	Severe: ponding.	Severe: ponding, depth to rock.	Severe: ponding.	Poor: ponding.
675B:					
Greenbush	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
779B:					
Chelsea	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
779D:					
Chelsea	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
801B:					
Orthents	Severe: percs slowly, wetness.	Severe: wetness.	Moderate: wetness.	Slight	Fair: wetness.
823B:					
Schuline	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight	Fair: large stones, too clayey.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
823D:					
Schuline	Severe: percs slowly.	Severe: slope.	Moderate: too clayey.	Slight	Fair: large stones, too clayey.
865:					
Pits, gravel.					
871B:					
Lenzburg	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight	Fair: small stones, too clayey.
871D:					
Lenzburg	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: slope, small stones, too clayey.
871G:					
Lenzburg	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
872B:					
Rapatee	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight	Fair: small stones, too clayey.
876B:					
Lenzwheel	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight	Fair: too clayey.
876D:					
Lenzwheel	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: slope, small stones, too clayey.
876G:					
Lenzwheel	Severe: percs slowly, slope.	Moderate: slope.	Severe: slope.	Severe: slope.	Poor: slope.
3070A:					
Beaucoup	Severe: flooding, percs slowly, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: ponding.
3074A:					
Radford	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
3077A:					
Huntsville	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Good.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
3107A:					
Sawmill	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
3284A:					
Tice	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: hard to pack.
3333A:					
Wakeland	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
3404A:					
Titus	Severe: flooding, percs slowly, ponding.	Severe: flooding, ponding.	Severe: flooding, too clayey, ponding.	Severe: flooding, ponding.	Poor: hard to pack, too clayey, ponding.
3415A:					
Orion	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
3451A:					
Lawson	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
3634A:					
Blyton	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: wetness.
3641L:					
Quiver	Severe: flooding, percs slowly, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: ponding.
7081A:					
Littleton	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
8070A:					
Beaucoup	Severe: flooding, percs slowly, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: ponding.
8092B:					
Sarpy	Severe: flooding, poor filter.	Severe: flooding, seepage.	Severe: flooding, seepage, too sandy.	Severe: flooding, seepage.	Poor: seepage, too sandy.
8183A:					
Shaffton	Severe: flooding, wetness, poor filter.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: thin layer.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
8284A:					
Tice	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: hard to pack.
8302A:					
Ambraw	Severe: flooding, percs slowly, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
8404A:					
Titus	Severe: flooding, percs slowly, ponding.	Severe: flooding, ponding.	Severe: flooding, too clayey, ponding.	Severe: flooding, ponding.	Poor: hard to pack, too clayey, ponding.
8415A:					
Orion	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
8595A:					
Coot	Severe: flooding, wetness, poor filter.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, depth to rock.	Severe: flooding, seepage, wetness.	Poor: thin layer, wetness.
8608A:					
Mudhen	Severe: flooding, ponding, poor filter.	Severe: flooding, seepage, ponding.	Severe: flooding, seepage, depth to rock.	Severe: flooding, seepage, ponding.	Poor: seepage, small stones, too sandy.
8611A:					
Sepo	Severe: flooding, percs slowly, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: ponding.
8875B:					
Lenzlo	Severe: flooding, percs slowly, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: thin layer, wetness.
9017A:					
Keomah	Severe: percs slowly, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
9068A:					
Sable	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: hard to pack, ponding.
9257A:					
Clarksdale	Severe: percs slowly, wetness.	Severe: wetness.	Severe: too clayey, wetness.	Severe: wetness.	Poor: hard to pack, too clayey, wetness.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
9279B:					
Rozetta----------------	Moderate: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
9279C:					
Rozetta----------------	Moderate: wetness.	Severe: slope.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.

Table 16.--Construction Materials

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
7C3:				
Atlas	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
7D3:				
Atlas	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
8D2:				
Hickory	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
8E2:				
Hickory	Fair: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
8F:				
Hickory	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
8G:				
Hickory	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
16A:				
Rushville	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
17A:				
Keomah	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
17B:				
Keomah	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
19D3:				
Sylvan	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope, too clayey.
37B:				
Worthen	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
43A:				
Ipava	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
45A:				
Denny	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.

Table 16.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
68A:				
Sable	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
75B:				
Drury	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
75C2:				
Drury	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
86B:				
Osco	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
86C2:				
Osco	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
88B:				
Sparta	Good	Probable	Improbable: too sandy.	Poor: too sandy.
102A:				
La Hogue	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
104A:				
Virgil	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
105B2:				
Batavia	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
119D2:				
Elco	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope, too clayey.
119E2:				
Elco	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
134C2:				
Camden	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
134D2:				
Camden	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: slope, too clayey.
134E2:				
Camden	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
150B:				
Onarga	Good	Probable	Improbable: too sandy.	Fair: area reclaim, thin layer.

Table 16.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
198A:				
Elburn	Fair: wetness.	Probable	Improbable: too sandy.	Good.
199B:				
Plano	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
242A:				
Kendall	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
243B:				
St. Charles	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, too clayey.
257A:				
Clarksdale	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
259C2:				
Assumption	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer, too clayey.
271D2:				
Timula	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
274E2:				
Seaton	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
274F:				
Seaton	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
274G:				
Seaton	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
279B:				
Rozetta	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
279C2:				
Rozetta	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
279C3:				
Rozetta	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
280B2:				
Fayette	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
280C2:				
Fayette	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.

Table 16.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
280D2:				
Fayette	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope, too clayey.
280E2:				
Fayette	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
379A:				
Dakota	Good	Probable	Probable	Poor: area reclaim, small stones.
379B:				
Dakota	Good	Probable	Probable	Poor: area reclaim, small stones.
430B:				
Raddle	Fair: low strength, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Good.
536:				
Dumps, mine.				
549F:				
Marseilles	Poor: low strength, slope, depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, too clayey.
549G:				
Marseilles	Poor: low strength, slope, depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, too clayey.
558A:				
Breeds	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
567B2:				
Elkhart	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
567C2:				
Elkhart	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
570B:				
Martinsville	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, too clayey.
596B:				
Marbletown	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, small stones.

Table 16.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
630C3:				
Navlys	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
632A:				
Copperas	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
675B:				
Greenbush	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
779B:				
Chelsea	Good	Probable	Improbable: too sandy.	Poor: too sandy.
779D:				
Chelsea	Good	Probable	Improbable: too sandy.	Poor: too sandy.
801B:				
Orthents	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
823B:				
Schuline	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, too clayey.
823D:				
Schuline	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, too clayey.
865:				
Pits, gravel.				
871B:				
Lenzburg	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
871D:				
Lenzburg	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
871G:				
Lenzburg	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope, small stones.
872B:				
Rapatee	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
876B:				
Lenzwheel	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.

Table 16.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
876D:				
Lenzwheel	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
876G:				
Lenzwheel	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
3070A:				
Beaucoup	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
3074A:				
Radford	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
3077A:				
Huntsville	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
3107A:				
Sawmill	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
3284A:				
Tice	Fair: low strength, shrink-swell, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
3333A:				
Wakeland	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
3404A:				
Titus	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
3415A:				
Orion	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
3451A:				
Lawson	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
3634A:				
Blyton	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
3641L:				
Quiver	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
7081A:				
Littleton	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.

Table 16.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
8070A:				
Beaucoup	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
8092B:				
Sarpy	Good	Probable	Improbable: too sandy.	Poor: too sandy.
8183A:				
Shaffton	Fair: wetness.	Probable	Improbable: too sandy.	Good.
8284A:				
Tice	Fair: low strength, shrink-swell, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
8302A:				
Ambraw	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
8404A:				
Titus	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
8415A:				
Orion	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
8595A:				
Coot	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
8608A:				
Mudhen	Poor: thin layer, wetness.	Improbable: thin layer.	Improbable: thin layer.	Poor: area reclaim, small stones, wetness.
8611A:				
Sepo	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
8875B:				
Lenzlo	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
9017A:				
Keomah	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
9068A:				
Sable	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
9257A:				
Clarksdale	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.

Table 16.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
9279B:				
Rozetta-----------------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
9279C:				
Rozetta-----------------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.

Table 17.--Water Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Limitations for-- Pond reservoir areas	Limitations for-- Embankments, dikes, and levees	Limitations for-- Aquifer-fed excavated ponds	Features affecting-- Drainage	Features affecting-- Irrigation	Features affecting-- Terraces and diversions	Features affecting-- Grassed waterways
7C3: Atlas	Moderate: slope.	Severe: hard to pack.	Severe: no water.	Frost action, percs slowly, slope.	Slope, wetness, droughty.	Erodes easily, wetness.	Erodes easily, wetness.
7D3: Atlas	Severe: slope.	Severe: hard to pack.	Severe: no water.	Frost action, percs slowly, slope.	Slope, wetness, droughty.	Erodes easily, slope, wetness.	Erodes easily, slope wetness.
8D2: Hickory	Severe: slope.	Moderate: thin layer.	Severe: no water.	Deep to water	Erodes easily, slope.	Erodes easily, slope.	Erodes easily, slope.
8E2: Hickory	Severe: slope.	Moderate: thin layer.	Severe: no water.	Deep to water	Erodes easily, slope.	Erodes easily, slope.	Erodes easily, slope.
8F: Hickory	Severe: slope.	Moderate: thin layer.	Severe: no water.	Deep to water	Erodes easily, slope.	Erodes easily, slope.	Erodes easily, slope.
8G: Hickory	Severe: slope.	Moderate: thin layer.	Severe: no water.	Deep to water	Erodes easily, slope.	Erodes easily, slope.	Erodes easily, slope.
16A: Rushville	Slight	Severe: hard to pack, ponding.	Severe: no water.	Frost action, percs slowly, ponding.	Erodes easily, percs slowly, ponding.	Erodes easily, percs slowly, ponding.	Erodes easily, percs slowly, wetness.
17A: Keomah	Slight	Severe: wetness.	Severe: slow refill.	Frost action, percs slowly.	Percs slowly, wetness.	Erodes easily, wetness.	Erodes easily, percs slowly, wetness.
17B: Keomah	Moderate: slope.	Severe: wetness.	Severe: slow refill.	Frost action, percs slowly, slope.	Percs slowly, slope, wetness.	Erodes easily, wetness.	Erodes easily, percs slowly, wetness.
19D3: Sylvan	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Erodes easily, slope.	Erodes easily, slope.	Erodes easily, slope.

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
37B:							
Worthen	Moderate: seepage, slope.	Moderate: piping.	Severe: no water.	Deep to water	Slope	Erodes easily	Erodes easily.
43A:							
Ipava	Slight	Severe: wetness.	Severe: slow refill.	Frost action	Wetness	Erodes easily, wetness.	Erodes easily, wetness.
45A:							
Denny	Slight	Severe: ponding.	Severe: slow refill.	Frost action, percs slowly, ponding.	Erodes easily, percs slowly, ponding.	Erodes easily, ponding.	Erodes easily, percs slowly, wetness.
68A:							
Sable	Moderate: seepage.	Severe: ponding.	Moderate: slow refill.	Frost action, ponding.	Ponding	Ponding	Wetness.
75B:							
Drury	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Erodes easily, slope.	Erodes easily	Erodes easily.
75C2:							
Drury	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Erodes easily, slope.	Erodes easily	Erodes easily.
86B:							
Osco	Moderate: seepage, slope.	Moderate: piping.	Moderate: slow refill, deep to water.	Frost action, slope, deep to water.	Slope	Erodes easily	Erodes easily.
86C2:							
Osco	Moderate: seepage, slope.	Moderate: piping.	Moderate: slow refill, deep to water.	Frost action, slope.	Slope, wetness.	Erodes easily	Erodes easily.
88B:							
Sparta	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Fast intake, slope, droughty.	Too sandy, soil blowing.	Droughty.
102A:							
La Hogue	Severe: seepage.	Severe: thin layer, wetness.	Severe: cutbanks cave.	Frost action	Wetness	Wetness	Rooting depth, wetness.

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
104A:							
Virgil	Severe: seepage.	Severe: wetness.	Moderate: slow refill.	Frost action	Wetness	Erodes easily, wetness.	Erodes easily, wetness.
105B2:							
Batavia	Severe: seepage.	Moderate: piping, thin layer.	Severe: no water.	Deep to water	Slope	Erodes easily	Erodes easily.
119D2:							
Elco	Severe: slope.	Moderate: piping, wetness.	Severe: no water.	Frost action, slope.	Percs slowly, slope, wetness.	Erodes easily, slope, wetness.	Erodes easily, slope.
119E2:							
Elco	Severe: slope.	Moderate: piping, wetness.	Severe: no water.	Frost action, slope.	Percs slowly, slope, wetness.	Erodes easily, slope, wetness.	Erodes easily, slope.
134C2:							
Camden	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Erodes easily, slope.	Erodes easily	Erodes easily.
134D2:							
Camden	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Erodes easily, slope.	Erodes easily, slope.	Erodes easily, slope.
134E2:							
Camden	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Erodes easily, slope.	Erodes easily, slope.	Erodes easily, slope.
150B:							
Onarga	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Slope, soil blowing.	Soil blowing	Favorable.
198A:							
Elburn	Severe: seepage.	Severe: wetness.	Severe: cutbanks cave.	Frost action	Wetness	Erodes easily, wetness.	Erodes easily, wetness.
199B:							
Plano	Moderate: seepage, slope.	Moderate: piping, thin layer.	Moderate: slow refill, deep to water.	Deep to water	Slope	Erodes easily	Erodes easily.

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
242A:							
Kendall	Moderate: seepage.	Severe: wetness.	Moderate: slow refill.	Frost action	Erodes easily, wetness.	Erodes easily, wetness.	Erodes easily, wetness.
243B:							
St. Charles	Moderate: seepage, slope.	Moderate: piping, thin layer.	Severe: no water.	Deep to water	Erodes easily, slope.	Erodes easily	Erodes easily.
257A:							
Clarksdale	Slight	Severe: wetness.	Severe: slow refill.	Frost action	Erodes easily, wetness.	Erodes easily, wetness.	Erodes easily, wetness.
259C2:							
Assumption	Moderate: seepage, slope.	Moderate: wetness.	Severe: no water.	Frost action, percs slowly, slope.	Percs slowly, slope, wetness.	Erodes easily, wetness.	Erodes easily, percs slowly.
271D2:							
Timula	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Erodes easily, slope.	Erodes easily, slope.	Erodes easily, slope.
274E2:							
Seaton	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Erodes easily, slope.	Erodes easily, slope.	Erodes easily, slope.
274F:							
Seaton	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Erodes easily, slope.	Erodes easily, slope.	Erodes easily, slope.
274G:							
Seaton	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Erodes easily, slope.	Erodes easily, slope.	Erodes easily, slope.
279B:							
Rozetta	Moderate: seepage, slope.	Slight	Moderate: slow refill, deep to water.	Deep to water	Erodes easily, slope.	Erodes easily	Erodes easily.
279C2:							
Rozetta	Moderate: seepage, slope.	Slight	Moderate: slow refill, deep to water.	Deep to water	Erodes easily, slope.	Erodes easily	Erodes easily.

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
279C3:							
Rozetta	Moderate: seepage, slope.	Moderate: piping.	Moderate: slow refill, deep to water.	Deep to water	Erodes easily, slope.	Erodes easily	Erodes easily.
280B2:							
Fayette	Moderate: seepage, slope.	Slight	Severe: no water.	Deep to water	Erodes easily, slope.	Erodes easily	Erodes easily.
280C2:							
Fayette	Moderate: seepage, slope.	Slight	Severe: no water.	Deep to water	Erodes easily, slope.	Erodes easily	Erodes easily.
280D2:							
Fayette	Severe: slope.	Slight	Severe: no water.	Deep to water	Erodes easily, slope.	Erodes easily, slope.	Erodes easily, slope.
280E2:							
Fayette	Severe: slope.	Slight	Severe: no water.	Deep to water	Erodes easily, slope.	Erodes easily, slope.	Erodes easily, slope.
379A:							
Dakota	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Favorable	Too sandy	Favorable.
379B:							
Dakota	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope	Too sandy	Favorable.
430B:							
Raddle	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Erodes easily	Erodes easily.
536:							
Dumps, mine.							
549F:							
Marseilles	Severe: slope.	Severe: thin layer.	Severe: no water.	Deep to water	Percs slowly, slope, depth to rock.	Erodes easily, slope, depth to rock.	Erodes easily, slope, depth to rock.

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
549G:							
Marseilles	Severe: slope.	Severe: thin layer.	Severe: no water.	Deep to water	Percs slowly, slope, depth to rock.	Erodes easily, slope, depth to rock.	Erodes easily, slope, depth to rock.
558A:							
Breeds	Severe: seepage.	Severe: piping, wetness.	Moderate: slow refill, depth to rock.	Frost action	Wetness	Wetness	Wetness.
567B2:							
Elkhart	Moderate: seepage, slope.	Moderate: piping.	Moderate: slow refill, deep to water.	Deep to water	Slope	Erodes easily	Erodes easily.
567C2:							
Elkhart	Moderate: seepage, slope.	Moderate: piping.	Moderate: slow refill, deep to water.	Deep to water	Slope	Erodes easily	Erodes easily.
570B:							
Martinsville	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Slope	Erodes easily	Erodes easily.
596B:							
Marbletown	Moderate: seepage, slope, depth to rock.	Severe: piping.	Severe: no water.	Deep to water	Slope	Erodes easily	Erodes easily.
630C3:							
Navlys	Moderate: seepage, slope.	Severe: piping.	Moderate: slow refill, deep to water.	Deep to water	Erodes easily, slope.	Erodes easily	Erodes easily.
632A:							
Copperas	Moderate: depth to rock.	Severe: ponding.	Severe: slow refill.	Frost action, ponding.	Ponding	Ponding	Wetness.
675B:							
Greenbush	Moderate: seepage, slope.	Moderate: wetness.	Moderate: slow refill, deep to water.	Frost action, slope.	Slope, wetness.	Erodes easily, wetness.	Erodes easily.
779B:							
Chelsea	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Fast intake, slope, droughty.	Too sandy, soil blowing.	Droughty.

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
779D:							
Chelsea	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Fast intake, slope, droughty.	Slope, too sandy, soil blowing.	Slope, droughty.
801B:							
Orthents	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Erodes easily, slope.	Erodes easily	Erodes easily.
823B:							
Schuline	Moderate: slope.	Moderate: piping, thin layer.	Severe: no water.	Deep to water	Percs slowly, rooting depth, slope.	Erodes easily	Erodes easily, rooting depth.
823D:							
Schuline	Moderate: slope.	Moderate: piping, thin layer.	Severe: no water.	Deep to water	Percs slowly, rooting depth, slope.	Erodes easily	Erodes easily, rooting depth.
865:							
Pits, gravel.							
871B:							
Lenzburg	Moderate: slope.	Moderate: piping.	Severe: no water.	Deep to water	Erodes easily, slope.	Erodes easily	Erodes easily.
871D:							
Lenzburg	Severe: slope.	Moderate: piping.	Severe: no water.	Deep to water	Erodes easily, slope.	Erodes easily, slope.	Erodes easily, slope.
871G:							
Lenzburg	Severe: slope.	Moderate: piping.	Severe: no water.	Deep to water	Erodes easily, slope.	Erodes easily, slope.	Erodes easily, slope.
872B:							
Rapatee	Moderate: slope.	Severe: piping.	Severe: no water.	Deep to water	Percs slowly, slope.	Erodes easily, percs slowly.	Erodes easily.
876B:							
Lenzwheel	Moderate: slope.	Moderate: piping.	Severe: no water.	Deep to water	Rooting depth, slope, droughty.	Erodes easily	Erodes easily, droughty.

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
876D:							
Lenzwheel	Moderate: slope.	Moderate: piping.	Severe: no water.	Deep to water	Rooting depth, slope, droughty.	Erodes easily, slope.	Erodes easily, slope, droughty.
876G:							
Lenzwheel	Moderate: slope.	Moderate: piping.	Severe: no water.	Deep to water	Rooting depth, slope, droughty.	Erodes easily, slope.	Erodes easily, slope.
3070A:							
Beaucoup	Slight	Severe: ponding.	Severe: slow refill.	Flooding, frost action, ponding.	Flooding, ponding.	Ponding	Wetness.
3074A:							
Radford	Moderate: seepage.	Severe: wetness.	Moderate: slow refill.	Flooding, frost action.	Flooding, wetness.	Wetness	Wetness.
3077A:							
Huntsville	Moderate: seepage.	Moderate: piping, thin layer.	Severe: no water.	Deep to water	Flooding	Favorable	Favorable.
3107A:							
Sawmill	Moderate: seepage.	Severe: wetness.	Moderate: slow refill.	Flooding, frost action.	Flooding, wetness.	Wetness	Wetness.
3284A:							
Tice	Moderate: seepage.	Severe: wetness.	Moderate: slow refill.	Flooding, frost action.	Wetness	Wetness	Wetness.
3333A:							
Wakeland	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Flooding, frost action.	Erodes easily, flooding, wetness.	Erodes easily, wetness.	Erodes easily, wetness.
3404A:							
Titus	Slight	Severe: ponding.	Severe: slow refill.	Flooding, percs slowly, ponding.	Percs slowly, slow intake, ponding.	Percs slowly, ponding.	Percs slowly, rooting depth, wetness.
3415A:							
Orion	Moderate: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Flooding, frost action.	Wetness	Erodes easily, wetness.	Erodes easily, wetness.

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
3451A:							
Lawson	Moderate: seepage.	Severe: wetness.	Moderate: slow refill.	Flooding, frost action.	Flooding, wetness.	Erodes easily, wetness.	Erodes easily, wetness.
3634A:							
Blyton	Moderate: seepage.	Severe: piping.	Moderate: slow refill.	Flooding, frost action.	Erodes easily, flooding, wetness.	Erodes easily, wetness.	Erodes easily.
3641L:							
Quiver	Slight	Severe: ponding.	Severe: slow refill.	Flooding, frost action, ponding.	Flooding, ponding.	Ponding	Wetness.
7081A:							
Littleton	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Frost action	Wetness	Erodes easily, wetness.	Erodes easily, wetness.
8070A:							
Beaucoup	Slight	Severe: ponding.	Severe: slow refill.	Flooding, frost action, ponding.	Flooding, ponding.	Ponding	Wetness.
8092B:							
Sarpy	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Fast intake, droughty.	Too sandy, soil blowing.	Droughty.
8183A:							
Shaffton	Severe: seepage.	Severe: piping.	Severe: cutbanks cave.	Flooding	Flooding, wetness.	Erodes easily, wetness.	Erodes easily.
8284A:							
Tice	Moderate: seepage.	Severe: wetness.	Moderate: slow refill.	Flooding, frost action.	Wetness	Wetness	Wetness.
8302A:							
Ambraw	Moderate: seepage.	Severe: piping, wetness.	Severe: slow refill.	Flooding, frost action.	Flooding, wetness.	Erodes easily, wetness.	Erodes easily, wetness.
8404A:							
Titus	Slight	Severe: ponding.	Severe: slow refill.	Flooding, percs slowly, ponding.	Percs slowly, slow intake, ponding.	Percs slowly, ponding.	Percs slowly, rooting depth, wetness.

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
8415A:							
Orion	Moderate: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Flooding, frost action.	Wetness	Erodes easily, wetness.	Erodes easily, wetness.
8595A:							
Coot	Severe: seepage.	Severe: thin layer, wetness.	Severe: cutbanks cave.	Flooding, frost action.	Flooding, rooting depth, wetness.	Wetness	Rooting depth, wetness.
8608A:							
Mudhen	Severe: seepage.	Severe: seepage, ponding.	Severe: cutbanks cave.	Flooding, frost action, ponding.	Flooding, rooting depth, ponding.	Too sandy, ponding.	Rooting depth, wetness.
8611A:							
Sepo	Slight	Severe: ponding.	Severe: slow refill.	Flooding, frost action, ponding.	Flooding, ponding.	Ponding	Wetness.
8875B:							
Lenzlo	Moderate: slope.	Severe: piping.	Severe: slow refill.	Flooding, slope.	Erodes easily, slope, wetness.	Erodes easily, wetness.	Erodes easily, wetness.
9017A:							
Keomah	Slight	Severe: wetness.	Severe: slow refill.	Frost action, percs slowly.	Percs slowly, wetness.	Erodes easily, wetness.	Erodes easily, percs slowly, wetness.
9068A:							
Sable	Moderate: seepage.	Severe: ponding.	Moderate: slow refill.	Frost action, ponding.	Ponding	Ponding	Wetness.
9257A:							
Clarksdale	Slight	Severe: wetness.	Severe: slow refill.	Frost action	Erodes easily, wetness.	Erodes easily, wetness.	Erodes easily, wetness.
9279B:							
Rozetta	Moderate: seepage, slope.	Moderate: wetness.	Moderate: slow refill, deep to water.	Deep to water	Erodes easily, slope.	Erodes easily	Erodes easily.

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
9279C:							
Rozetta	Moderate: seepage, slope.	Moderate: wetness.	Moderate: slow refill, deep to water.	Deep to water	Erodes easily, slope.	Erodes easily	Erodes easily.

Table 18.--Engineering Index Properties

(Absence of an entry indicates that the data were not estimated)

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
7C3:												
Atlas-----------	0-4	Silty clay loam	CH, CL	A-7	0	0	100	100	95-100	75-100	40-60	25-40
	4-34	Silty clay loam, clay, clay loam.	CH	A-7	0	0	100	95-100	95-100	75-95	50-70	30-45
	34-77	Silty clay loam, clay, clay loam.	CH	A-7	0	0	100	95-100	95-100	75-95	50-70	30-45
7D3:												
Atlas-----------	0-4	Silty clay loam	CH, CL	A-7	0	0	100	100	95-100	75-100	40-60	25-40
	4-66	Silty clay loam, clay, clay loam.	CH	A-7	0	0	100	95-100	95-100	75-95	50-70	30-45
	66-80	Clay loam, clay, loam.	CL	A-6, A-7	0	0	95-100	90-100	90-100	65-95	35-55	20-30
8D2:												
Hickory---------	0-17	Silt loam------	CL, CL-ML, ML	A-4, A-6	0	0-5	95-100	90-100	90-100	75-95	20-35	3-15
	17-40	Clay loam, silty clay loam, gravelly clay loam.	CL	A-6, A-7	0-1	0-5	95-100	75-100	70-95	65-80	30-50	15-30
	40-60	Sandy loam, loam, gravelly clay loam.	CL, CL-ML	A-4, A-6	0-1	0-5	85-100	75-95	70-95	60-80	20-40	5-20
8E2:												
Hickory---------	0-4	Loam-----------	CL	A-4, A-6	0	0-5	95-100	90-100	90-100	75-95	20-35	8-15
	4-50	Clay loam, silty clay loam, gravelly clay loam.	CL	A-6, A-7	0-1	0-5	95-100	75-100	70-95	65-80	30-50	15-30
	50-60	Sandy loam, loam, gravelly clay loam.	CL, CL-ML	A-4, A-6	0-1	0-5	85-100	75-100	70-95	60-80	20-40	5-20

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
8F:												
Hickory---------	0-7	Silt loam------	CL, CL-ML, ML	A-4, A-6	0	0-5	95-100	90-100	90-100	75-95	20-35	3-15
	7-43	Clay loam, silty clay loam, gravelly clay loam.	CL	A-6, A-7	0-1	0-5	95-100	75-100	70-95	65-80	30-50	15-30
	43-80	Sandy loam, loam, gravelly clay loam.	CL, CL-ML	A-4, A-6	0-1	0-5	85-100	75-95	70-95	60-80	20-40	5-20
8G:												
Hickory---------	0-10	Silt loam------	CL, CL-ML, ML	A-4, A-6	0	0-5	95-100	90-100	90-100	75-95	20-35	3-15
	10-42	Clay loam, silty clay loam, gravelly clay loam.	CL	A-6, A-7	0-1	0-5	95-100	75-100	70-95	65-80	30-50	15-30
	42-80	Sandy loam, loam, gravelly clay loam.	CL, CL-ML	A-4, A-6	0-1	0-5	85-100	75-95	70-95	60-80	20-40	5-20
16A:												
Rushville-------	0-7	Silt loam------	CL, ML, CL-ML	A-4, A-6	0	0	100	100	95-100	90-100	25-40	NP-15
	7-14	Silt loam, silt	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	95-100	20-40	NP-15
	14-43	Silty clay loam, silty clay.	CL, MH, CH, ML	A-7-5, A-7-6	0	0	100	100	95-100	95-100	45-60	15-30
	43-60	Silt loam, silty clay loam.	CL	A-4, A-6, A-7-6	0	0	100	100	95-100	90-100	30-45	8-20
17A:												
Keomah----------	0-8	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	100	95-100	25-35	5-15
	8-15	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	100	95-100	25-35	4-15
	15-42	Silty clay, silty clay loam.	CH	A-7	0	0	100	100	100	95-100	45-60	30-45
	42-60	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	15-30

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
17B:												
Keomah----------	0-6	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	100	95-100	25-35	5-15
	6-11	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	100	95-100	25-35	4-15
	11-60	Silty clay, silty clay loam.	CH	A-7	0	0	100	100	100	95-100	45-60	30-45
19D3:												
Sylvan----------	0-9	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	20-30
	9-28	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	20-30
	28-60	Silt loam, silt	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	95-100	20-40	5-20
37B:												
Worthen---------	0-25	Silt loam------	CL	A-4, A-6	0	0	100	100	95-100	80-100	25-40	7-21
	25-60	Silt loam------	CL	A-4, A-6	0	0	100	100	95-100	80-100	25-40	7-21
43A:												
Ipava-----------	0-20	Silt loam------	CL	A-6	0	0	100	100	95-100	90-100	25-40	10-20
	20-40	Silty clay loam, silty clay.	CH, CL	A-7	0	0	100	100	95-100	90-100	45-70	25-40
	40-60	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	90-100	25-40	5-20
45A:												
Denny-----------	0-9	Silt loam------	CL	A-4, A-6	0	0	100	100	95-100	95-100	30-40	8-15
	9-22	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	95-100	25-40	5-15
	22-45	Silty clay loam, silty clay.	CH, CL	A-6, A-7	0	0	100	100	95-100	95-100	35-60	15-35
	45-70	Silt loam, silty clay loam.	CL	A-6	0	0	100	100	95-100	95-100	25-40	11-20
68A:												
Sable-----------	0-17	Silty clay loam	CH, CL, ML, MH	A-7	0	0	100	100	95-100	95-100	41-65	15-35
	17-23	Silty clay loam	CL, CH, MH, ML	A-7	0	0	100	100	95-100	95-100	41-65	15-35
	23-60	Silty clay loam, silt loam.	CH, CL	A-7	0	0	100	100	95-100	95-100	40-55	20-35

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
75B:												
Drury-----------	0-8	Silt loam------	CL, CL-ML, ML	A-4, A-6	0	0	100	95-100	95-100	90-100	20-35	NP-15
	8-35	Silt loam------	CL	A-4, A-6	0	0	100	95-100	95-100	90-100	25-35	8-15
	35-60	Silt loam, loam, very fine sandy loam.	CL, CL-ML	A-4, A-6	0	0	100	95-100	95-100	55-95	20-30	5-15
75C2:												
Drury-----------	0-6	Silt loam------	CL, CL-ML, ML	A-4, A-6	0	0	100	95-100	95-100	90-100	20-35	NP-15
	6-43	Silt loam------	CL	A-4, A-6	0	0	100	95-100	95-100	90-100	25-35	8-15
	43-80	Silt loam, loam, very fine sandy loam.	CL, CL-ML	A-4, A-6	0	0	100	95-100	95-100	55-95	20-30	5-15
86B:												
Osco------------	0-12	Silt loam------	CL, ML	A-6, A-7	0	0	100	100	100	95-100	35-45	10-20
	12-36	Silty clay loam, silt loam.	CL, ML	A-6, A-7	0	0	100	100	100	95-100	40-50	15-25
	36-60	Silt loam, silty clay loam.	CL, ML	A-6, A-7	0	0	100	100	100	95-100	35-45	15-25
86C2:												
Osco------------	0-12	Silt loam------	CL, ML	A-6, A-7	0	0	100	100	100	95-100	35-45	10-20
	12-36	Silty clay loam, silt loam.	CL, ML	A-6, A-7	0	0	100	100	100	95-100	40-50	15-25
	36-60	Silt loam, silty clay loam.	CL, ML	A-6, A-7	0	0	100	100	100	95-100	35-45	15-25
88B:												
Sparta----------	0-11	Loamy fine sand	SM	A-2, A-4	0	0	85-100	85-100	50-95	15-50	0-14	NP
	11-27	Loamy fine sand, fine sand, sand.	SM, SP-SM	A-2, A-3, A-4	0	0	85-100	85-100	50-95	5-50	0-14	NP
	27-80	Sand, fine sand	SM, SP, SP-SM	A-2, A-3	0	0	85-100	85-100	50-95	2-30	0-14	NP

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
102A:												
La Hogue--------	0-16	Loam-----------	CL, ML, CL-ML	A-4	0	0	100	95-100	80-100	50-80	20-35	3-10
	16-58	Sandy clay loam, silty clay loam, loam.	CL, SC	A-4, A-6	0	0	100	100	80-100	40-85	25-40	8-20
	58-69	Stratified sand to silt loam.	ML, SC, CL, SM	A-2, A-4	0	0	90-100	80-100	50-95	10-70	0-25	NP-10
104A:												
Virgil----------	0-9	Silt loam------	CL	A-4, A-6	0	0	100	100	90-100	85-95	20-35	8-20
	9-15	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	85-95	20-35	5-20
	15-41	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	90-100	30-50	15-30
	41-63	Sandy loam, silty clay loam, clay loam.	CL-ML, SC, CL, SC-SM	A-2-4, A-6, A-2-6, A-4	0	0-5	90-100	85-100	70-100	30-90	20-35	5-15
105B2:												
Batavia---------	0-9	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	95-100	23-38	5-15
	9-46	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	95-100	90-100	27-47	12-28
	46-72	Stratified loamy sand to clay loam.	CL, SC-SM, CL-ML, SC	A-2, A-4, A-6	0	0-5	90-100	80-90	60-90	30-70	10-25	4-15
119D2:												
Elco------------	0-9	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	90-100	25-40	5-15
	9-27	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	95-100	85-100	25-45	10-30
	27-60	Silty clay loam, clay loam, silt loam.	CL	A-6, A-7	0	0	100	90-100	85-95	75-95	25-45	10-30
119E2:												
Elco------------	0-5	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	90-100	25-40	5-15
	5-25	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	95-100	85-100	25-45	10-30
	25-60	Silty clay loam, clay loam, silt loam.	CL	A-6, A-7	0	0	100	90-100	85-95	75-95	25-45	10-30

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
134C2:												
Camden----------	0-8	Silt loam------	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	90-100	20-35	3-15
	8-31	Silt loam, silty clay loam.	CL	A-6	0	0	100	100	95-100	90-100	25-40	15-25
	31-50	Clay loam, sandy loam, silt loam.	ML, CL, SC, SM	A-2, A-4, A-6	0	0-5	90-100	85-100	60-100	30-70	20-40	3-15
	50-80	Stratified sand to silt loam.	ML, CL, SC, SM	A-2, A-4	0	0-5	90-100	80-100	50-80	20-70	0-25	3-10
134D2:												
Camden----------	0-6	Silt loam------	CL-ML, CL, ML	A-4, A-6	0	0	100	100	95-100	90-100	20-35	3-15
	6-26	Silt loam, silty clay loam.	CL	A-6	0	0	100	100	95-100	90-100	25-40	15-25
	26-40	Clay loam, sandy loam, silt loam.	CL, ML, SM, SC	A-2, A-4, A-6	0	0-5	90-100	85-100	60-100	30-70	20-40	3-15
	40-60	Stratified sandy loam to silt loam.	ML, SC, CL, SM	A-2, A-4	0	0-5	90-100	80-100	50-80	20-70	0-25	3-10
134E2:												
Camden----------	0-11	Silt loam------	CL-ML, CL, ML	A-4, A-6	0	0	100	100	95-100	90-100	20-35	3-15
	11-37	Silt loam, silty clay loam.	CL	A-6	0	0	100	100	95-100	90-100	25-40	15-25
	37-49	Clay loam, sandy loam, silt loam.	ML, SC, CL, SM	A-2, A-4, A-6	0	0-5	90-100	85-100	60-100	30-70	20-40	3-15
	49-64	Stratified sand to silt loam.	ML, SC, CL, SM	A-2, A-4	0	0-5	90-100	80-100	50-80	20-70	0-25	3-10
150B:												
Onarga----------	0-17	Fine sandy loam	SC, SC-SM, SM	A-2, A-6, A-4	0	0	100	100	75-95	25-50	0-28	NP-12
	17-45	Loam, sandy clay loam, fine sandy loam.	CL-ML, CL, SC, SC-SM	A-2-6, A-4, A-2-4, A-6	0	0	95-100	95-100	75-95	30-60	19-32	5-14
	45-73	Stratified sand to sandy loam.	SM, SC-SM, SP-SM	A-2, A-4	0	0	85-100	80-100	70-95	12-50	0-20	NP-6

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
198A:												
Elburn----------	0-17	Silt loam------	CL	A-6	0	0	100	100	95-100	90-100	25-40	10-25
	17-54	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	95-100	90-100	30-50	15-35
	54-70	Stratified silt loam to sandy loam.	CL-ML, SC, SC-SM	A-2, A-4	0	0	90-100	80-100	60-90	25-85	20-40	5-20
199B:												
Plano-----------	0-17	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	95-100	20-30	5-15
	17-53	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	95-100	95-100	25-45	10-25
	53-70	Stratified sandy loam to silt loam.	CL, SM, ML, SC	A-2, A-4	0	0-5	90-100	85-95	60-90	30-70	0-25	NP-10
242A:												
Kendall---------	0-16	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	90-100	20-35	5-15
	16-44	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	90-100	30-45	10-20
	44-60	Silt loam, loam	CL, CL-ML	A-2, A-4	0	0-5	95-100	95-100	60-95	55-80	0-25	4-10
243B:												
St. Charles-----	0-8	Silt loam------	CL	A-4, A-6	0	0	100	100	95-100	95-100	22-35	7-15
	8-70	Silty clay loam, silt loam.	CL	A-6	0	0	100	100	95-100	90-100	30-40	10-20
	70-80	Clay loam, silt loam, sandy loam.	CL, SC	A-4, A-6	0	0	90-100	75-100	75-95	40-80	20-35	8-20
257A:												
Clarksdale------	0-7	Silt loam------	CL	A-6	0	0	100	100	95-100	90-100	25-40	10-20
	7-13	Silt loam------	CL	A-4, A-6	0	0	100	100	95-100	90-100	20-35	8-18
	13-42	Silty clay loam, silty clay.	CH, CL	A-7	0	0	100	100	95-100	90-100	40-65	25-40
	42-60	Silt loam, silty clay loam.	CL	A-6	0	0	95-100	95-100	95-100	90-100	25-40	10-25

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	Percentage passing sieve number--: 10	Percentage passing sieve number--: 40	Percentage passing sieve number--: 200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
259C2:												
Assumption------	0-8	Silt loam------	CL	A-4, A-6	0	0	100	100	95-100	90-100	25-40	8-20
	8-24	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	95-100	90-100	30-50	10-30
	24-60	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	90-100	85-95	75-90	30-50	10-30
271D2:												
Timula----------	0-20	Silt loam------	ML	A-4	0	0	100	100	95-100	85-100	25-35	NP-10
	20-60	Silt loam, silt	ML	A-4	0	0	100	100	95-100	85-100	25-35	NP-10
274E2:												
Seaton----------	0-6	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	100	95-100	20-35	5-15
	6-47	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	100	90-100	25-40	5-20
	47-60	Silt loam, silt	CL, CL-ML	A-4, A-6	0	0	100	100	100	90-100	25-40	5-20
274F:												
Seaton----------	0-9	Silt loam------	CL, CL-ML, ML	A-4, A-6, A-7	0	0	100	100	100	95-100	20-45	5-20
	9-58	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	100	90-100	25-40	5-20
	58-80	Silt loam, silt	CL, CL-ML	A-4, A-6	0	0	100	100	100	90-100	25-40	5-20
274G:												
Seaton----------	0-8	Silt loam------	CL, CL-ML, ML	A-6, A-4, A-7	0	0	100	100	100	95-100	20-45	5-20
	8-46	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	100	90-100	25-40	5-20
	46-60	Silt loam, silt	CL, CL-ML	A-4, A-6	0	0	100	100	100	90-100	25-40	5-20
279B:												
Rozetta---------	0-7	Silt loam------	CL	A-4, A-6	0	0	100	100	95-100	95-100	24-35	8-15
	7-11	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	95-100	20-30	5-15
	11-55	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	95-100	35-50	15-30
	55-60	Silt loam, silty clay loam.	CL	A-4, A-6	0	0	100	100	95-100	85-100	25-40	7-20

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >10 inches	Fragments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
279C2:												
Rozetta---------	0-8	Silt loam------	CL	A-4, A-6	0	0	100	100	95-100	95-100	24-35	8-15
	8-13	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	95-100	20-30	5-15
	13-56	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	95-100	35-50	15-30
	56-80	Silt loam, silty clay loam.	CL	A-4, A-6	0	0	100	100	95-100	85-100	25-40	7-20
279C3:												
Rozetta---------	0-6	Silty clay loam	CL, ML	A-6, A-7	0	0	100	100	95-100	95-100	35-45	10-20
	6-33	Silty clay loam	ML	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-20
	33-60	Silt loam------	CL	A-4, A-6	0	0	100	100	90-100	85-100	25-40	7-20
280B2:												
Fayette---------	0-8	Silt loam------	CL	A-6, A-7	0	0	100	100	100	95-100	30-45	10-25
	8-56	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	100	95-100	35-45	15-25
	56-80	Silt loam------	CL	A-6	0	0	100	100	100	95-100	30-40	10-20
280C2:												
Fayette---------	0-8	Silt loam------	CL	A-6, A-7	0	0	100	100	100	95-100	30-45	10-25
	8-64	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	100	95-100	35-45	15-25
	64-80	Silt loam------	CL	A-6	0	0	100	100	100	95-100	30-40	10-20
280D2:												
Fayette---------	0-6	Silt loam------	CL	A-6, A-7	0	0	100	100	100	95-100	30-45	10-25
	6-48	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	100	95-100	35-45	15-25
	48-60	Silt loam------	CL	A-6	0	0	100	100	100	95-100	30-40	10-20
280E2:												
Fayette---------	0-4	Silt loam------	CL	A-6, A-7	0	0	100	100	100	95-100	30-45	10-25
	4-60	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	100	95-100	35-45	15-25
	60-77	Silt loam------	CL	A-6	0	0	100	100	100	95-100	30-40	10-20

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
379A:												
Dakota----------	0-20	Loam-----------	CL	A-4, A-6	0	0	95-100	85-100	75-95	50-75	25-35	7-15
	20-27	Loam, sandy clay loam, clay loam.	CL, SC	A-4, A-6	0	0	95-100	85-100	70-100	35-80	25-40	9-20
	27-52	Sandy loam, loamy sand, very gravelly loamy coarse sand.	GP, GM, SM, SP	A-2, A-3, A-1, A-4	0-1	0-5	55-100	45-100	20-75	2-40	0-21	NP-4
	52-70	Sand, gravelly coarse sand, loamy sand.	GP, SM, GM, SP	A-1, A-2, A-3	0-1	0-5	50-100	45-100	20-75	2-30	0-14	NP
379B:												
Dakota----------	0-16	Loam-----------	CL	A-4, A-6	0	0	95-100	85-100	75-95	50-75	25-35	7-15
	16-22	Loam, sandy clay loam, clay loam.	CL, SC	A-4, A-6	0	0	95-100	85-100	70-100	35-80	25-40	9-20
	22-48	Sandy loam, gravelly clay loam, gravelly loamy coarse sand.	GM, SP, GP, SM	A-1, A-2, A-4, A-3	0-1	0-5	55-100	45-100	20-75	2-40	0-21	NP-4
	48-80	Sand, gravelly coarse sand, loamy sand.	GP, GM, SM, SP	A-2, A-1, A-3	0-1	0-5	50-100	45-100	20-75	2-30	0-14	NP
430B:												
Raddle----------	0-13	Silt loam------	CL	A-4, A-6	0	0	100	100	95-100	85-100	25-35	8-15
	13-60	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	80-100	20-30	4-14
536:												
Dumps, mine.												
549F:												
Marseilles------	0-9	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	85-100	25-40	5-15
	9-43	Silty clay loam, silty clay, clay loam.	CH, CL	A-7	0-1	0-5	95-100	90-100	85-100	80-95	40-60	15-30
	43-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---	---

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
549G:												
Marseilles------	0-4	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	85-100	25-40	5-15
	4-32	Silty clay loam, silty clay, clay loam.	CH, CL	A-7	0-1	0-5	95-100	90-100	85-100	80-95	40-60	15-30
	32-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---	---
558A:												
Breeds----------	0-16	Silty clay loam	CL	A-7-6, A-6	---	0	100	100	90-100	85-100	30-45	10-20
	16-40	Silty clay loam, silt loam.	CL-ML, CL	A-4, A-7, A-6	---	0	100	100	90-100	85-100	30-50	15-35
	40-46	Stratified clay loam to sandy clay loam.	SC, CL	A-4, A-6	---	0-3	90-95	80-95	70-90	40-70	20-35	8-15
	46-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---	---
567B2:												
Elkhart---------	0-8	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	18-30
	8-32	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	18-30
	32-60	Silt loam, silt	CL	A-4, A-6	0	0	100	100	95-100	95-100	20-37	8-20
567C2:												
Elkhart---------	0-8	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	18-30
	8-32	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	18-30
	32-60	Silt loam, silt	CL	A-4, A-6	0	0	100	100	95-100	95-100	20-37	8-20
570B:												
Martinsville----	0-11	Loam-----------	CL-ML, CL, ML	A-4	0	0	100	80-100	75-100	65-90	0-25	3-8
	11-37	Clay loam, silty clay loam, sandy clay loam.	CL, SC	A-4, A-2, A-6	0	0	95-100	85-100	70-100	30-95	25-40	7-15
	37-60	Stratified sandy loam to loam to sandy clay loam.	CL-ML, CL, SC, SC-SM	A-2, A-4, A-6	0	0	95-100	85-100	55-95	30-75	20-30	5-11

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
596B:												
Marbletown------	0-14	Silt loam------	ML	A-6, A-4	---	---	100	100	95-100	85-100	25-40	4-15
	14-31	Silt loam------	ML	A-6, A-4	---	---	100	100	90-100	80-100	20-35	4-15
	31-50	Loam, gravelly clay loam, clay loam.	ML	A-4, A-6, A-7	---	---	100	70-95	60-85	50-85	30-50	10-25
	50-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---	---
630C3:												
Navlys----------	0-6	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	20-30
	6-31	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	20-30
	31-60	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	95-100	20-40	5-20
632A:												
Copperas--------	0-16	Silty clay loam	CL	A-7, A-6	---	---	100	100	90-100	85-100	30-50	15-30
	16-54	Silty clay loam, silt loam.	CL	A-7, A-6	---	---	100	90-100	90-100	85-100	30-50	15-30
	54-63	Weathered bedrock.	---	---	---	---	---	---	---	---	---	---
675B:												
Greenbush-------	0-9	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	100	95-100	25-35	5-15
	9-14	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-45	15-25
	14-60	Silt loam------	CL	A-6	0	0	100	100	100	95-100	30-40	11-20
779B:												
Chelsea---------	0-13	Loamy fine sand	SM, SP-SM	A-2-4	0	0	100	100	65-95	10-35	0-14	NP
	13-60	Fine sand, sand, loamy sand.	SM, SP, SP-SM	A-2-4, A-3	0	0	100	100	65-95	3-15	0-14	NP
779D:												
Chelsea---------	0-13	Loamy fine sand	SM, SP-SM	A-2-4	0	0	100	100	65-95	10-35	0-14	NP
	13-60	Fine sand, sand, sandy loam.	SM, SP, SP-SM	A-2-4, A-3	0	0	100	100	65-95	3-15	0-14	NP
801B:												
Orthents--------	0-80	Silt loam------	CL, CL-ML	A-4, A-6, A-7	0	0	100	100	90-100	80-95	25-45	5-25

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
823B:												
Schuline--------	0-6	Silty clay loam	CL	A-6, A-7	0-1	0-2	90-100	85-100	80-95	75-90	30-50	10-25
	6-60	Loam, silty clay loam, clay loam.	CL	A-6, A-7	0-2	0-5	90-100	85-100	80-95	70-85	30-50	10-25
823D:												
Schuline--------	0-5	Silty clay loam	CL	A-6, A-7	0-1	0-2	90-100	85-100	80-95	75-90	30-50	10-25
	5-60	Loam, silty clay loam, clay loam.	CL	A-6, A-7	0-2	0-5	90-100	85-100	80-95	70-85	30-50	10-25
865:												
Pits, gravel.												
871B:												
Lenzburg--------	0-5	Silt loam------	CL	A-4, A-6	0-1	2-10	80-100	75-100	65-95	55-85	25-40	8-20
	5-37	Silt loam, silty clay loam, clay loam.	CL	A-6, A-7	0-2	2-10	80-95	75-90	70-90	55-85	25-45	10-25
	37-80	Silty clay loam, silt loam, gravelly loam.	CL	A-6, A-7	0-2	5-15	75-95	70-90	65-85	60-85	25-45	10-25
871D:												
Lenzburg--------	0-5	Silty clay loam	CL	A-6, A-7	0-1	2-10	80-100	75-100	65-95	55-85	35-50	15-25
	5-8	Silt loam, silty clay loam, clay loam.	CL	A-6, A-7	0-2	2-10	80-95	75-90	70-90	55-85	25-45	10-25
	8-60	Silty clay loam, silt loam, gravelly loam.	CL	A-6, A-7	0-2	5-15	75-95	70-90	65-85	60-85	25-45	10-25

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
871G:												
Lenzburg--------	0-4	Silty clay loam	CL	A-6, A-7	0-1	2-10	80-100	75-100	65-95	55-85	35-50	15-25
	4-14	Silty clay loam, clay loam, gravelly silty clay loam.	CL	A-6, A-7	0-2	2-10	80-95	75-85	55-70	55-70	25-45	10-25
	14-60	Silty clay loam, silt loam, very gravelly loam.	CL	A-6, A-7	0-2	5-15	75-95	55-70	50-60	50-60	25-45	10-25
872B:												
Rapatee---------	0-5	Silty clay loam	CL-ML	A-6, A-7	0	0	100	100	95-100	90-100	35-45	7-15
	5-50	Silty clay loam, silt loam.	CL-ML, CL, ML	A-6, A-4, A-7	---	0-10	100	75-100	70-100	65-95	25-50	5-20
	50-80	Clay loam, silty clay loam, loam.	CL, CL-ML, ML	A-4, A-6	---	0-15	95-100	65-90	60-85	55-80	15-40	2-20
876B:												
Lenzwheel-------	0-19	Silt loam------	CL	A-4, A-6	0	0	100	95-100	80-100	70-95	25-40	8-20
	19-80	Clay loam, silty clay loam, silt loam.	ML, CL-ML, CL	A-4, A-6	0	0-5	90-100	80-95	75-85	60-80	15-40	2-20
876D:												
Lenzwheel-------	0-30	Silty clay loam	CL	A-7, A-6	0	0-2	90-100	85-100	80-95	75-90	20-50	10-25
	30-80	Clay loam, silty clay loam, silt loam.	ML, CL-ML, CL	A-4, A-6	0	0-5	90-100	80-95	75-85	60-80	15-40	2-20
876G:												
Lenzwheel-------	0-7	Silty clay loam	CL	A-7, A-6	0	0-2	90-100	85-100	80-95	75-90	20-50	10-25
	7-80	Clay loam, silty clay loam, silt loam.	CL-ML, ML, CL	A-4, A-6	0	0-5	90-100	80-95	75-85	60-80	15-40	2-20

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
3070A:												
Beaucoup--------	0-19	Silty clay loam	CL	A-6, A-7	0	0	100	100	90-100	85-100	30-45	15-25
	19-42	Silty clay loam	CL	A-6, A-7	0	0	100	100	90-100	85-100	30-45	15-30
	42-65	Stratified very fine sandy loam to silty clay loam.	CL, CL-ML	A-4, A-6, A-7	0	0	100	100	90-100	75-95	30-45	10-25
3074A:												
Radford---------	0-15	Silt loam------	CL, ML	A-4, A-6	0	0	100	100	95-100	80-100	30-40	5-15
	15-24	Silt loam------	CL, ML	A-4, A-6	0	0	100	100	95-100	80-100	25-35	5-15
	24-60	Silt loam, silty clay loam, clay loam.	CL	A-6, A-7	0	0	100	100	95-100	80-95	35-50	15-25
3077A:												
Huntsville------	0-43	Silt loam------	CL	A-6	0	0	100	95-100	90-100	85-100	25-40	10-20
	43-60	Silt loam------	CL	A-6	0	0	100	95-100	90-100	85-100	20-35	10-20
3107A:												
Sawmill---------	0-26	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-100	30-50	15-30
	26-54	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-100	30-50	15-30
	54-60	Silty clay loam, clay loam, loam.	CL	A-4, A-6, A-7	0	0	100	100	85-100	70-95	25-50	8-25
3284A:												
Tice------------	0-14	Silty clay loam	CL	A-6, A-7	0	0	100	100	90-100	80-95	30-45	10-20
	14-52	Silty clay loam, silt loam.	CH, CL	A-7	0	0	100	100	95-100	85-95	40-55	15-30
	52-72	Stratified loam to silty clay loam.	CL, CL-ML	A-6, A-4, A-7	0	0	100	100	60-95	55-80	25-45	5-20
3333A:												
Wakeland--------	0-8	Silt loam------	CL, CL-ML, ML	A-4	0	0	100	100	90-100	80-100	16-28	3-9
	8-80	Silt loam------	CL, ML, CL-ML	A-4	0	0	100	100	90-100	80-100	16-28	3-9

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
3404A:												
Titus-----------	0-16	Silty clay-----	CH, CL	A-7	0	0	100	100	95-100	90-100	40-55	20-30
	16-64	Silty clay loam, silty clay.	CH, CL	A-7	0	0	100	100	95-100	90-100	40-55	20-30
	64-72	Silty clay loam, silt loam, loam.	CL	A-6	0	0	100	90-100	70-90	55-85	20-40	10-25
3415A:												
Orion-----------	0-7	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	85-100	80-100	25-35	4-12
	7-22	Stratified very fine sand to silt loam.	CL, CL-ML	A-4	0	0	100	100	90-100	70-80	20-30	4-10
	22-60	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	0	100	100	85-100	85-100	20-40	4-18
	60-80	Stratified sand to silt loam.	CL, CL-ML	A-4	0	0	80-100	80-100	80-100	80-100	20-30	4-10
3451A:												
Lawson----------	0-9	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	85-100	20-40	5-20
	9-29	Silt loam, silty clay loam.	CL, CL-ML	A-4	0	0	100	100	90-100	85-100	20-30	5-10
	29-46	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	90-100	60-100	20-45	10-25
	46-80	Stratified sandy loam to silty clay loam.	CL, SC-SM, CL-ML, SC	A-4, A-6	0	0	100	100	60-100	35-85	20-35	5-20
3634A:												
Blyton----------	0-10	Silt loam------	CL, CL-ML, ML	A-4	0	0	100	100	90-100	70-90	20-30	3-10
	10-80	Silt loam------	CL, ML, CL-ML	A-4	0	0	100	100	90-100	70-100	20-30	3-10
3641L:												
Quiver----------	0-9	Silty clay loam	CL	A-7, A-6	---	---	100	100	90-100	85-100	20-45	15-25
	9-65	Silty clay loam, silt loam.	CL	A-7, A-6	---	---	100	95-100	80-100	60-100	20-45	10-25

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	Percentage passing sieve number--: 10	Percentage passing sieve number--: 40	Percentage passing sieve number--: 200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
7081A:												
Littleton-------	0-9	Silt loam------	CL	A-4, A-6	0	0	100	100	95-100	90-100	25-40	7-20
	9-46	Silt loam------	CL	A-4, A-6	0	0	100	100	95-100	90-100	25-40	7-20
	46-80	Silt loam------	CL, CL-ML	A-4, A-6, A-7	0	0	100	100	95-100	80-100	20-45	5-20
8070A:												
Beaucoup--------	0-17	Silty clay loam	CL	A-6, A-7	0	0	100	100	90-100	85-100	30-45	15-25
	17-60	Silty clay loam	CL	A-6, A-7	0	0	100	100	90-100	85-100	30-45	15-30
8092B:												
Sarpy-----------	0-6	Sand-----------	SM, SP-SM, SP	A-2-4, A-3	0	0	100	100	60-80	2-15	0-14	NP
	6-80	Fine sand, loamy fine sand, sand.	SP, SM, SP-SM	A-2-4, A-3	0	0	100	100	60-80	2-35	0-14	NP
8183A:												
Shaffton--------	0-12	Clay loam------	CL	A-6	0	0	100	100	85-95	60-80	30-40	11-20
	12-32	Loam-----------	CL, CL-ML	A-4, A-6	0	0	100	100	85-95	55-65	25-35	5-15
	32-36	Loamy sand, sandy loam.	SC-SM, SM, SP-SM	A-2	0	0	100	100	50-75	10-30	0-15	NP-5
	36-51	Silty clay loam	CL	A-6, A-7	0	0	100	100	90-100	80-95	35-45	15-25
	51-60	Coarse sand, fine sand, sand.	SP-SM, SP, SW, SW-SM	A-1	0	0	90-100	90-95	20-35	3-5	0-14	NP
8284A:												
Tice------------	0-14	Silty clay loam	CL	A-6, A-7	0	0	100	100	90-100	80-95	30-45	10-20
	14-42	Silty clay loam, silt loam.	CH, CL	A-7	0	0	100	100	95-100	85-95	40-55	15-30
	42-60	Stratified loam to silty clay loam.	CL, CL-ML	A-4, A-6, A-7	0	0	100	100	80-100	80-95	20-40	5-20

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
8302A:												
Ambraw	0-16	Clay loam	CL	A-6, A-7	0	0	100	100	85-95	55-80	30-45	10-20
	16-33	Clay loam, clay, loam.	CH, CL	A-6, A-7	0	0	100	100	80-90	60-80	35-55	15-30
	33-41	Clay loam, sandy clay loam.	CL	A-6, A-7	0	0	100	90-100	85-95	40-80	30-50	10-25
	41-70	Stratified sandy loam to clay loam.	ML, SC, CL, SM	A-4, A-6	0	0	100	90-100	80-90	40-80	20-40	NP-17
8404A:												
Titus	0-15	Silty clay	CH, CL	A-7	0	0	100	100	95-100	90-100	40-55	20-30
	15-51	Silty clay loam, silty clay.	CH, CL	A-7	0	0	100	100	95-100	90-100	40-55	20-30
	51-60	Silty clay loam, silt loam, loam.	CL	A-6	0	0	100	90-100	70-90	55-85	20-40	10-25
8415A:												
Orion	0-6	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	85-100	80-100	25-35	4-12
	6-25	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	70-80	20-30	4-10
	25-60	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	0	100	100	85-100	85-100	20-40	4-18
8595A:												
Coot	0-15	Loam	CL-ML, CL	A-6, A-4	0	0	95-100	95-100	90-100	75-95	25-35	5-15
	15-22	Clay loam, sandy clay loam.	CL-ML	A-6, A-7	0	0	95-100	90-100	85-95	55-90	35-45	10-20
	22-31	Gravelly sandy clay loam, gravelly clay loam, gravelly sandy loam.	GC, SC-SM, SC, CL	A-2-6, A-4, A-6, A-2	0	0-5	70-90	60-85	55-70	30-60	20-35	6-15
	31-41	Gravelly coarse sand, sand, gravel.	SP-SM, GP-GM, GP, SP	A-1	---	0-10	30-70	30-55	10-30	2-12	15-35	NP
	41-60	Weathered bedrock.	---	---	0	---	---	---	---	---	---	---

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
8608A:												
Mudhen----------	0-12	Clay loam------	ML, CL	A-7	0	0	95-100	95-100	90-100	80-95	45-60	20-35
	12-23	Clay loam, sandy clay loam.	ML, CL	A-6, A-7	0	0	95-100	90-100	85-95	50-90	35-45	10-20
	23-28	Gravelly sandy clay loam, gravelly clay loam, gravelly sandy loam.	GC, SC, SC-SM, CL	A-4, A-2, A-2-6, A-6	0	0-5	70-90	60-85	55-70	30-60	20-35	6-15
	28-41	Gravelly loamy coarse sand, sand, gravel.	SP-SM, GP, GP-GM, SP	A-1	0	0-10	30-70	30-55	10-30	2-12	---	NP
	41-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---	---
8611A:												
Sepo------------	0-19	Silty clay loam	ML, CL	A-7, A-6	0	0	100	100	90-100	85-100	35-50	10-25
	19-42	Silty clay loam	CL	A-7, A-6	0	0	100	100	90-100	85-100	30-45	15-20
	42-70	Stratified silty clay loam to silt loam.	CL	A-6, A-4	0	0	100	90-100	90-100	70-100	25-40	8-20
8875B:												
Lenzlo----------	0-3	Silty clay loam	CL	A-7, A-6	0	2-10	90-100	85-100	80-95	75-95	35-50	15-25
	3-80	Silty clay loam, silt loam, clay loam.	CL-ML, CL	A-7, A-4, A-6	0	0-10	80-95	75-90	70-90	65-90	25-45	10-25
9017A:												
Keomah----------	0-9	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	100	95-100	25-35	5-15
	9-16	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	100	95-100	25-35	4-15
	16-49	Silty clay, silty clay loam.	CH	A-7	0	0	100	100	100	95-100	45-60	30-45
	49-80	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	15-30

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	Percentage passing sieve number--: 10	Percentage passing sieve number--: 40	Percentage passing sieve number--: 200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
9068A:												
Sable-----------	0-13	Silty clay loam	CH, CL, ML, MH	A-7	0	0	100	100	95-100	95-100	41-65	15-35
	13-19	Silty clay loam	CL, MH, CH, ML	A-7	0	0	100	100	95-100	95-100	41-65	15-35
	19-55	Silty clay loam, silt loam.	CH, CL	A-7	0	0	100	100	95-100	95-100	40-55	20-35
	55-80	Silt loam, silty clay loam.	CL	A-6	0	0	100	100	95-100	95-100	30-40	10-20
9257A:												
Clarksdale------	0-10	Silt loam------	CL	A-6	0	0	100	100	95-100	90-100	25-40	10-20
	10-16	Silt loam------	CL	A-4, A-6	0	0	100	100	95-100	90-100	20-35	8-18
	16-46	Silty clay loam, silty clay.	CH, CL	A-7	0	0	100	100	95-100	90-100	40-65	25-40
	46-80	Silt loam, silty clay loam.	CL	A-6	0	0	95-100	95-100	95-100	90-100	25-40	10-25
9279B:												
Rozetta---------	0-9	Silt loam------	CL	A-4, A-6	0	0	100	100	95-100	95-100	24-35	8-15
	9-66	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	95-100	35-50	15-30
	66-76	Silt loam, silty clay loam.	CL	A-4, A-6	0	0	100	100	95-100	85-100	25-40	7-20
9279C:												
Rozetta---------	0-7	Silt loam------	CL	A-4, A-6	0	0	100	100	95-100	95-100	24-35	8-15
	7-66	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	95-100	35-50	15-30
	66-70	Silt loam, silty clay loam.	CL	A-4, A-6	0	0	100	100	95-100	85-100	25-40	7-20

Table 19.--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	Permea-bility (Ksat)	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index	Soil reaction	Cation-exchange capacity	Calcium carbonate
	In	Pct	g/cc	In/hr	In/in	Pct	Pct						pH	meq/100g	Pct
7C3:															
Atlas---------	0-4	30-40	1.35-1.55	0.06-0.2	0.18-0.20	6.0-8.9	0.5-1.0	.28	.28	5	7	38	4.5-7.3	19-26	0
	4-34	35-45	1.35-1.55	0.00-0.06	0.11-0.19	6.0-8.9	0.0-1.0	.28	.28				4.5-7.3	21-29	0
	34-77	30-45	1.35-1.55	0.00-0.06	0.11-0.19	6.0-8.9	0.0-1.0	.28	.28				4.5-7.8	18-29	0-25
7D3:															
Atlas---------	0-4	30-40	1.35-1.55	0.06-0.2	0.18-0.20	6.0-8.9	0.5-1.0	.28	.28	5	7	38	4.5-7.3	19-26	0
	4-66	30-45	1.35-1.55	0.00-0.06	0.11-0.19	6.0-8.9	0.0-1.0	.28	.28				4.5-7.8	18-29	0-25
	66-80	20-30	1.35-1.60	0.06-0.2	0.15-0.18	3.0-5.9	0.0-1.0	.28	.28				6.1-7.8	12-20	0-25
8D2:															
Hickory-------	0-17	19-25	1.30-1.50	0.6-2.0	0.20-0.22	0.0-2.9	1.0-2.0	.32	.32	5	6	48	4.5-7.3	14-19	0
	17-40	27-35	1.45-1.65	0.6-2.0	0.15-0.19	3.0-5.9	0.0-0.5	.24	.28				4.5-7.3	16-22	0
	40-60	15-32	1.50-1.70	0.6-2.0	0.11-0.19	0.0-2.9	0.0-0.2	.24	.28				5.1-8.4	9-19	0-15
8E2:															
Hickory-------	0-4	19-25	1.30-1.50	0.6-2.0	0.20-0.22	0.0-2.9	1.0-2.0	.32	.32	5	6	48	4.5-7.3	14-19	0
	4-50	27-35	1.45-1.65	0.6-2.0	0.15-0.19	3.0-5.9	0.0-0.5	.24	.28				4.5-6.0	16-22	0
	50-60	15-32	1.50-1.70	0.6-2.0	0.10-0.15	0.0-2.9	0.0-0.2	.24	.28				5.1-8.4	9-19	0-15
8F:															
Hickory-------	0-7	19-25	1.30-1.50	0.6-2.0	0.20-0.22	0.0-2.9	1.0-2.0	.32	.32	5	6	48	4.5-7.3	14-19	0
	7-43	27-35	1.45-1.65	0.6-2.0	0.15-0.19	3.0-5.9	0.0-0.5	.24	.28				4.5-7.3	16-22	0
	43-80	15-32	1.50-1.70	0.6-2.0	0.11-0.19	0.0-2.9	0.0-0.2	.24	.28				5.1-8.4	9-19	0-15
8G:															
Hickory-------	0-10	19-25	1.30-1.50	0.6-2.0	0.20-0.22	0.0-2.9	1.0-2.0	.32	.32	5	6	48	4.5-7.3	14-19	0
	10-42	27-35	1.45-1.65	0.6-2.0	0.15-0.19	3.0-5.9	0.0-0.5	.24	.28				4.5-7.3	16-22	0
	42-80	15-32	1.50-1.70	0.6-2.0	0.11-0.19	0.0-2.9	0.0-0.2	.24	.28				5.1-8.4	9-19	0-15
16A:															
Rushville-----	0-7	15-27	1.25-1.45	0.6-2.0	0.22-0.24	0.0-2.9	1.0-3.0	.43	.43	5	6	48	4.5-7.3	10-20	---
	7-14	10-22	1.30-1.50	0.06-0.2	0.15-0.20	0.0-2.9	0.0-1.0	.55	.55				4.5-7.3	5-13	---
	14-43	30-42	1.40-1.60	0.00-0.2	0.11-0.20	6.0-8.9	0.0-0.5	.43	.43				4.5-7.8	15-22	---
	43-60	18-30	1.40-1.55	0.06-0.2	0.16-0.21	3.0-5.9	0.0-0.5	.49	.49				5.6-8.4	9-16	---
17A:															
Keomah--------	0-8	16-26	1.30-1.40	0.6-2.0	0.22-0.24	0.0-2.9	1.0-2.0	.37	.37	3	6	48	4.5-7.3	15-20	0
	8-15	16-26	1.35-1.45	0.2-0.6	0.18-0.20	0.0-2.9	0.2-1.0	.49	.49				4.5-7.3	15-20	---
	15-42	35-42	1.30-1.45	0.2-0.6	0.18-0.20	6.0-8.9	0.0-0.5	.37	.37				4.5-5.5	25-30	0
	42-60	24-38	1.40-1.55	0.2-0.6	0.18-0.20	3.0-5.9	0.0-0.5	.37	.37				5.1-7.3	15-20	0

Table 19.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi- bility group	Wind erodi- bility index	Soil reaction	Cation- exchange capacity	Calcium carbonate
	In	Pct	g/cc	In/hr	In/in	Pct	Pct						pH	meq/100g	Pct
17B:															
Keomah--------	0-6	16-26	1.30-1.40	0.6-2.0	0.22-0.24	0.0-2.9	1.0-2.0	.37	.37	3	6	48	4.5-7.3	15-20	0
	6-11	16-26	1.35-1.45	0.2-0.6	0.18-0.20	0.0-2.9	0.2-1.0	.49	.49				4.5-7.3	15-20	---
	11-60	35-42	1.30-1.45	0.2-0.6	0.18-0.20	6.0-8.9	0.0-0.5	.37	.37				4.5-5.5	25-30	0
19D3:															
Sylvan--------	0-9	27-32	1.25-1.45	0.6-2.0	0.20-0.22	3.0-5.9	0.5-1.0	.37	.37	5	7	38	5.6-7.3	17-21	0
	9-28	25-35	1.30-1.50	0.6-2.0	0.18-0.20	3.0-5.9	0.0-0.5	.37	.37				5.6-7.3	15-22	0
	28-60	10-27	1.30-1.50	0.6-2.0	0.20-0.22	0.0-2.9	0.0-0.5	.37	.37				6.6-8.4	6-18	0-35
37B:															
Worthen-------	0-25	15-22	1.20-1.40	0.6-2.0	0.22-0.24	0.0-2.9	3.0-4.0	.32	.32	5	6	48	5.6-7.3	15-21	0
	25-60	18-24	1.20-1.40	0.6-2.0	0.20-0.22	0.0-2.9	0.2-1.0	.43	.43				5.6-7.8	11-14	0
43A:															
Ipava---------	0-20	20-27	1.15-1.35	0.6-2.0	0.22-0.24	3.0-5.9	4.0-5.0	.28	.28	5	6	48	5.6-7.3	20-27	0
	20-40	35-43	1.25-1.50	0.2-0.6	0.11-0.20	6.0-8.9	0.5-1.0	.37	.37				5.6-7.8	22-27	0
	40-60	20-30	1.30-1.55	0.2-0.6	0.20-0.22	3.0-5.9	0.0-0.5	.43	.43				6.1-8.4	12-19	0
45A:															
Denny---------	0-9	20-27	1.25-1.45	0.6-2.0	0.22-0.24	0.0-2.9	3.0-4.0	.43	.43	5	6	48	5.6-7.3	18-24	0
	9-22	15-22	1.25-1.45	0.2-0.6	0.18-0.20	0.0-2.9	0.0-0.5	.43	.43				5.6-6.5	9-15	0
	22-45	35-45	1.20-1.40	0.06-0.2	0.11-0.22	6.0-8.9	0.0-1.0	.37	.37				5.6-6.5	21-29	0
	45-70	25-35	1.40-1.60	0.2-0.6	0.20-0.22	3.0-5.9	0.0-0.2	.43	.43				5.6-7.8	15-21	0
68A:															
Sable---------	0-17	27-35	1.15-1.35	0.6-2.0	0.21-0.23	3.0-5.9	5.0-6.0	.24	.24	5	7	38	5.6-7.3	26-33	0
	17-23	27-35	1.20-1.40	0.6-2.0	0.18-0.20	3.0-5.9	2.0-4.0	.37	.37				5.6-7.3	20-30	0
	23-60	24-35	1.30-1.50	0.6-2.0	0.18-0.20	3.0-5.9	0.2-1.0	.37	.37				5.6-7.8	15-23	0
75B:															
Drury---------	0-8	10-20	1.20-1.40	0.6-2.0	0.20-0.24	0.0-2.9	1.0-2.0	.43	.43	5	5	56	5.6-8.4	8-16	0-25
	8-35	18-25	1.25-1.45	0.6-2.0	0.20-0.22	0.0-2.9	0.0-0.2	.43	.43				5.6-7.3	11-15	0-10
	35-60	15-20	1.30-1.50	0.6-2.0	0.20-0.22	0.0-2.9	0.0-0.2	.43	.43				6.1-7.8	9-12	0-15
75C2:															
Drury---------	0-6	10-20	1.20-1.40	0.6-2.0	0.20-0.24	0.0-2.9	1.0-2.0	.43	.43	5	5	56	5.6-8.4	8-16	0-25
	6-43	18-25	1.25-1.45	0.6-2.0	0.20-0.22	0.0-2.9	0.0-0.2	.43	.43				5.6-7.3	11-15	0-10
	43-80	15-20	1.30-1.50	0.6-2.0	0.20-0.22	0.0-2.9	0.0-0.2	.43	.43				6.1-7.8	9-12	0-15
86B:															
Osco----------	0-12	20-26	1.25-1.30	0.6-2.0	0.22-0.24	3.0-5.9	3.0-4.0	.28	.28	5	6	48	5.1-7.3	18-25	0
	12-36	24-35	1.30-1.35	0.6-2.0	0.18-0.20	3.0-5.9	0.0-1.0	.37	.37				5.1-6.5	15-23	0
	36-60	20-30	1.35-1.40	0.6-2.0	0.18-0.20	3.0-5.9	0.0-0.5	.37	.37				5.6-7.3	12-18	0

Table 19.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi- bility group	Wind erodi- bility index	Soil reaction	Cation- exchange capacity	Calcium carbonate
	In	Pct	g/cc	In/hr	In/in	Pct	Pct						pH	meq/100g	Pct
86C2:															
Osco----------	0-12	20-26	1.25-1.30	0.6-2.0	0.22-0.24	3.0-5.9	2.0-3.0	.28	.28	5	6	48	5.1-7.3	18-25	0
	12-36	24-35	1.30-1.35	0.6-2.0	0.18-0.20	3.0-5.9	0.0-1.0	.37	.37				5.1-6.5	15-23	0
	36-60	20-30	1.35-1.40	0.6-2.0	0.18-0.20	3.0-5.9	0.0-0.5	.37	.37				5.6-7.3	12-18	0
88B:															
Sparta--------	0-11	3-10	1.20-1.40	2.0-6.0	0.09-0.12	0.0-2.9	1.0-2.0	.15	.15	5	2	134	5.1-7.3	2-12	0
	11-27	1-8	1.40-1.60	6.0-20	0.05-0.11	0.0-2.9	0.1-1.0	.15	.15				5.1-7.3	1-6	0
	27-80	0-5	1.50-1.70	6.0-20	0.04-0.07	0.0-2.9	0.0-0.5	.15	.15				5.1-7.8	1-4	0
102A:															
La Hogue------	0-16	10-27	1.40-1.60	0.6-2.0	0.20-0.24	0.0-2.9	3.0-4.0	.28	.28	5	5	56	5.6-7.8	12-24	0
	16-58	18-35	1.50-1.70	0.6-2.0	0.12-0.20	3.0-5.9	0.5-2.0	.28	.28				5.1-7.3	12-25	0
	58-69	5-20	1.35-1.60	2.0-6.0	0.05-0.22	0.0-2.9	0.5-1.0	.20	.24				5.6-7.8	4-14	0-10
104A:															
Virgil--------	0-9	15-27	1.15-1.35	0.6-2.0	0.20-0.24	0.0-2.9	2.0-3.0	.32	.32	5	6	48	6.1-7.8	13-24	0
	9-15	15-27	1.15-1.35	0.6-2.0	0.22-0.24	0.0-2.9	0.2-0.5	.43	.43				5.1-7.3	9-17	0
	15-41	27-35	1.35-1.55	0.6-2.0	0.18-0.20	3.0-5.9	0.2-1.0	.43	.43				5.1-7.8	16-23	0
	41-63	15-30	1.45-1.75	0.6-6.0	0.05-0.11	0.0-2.9	0.2-0.5	.28	.32				5.6-8.4	9-20	0-20
105B2:															
Batavia-------	0-9	20-27	1.35-1.55	0.6-2.0	0.22-0.25	0.0-2.9	2.0-3.0	.32	.32	5	6	48	5.6-7.3	16-22	0
	9-46	20-35	1.30-1.50	0.6-2.0	0.18-0.20	3.0-5.9	0.0-1.0	.43	.43				5.1-6.5	12-22	0
	46-72	15-30	1.50-1.80	0.6-6.0	0.07-0.11	0.0-2.9	0.0-0.5	.43	.43				5.6-7.3	9-19	0
119D2:															
Elco----------	0-9	20-27	1.20-1.35	0.6-2.0	0.22-0.24	0.0-2.9	1.0-2.0	.43	.43	5	6	48	5.6-7.3	14-22	0
	9-27	23-35	1.25-1.45	0.6-2.0	0.18-0.21	3.0-5.9	0.0-0.5	.37	.37				5.1-7.8	14-22	0
	27-60	23-35	1.40-1.60	0.2-0.6	0.16-0.20	3.0-5.9	0.0-0.2	.28	.28				5.1-7.8	14-21	0
119E2:															
Elco----------	0-5	20-27	1.20-1.35	0.6-2.0	0.22-0.24	0.0-2.9	1.0-2.0	.43	.43	5	6	48	5.6-7.3	14-22	0
	5-25	23-35	1.25-1.45	0.6-2.0	0.18-0.21	3.0-5.9	0.0-0.5	.37	.37				5.1-7.8	14-22	0
	25-60	23-35	1.40-1.60	0.2-0.6	0.16-0.20	3.0-5.9	0.0-0.2	.28	.28				5.1-7.8	14-21	0
134C2:															
Camden--------	0-8	14-27	1.35-1.55	0.6-2.0	0.22-0.24	0.0-2.9	1.0-2.0	.32	.32	5	6	48	5.1-7.3	10-20	0
	8-31	22-35	1.40-1.60	0.6-2.0	0.16-0.20	3.0-5.9	0.1-0.5	.37	.37				5.1-7.3	13-22	0
	31-50	18-30	1.45-1.65	0.6-2.0	0.11-0.17	0.0-2.9	0.0-0.5	.32	.32				5.1-7.3	10-19	0
	50-80	5-20	1.40-1.70	0.6-6.0	0.05-0.15	0.0-2.9	0.0-0.5	.32	.32				5.1-8.4	3-12	0-5
134D2:															
Camden--------	0-6	14-27	1.35-1.55	0.6-2.0	0.21-0.25	0.0-2.9	1.0-2.0	.32	.32	5	6	48	5.1-7.3	10-20	0
	6-26	22-35	1.40-1.60	0.6-2.0	0.14-0.24	3.0-5.9	0.1-0.5	.37	.37				5.1-7.3	13-22	0
	26-40	18-30	1.45-1.65	0.6-2.0	0.11-0.22	0.0-2.9	0.0-0.5	.32	.32				5.1-7.3	10-19	0
	40-60	5-20	1.40-1.70	0.6-6.0	0.12-0.22	0.0-2.9	0.0-0.5	.32	.32				5.1-8.4	3-12	0-5

Table 19.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility (Ksat)	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi-bility group	Wind erodi-bility index	Soil reaction	Cation-exchange capacity	Calcium carbonate
	In	Pct	g/cc	In/hr	In/in	Pct	Pct						pH	meq/100g	Pct
134E2:															
Camden--------	0-11	14-27	1.35-1.55	0.6-2.0	0.22-0.24	0.0-2.9	1.0-2.0	.32	.32	5	6	48	5.1-7.3	10-20	0
	11-37	22-35	1.40-1.60	0.6-2.0	0.16-0.20	3.0-5.9	0.1-0.5	.37	.37				5.1-7.3	13-22	0
	37-49	18-30	1.45-1.65	0.6-2.0	0.11-0.17	0.0-2.9	0.0-0.5	.32	.32				5.1-7.3	10-19	0
	49-64	5-20	1.40-1.70	0.6-6.0	0.10-0.13	0.0-2.9	0.0-0.5	.32	.32				5.1-8.4	3-12	0-5
150B:															
Onarga--------	0-17	8-15	1.15-1.45	0.6-6.0	0.16-0.18	0.0-2.9	2.0-4.0	.20	.20	4	3	86	5.6-7.8	8-16	---
	17-45	15-25	1.45-1.70	0.6-6.0	0.15-0.17	0.0-2.9	0.5-2.0	.20	.20				4.5-7.3	8-10	---
	45-73	2-10	1.65-1.90	6.0-20	0.05-0.10	0.0-2.9	0.5-1.0	.15	.17				5.1-7.3	1-5	---
198A:															
Elburn--------	0-17	22-27	1.10-1.30	0.6-2.0	0.22-0.24	0.0-2.9	4.0-5.0	.24	.24	5	6	48	5.6-7.8	20-30	0
	17-54	25-35	1.20-1.40	0.6-2.0	0.18-0.20	3.0-5.9	0.5-2.0	.43	.43				5.6-7.8	15-25	0
	54-70	15-30	1.50-1.70	0.6-6.0	0.12-0.18	0.0-2.9	0.0-0.2	.43	.43				6.1-8.4	9-15	0-20
199B:															
Plano---------	0-17	18-27	1.10-1.30	0.6-2.0	0.22-0.24	0.0-2.9	3.0-5.0	.24	.24	5	6	48	6.1-7.3	17-26	0
	17-53	25-35	1.20-1.40	0.6-2.0	0.18-0.20	3.0-5.9	0.2-1.0	.43	.43				5.1-7.3	15-23	0
	53-70	10-20	1.50-1.70	0.6-2.0	0.11-0.22	0.0-2.9	0.1-0.5	.37	.37				5.6-8.4	6-13	0-20
242A:															
Kendall-------	0-16	20-27	1.15-1.30	0.6-2.0	0.22-0.24	0.0-2.9	1.0-2.0	.32	.32	5	6	48	5.1-7.3	14-22	0
	16-44	27-35	1.30-1.50	0.6-2.0	0.18-0.20	3.0-5.9	0.0-0.5	.37	.37				4.5-7.3	16-22	0
	44-60	10-25	1.55-1.70	0.6-2.0	0.11-0.22	0.0-2.9	0.0-0.5	.37	.43				5.6-8.4	6-16	0-15
243B:															
St. Charles---	0-8	20-27	1.15-1.30	0.6-2.0	0.22-0.24	0.0-2.9	1.0-3.0	.32	.32	5	6	48	5.1-7.8	14-22	0
	8-70	25-35	1.30-1.50	0.6-2.0	0.18-0.20	3.0-5.9	0.0-0.5	.37	.37				4.5-7.3	15-22	0
	70-80	15-30	1.30-1.50	0.6-2.0	0.14-0.16	0.0-2.9	0.0-0.5	.32	.32				5.1-7.3	9-19	0
257A:															
Clarksdale----	0-7	20-27	1.30-1.50	0.6-2.0	0.22-0.24	3.0-5.9	2.0-3.0	.37	.37	5	6	48	5.1-7.3	10-22	0
	7-13	15-27	1.25-1.50	0.2-0.6	0.20-0.22	0.0-2.9	0.0-1.0	.43	.43				5.1-6.5	9-18	0
	13-42	35-45	1.30-1.50	0.2-0.6	0.16-0.20	6.0-8.9	0.0-0.5	.37	.37				5.1-7.3	21-28	0
	42-60	20-30	1.40-1.60	0.2-0.6	0.20-0.22	3.0-5.9	0.0-0.5	.37	.37				6.1-8.4	12-19	0-15
259C2:															
Assumption----	0-8	20-27	1.25-1.45	0.6-2.0	0.23-0.25	0.0-2.9	2.0-3.0	.28	.28	5	6	48	5.6-7.3	18-24	0
	8-24	25-35	1.20-1.40	0.6-2.0	0.18-0.22	3.0-5.9	0.0-1.0	.37	.37				5.1-7.3	15-23	0
	24-60	25-35	1.40-1.60	0.2-0.6	0.16-0.20	3.0-5.9	0.0-0.5	.28	.28				5.1-7.3	15-22	0
271D2:															
Timula--------	0-20	10-18	1.30-1.60	0.6-2.0	0.20-0.24	0.0-2.9	1.0-2.0	.43	.43	5	5	56	6.1-7.8	8-15	0-5
	20-60	10-18	1.40-1.60	0.6-2.0	0.18-0.20	0.0-2.9	0.2-0.5	.55	.55				7.4-8.4	6-12	5-35

Table 19.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility (Ksat)	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index	Soil reaction	Cation-exchange capacity	Calcium carbonate
	In	Pct	g/cc	In/hr	In/in	Pct	Pct						pH	meq/100g	Pct
274E2:															
Seaton--------	0-6	15-22	1.10-1.20	0.6-2.0	0.22-0.24	0.0-2.9	1.0-3.0	.43	.43	5	5	56	5.6-7.3	11-19	0
	6-47	18-27	1.15-1.30	0.6-2.0	0.20-0.22	0.0-2.9	0.5-1.0	.49	.49				4.5-7.3	11-16	0
	47-60	15-25	1.20-1.40	0.6-2.0	0.20-0.22	0.0-2.9	0.2-0.5	.49	.49				5.6-8.4	9-15	0-25
274F:															
Seaton--------	0-9	10-22	1.10-1.45	0.6-2.0	0.22-0.24	0.0-2.9	1.0-3.0	.43	.43	5	5	56	5.6-7.3	8-19	0
	9-58	18-27	1.20-1.60	0.6-2.0	0.20-0.22	0.0-2.9	0.5-1.0	.49	.49				4.5-7.3	11-16	0
	58-80	10-25	1.20-1.50	0.6-2.0	0.20-0.22	0.0-2.9	0.2-0.5	.49	.49				5.6-8.4	6-15	0-35
274G:															
Seaton--------	0-8	10-22	1.10-1.45	0.6-2.0	0.22-0.24	0.0-2.9	1.0-3.0	.43	.43	5	5	56	5.6-7.3	8-19	0
	8-46	18-27	1.20-1.60	0.6-2.0	0.20-0.22	0.0-2.9	0.5-1.0	.49	.49				4.5-7.3	11-16	0
	46-60	10-25	1.20-1.50	0.6-2.0	0.20-0.22	0.0-2.9	0.2-0.5	.49	.49				5.6-8.4	6-15	0-35
279B:															
Rozetta-------	0-7	15-27	1.20-1.40	0.6-2.0	0.22-0.24	0.0-2.9	1.0-3.0	.43	.43	5	6	48	5.1-7.3	10-22	0
	7-11	12-27	1.20-1.40	0.6-2.0	0.22-0.24	0.0-2.9	0.2-0.5	.49	.49				4.5-7.3	7-17	0
	11-55	27-35	1.35-1.55	0.6-2.0	0.18-0.22	3.0-5.9	0.2-0.5	.37	.37				4.5-6.0	16-22	0
	55-60	20-30	1.40-1.60	0.6-2.0	0.20-0.22	0.0-2.9	0.2-0.5	.49	.49				5.6-7.8	12-17	0-15
279C2:															
Rozetta-------	0-8	15-27	1.20-1.40	0.6-2.0	0.22-0.24	0.0-2.9	1.0-2.0	.43	.43	5	6	48	5.1-7.3	10-22	0
	8-13	12-27	1.20-1.40	0.6-2.0	0.22-0.24	0.0-2.9	0.2-0.5	.37	.37				4.5-7.3	7-17	0
	13-56	27-35	1.35-1.55	0.6-2.0	0.18-0.22	3.0-5.9	0.2-0.5	.37	.37				4.5-6.0	16-22	0
	56-80	20-30	1.40-1.60	0.6-2.0	0.18-0.22	0.0-2.9	0.2-0.5	.49	.49				5.6-7.8	12-17	0-15
279C3:															
Rozetta-------	0-6	27-35	1.30-1.45	0.6-2.0	0.18-0.22	3.0-5.9	0.5-1.0	.37	.37	5	7	38	5.1-7.3	7-17	---
	6-33	27-35	1.35-1.50	0.6-2.0	0.18-0.20	3.0-5.9	0.2-0.5	.43	.43				4.5-6.5	16-22	---
	33-60	15-27	1.40-1.60	0.6-2.0	0.20-0.22	0.0-2.9	0.2-0.5	.49	.49				5.6-7.8	12-17	---
280B2:															
Fayette-------	0-8	25-27	1.35-1.45	0.6-2.0	0.18-0.20	3.0-5.9	1.0-2.0	.43	.43	5	6	48	5.1-7.3	18-25	0
	8-56	25-35	1.30-1.45	0.6-2.0	0.18-0.20	3.0-5.9	0.0-0.5	.37	.37				4.5-6.0	15-20	0
	56-80	22-26	1.45-1.50	0.6-2.0	0.18-0.20	3.0-5.9	0.0-0.5	.49	.49				5.1-7.8	15-20	0-15
280C2:															
Fayette-------	0-8	25-27	1.35-1.45	0.6-2.0	0.18-0.20	3.0-5.9	1.0-2.0	.43	.43	5	6	48	5.1-7.3	18-25	0
	8-64	25-35	1.30-1.45	0.6-2.0	0.18-0.20	3.0-5.9	0.0-0.5	.37	.37				4.5-6.0	15-20	0
	64-80	22-26	1.45-1.50	0.6-2.0	0.18-0.20	3.0-5.9	0.0-0.5	.49	.49				5.1-7.8	15-20	0-15
280D2:															
Fayette-------	0-6	25-27	1.35-1.45	0.6-2.0	0.18-0.20	3.0-5.9	1.0-2.0	.43	.43	5	6	48	5.1-7.3	18-25	0
	6-48	25-35	1.30-1.45	0.6-2.0	0.18-0.20	3.0-5.9	0.0-0.5	.37	.37				4.5-6.0	15-20	0
	48-60	22-26	1.45-1.50	0.6-2.0	0.18-0.20	3.0-5.9	0.0-0.5	.49	.49				5.1-7.8	15-20	0-15

Table 19.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility (Ksat)	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi-bility group	Wind erodi-bility index	Soil reaction	Cation-exchange capacity	Calcium carbonate
	In	Pct	g/cc	In/hr	In/in	Pct	Pct						pH	meq/100g	Pct
280E2:															
Fayette-------	0-4	25-27	1.35-1.45	0.6-2.0	0.18-0.20	3.0-5.9	1.0-2.0	.43	.43	5	6	48	5.1-7.3	18-25	0
	4-60	25-35	1.30-1.45	0.6-2.0	0.18-0.20	3.0-5.9	0.0-0.5	.37	.37				4.5-6.0	15-20	0
	60-77	22-26	1.45-1.50	0.6-2.0	0.18-0.20	3.0-5.9	0.0-0.5	.49	.49				5.1-7.8	15-20	0-15
379A:															
Dakota--------	0-20	14-27	1.40-1.50	0.6-2.0	0.20-0.22	0.0-2.9	2.0-5.0	.24	.24	4	5	56	5.1-7.3	7-30	0
	20-27	18-32	1.30-1.55	0.6-2.0	0.15-0.19	0.0-2.9	0.5-2.0	.32	.32				5.1-7.3	5-30	0
	27-52	4-11	1.55-1.65	2.0-6.0	0.02-0.14	0.0-2.9	0.0-0.5	.20	.24				5.1-7.3	1-10	0
	52-70	1-4	1.55-1.65	6.0-20	0.02-0.10	0.0-2.9	0.0-0.5	.15	.15				5.1-7.8	0-4	0-15
379B:															
Dakota--------	0-16	14-27	1.40-1.50	0.6-2.0	0.20-0.22	0.0-2.9	2.0-5.0	.24	.24	4	5	56	5.1-7.3	7-30	0
	16-22	18-32	1.30-1.55	0.6-2.0	0.15-0.19	0.0-2.9	0.5-2.0	.32	.32				5.1-7.3	5-30	0
	22-48	4-11	1.55-1.65	2.0-6.0	0.02-0.14	0.0-2.9	0.0-0.5	.20	.24				5.1-7.3	1-10	0
	48-80	1-4	1.55-1.65	6.0-20	0.02-0.10	0.0-2.9	0.0-0.5	.15	.15				5.1-7.8	0-4	0-15
430B:															
Raddle--------	0-13	18-24	1.20-1.40	0.6-2.0	0.22-0.24	0.0-2.9	2.0-4.0	.32	.32	5	6	48	5.6-7.3	11-22	0
	13-60	18-24	1.20-1.40	0.6-2.0	0.20-0.22	0.0-2.9	0.5-2.0	.49	.49				5.6-7.3	12-18	0
536:															
Dumps, mine.															
549F:															
Marseilles----	0-9	20-27	1.20-1.40	0.6-2.0	0.20-0.24	0.0-2.9	1.0-2.0	.37	.37	3	6	48	5.1-6.5	14-22	0
	9-43	27-42	1.35-1.60	0.06-0.2	0.16-0.20	3.0-5.9	0.0-1.0	.37	.37				4.5-6.5	16-27	0
	43-60	---	---	0.01-0.2	---	---	---	---	---				---	---	---
549G:															
Marseilles----	0-4	20-27	1.20-1.40	0.6-2.0	0.20-0.24	0.0-2.9	1.0-2.0	.37	.37	3	6	48	5.1-6.5	14-22	0
	4-32	27-42	1.35-1.60	0.06-0.2	0.09-0.20	3.0-5.9	0.0-1.0	.37	.37				4.5-6.5	16-27	0
	32-60	---	---	0.01-0.2	---	---	---	---	---				---	---	---
558A:															
Breeds--------	0-16	27-35	1.10-1.30	0.6-2.0	0.22-0.24	0.0-2.9	2.0-4.0	.24	.24	4	6	48	5.1-7.3	20-29	---
	16-40	25-30	1.20-1.40	0.6-2.0	0.18-0.20	3.0-5.9	0.5-2.0	.37	.37				5.6-7.8	16-25	---
	40-46	20-30	1.40-1.60	0.6-6.0	0.12-0.18	0.0-2.9	0.0-0.5	.24	.24				6.1-7.8	12-19	---
	46-60	---	---	---	---	---	---	---	---				---	---	---
567B2:															
Elkhart-------	0-8	27-35	1.20-1.40	0.6-2.0	0.20-0.22	3.0-5.9	2.0-3.0	.24	.24	5	7	38	5.6-7.8	18-27	0
	8-32	25-35	1.25-1.45	0.6-2.0	0.18-0.20	3.0-5.9	0.0-0.5	.37	.37				5.6-8.4	15-22	0-20
	32-60	10-27	1.35-1.55	0.6-2.0	0.20-0.22	0.0-2.9	0.0-0.1	.49	.49				7.4-8.4	12-21	10-40

Table 19.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi- bility group	Wind erodi- bility index	Soil reaction	Cation- exchange capacity	Calcium carbonate
	In	Pct	g/cc	In/hr	In/in	Pct	Pct						pH	meq/100g	Pct
567C2:															
Elkhart-------	0-8	27-35	1.20-1.40	0.6-2.0	0.20-0.22	3.0-5.9	2.0-3.0	.24	.24	5	7	38	5.6-7.8	18-27	0
	8-32	25-35	1.25-1.45	0.6-2.0	0.18-0.20	3.0-5.9	0.0-0.5	.37	.37				5.6-8.4	15-22	0-20
	32-60	20-27	1.35-1.55	0.6-2.0	0.20-0.22	0.0-2.9	0.0-0.1	.49	.49				7.4-8.4	12-21	10-40
570B:															
Martinsville--	0-11	8-20	1.30-1.45	0.6-2.0	0.20-0.24	0.0-2.9	1.0-2.0	.37	.37	5	5	56	5.1-7.3	5-16	0
	11-37	20-33	1.40-1.60	0.6-2.0	0.16-0.20	3.0-5.9	0.0-0.5	.37	.37				5.1-6.5	8-21	0
	37-60	15-25	1.40-1.60	0.6-2.0	0.12-0.17	0.0-2.9	0.0-0.2	.24	.24				5.1-6.5	6-15	0
596B:															
Marbletown----	0-14	18-24	1.20-1.40	0.6-2.0	0.22-0.24	0.0-2.9	2.0-4.0	.32	.32	4	6	48	6.1-7.8	15-22	---
	14-31	18-24	1.20-1.40	0.6-2.0	0.20-0.22	3.0-5.9	1.0-3.0	.49	.49				6.1-7.8	13-20	---
	31-50	24-35	1.45-1.65	0.6-2.0	0.15-0.19	3.0-5.9	1.0-2.0	.24	.24				6.6-8.4	16-25	---
	50-60	---	---	---	---	---	---	---	---				---	---	---
630C3:															
Navlys--------	0-6	27-32	1.25-1.45	0.6-2.0	0.20-0.22	3.0-5.9	0.5-1.0	.49	.49	5	7	38	5.6-7.3	16-20	0
	6-31	25-35	1.30-1.50	0.6-2.0	0.18-0.20	3.0-5.9	0.2-1.0	.37	.37				5.6-7.3	15-23	0
	31-60	18-27	1.30-1.50	0.6-2.0	0.20-0.22	0.0-2.9	0.2-0.5	.37	.37				6.6-8.4	11-17	0-35
632A:															
Copperas------	0-16	27-35	1.10-1.30	0.2-0.6	0.21-0.23	3.0-5.9	3.0-5.0	.28	.28	4	7	38	6.1-7.8	22-31	---
	16-54	25-35	1.20-1.45	0.2-0.6	0.18-0.20	3.0-5.9	0.0-1.0	.24	.24				6.6-8.4	16-23	---
	54-63	---	---	---	---	---	---	---	---				---	---	---
675B:															
Greenbush-----	0-9	18-27	1.25-1.30	0.6-2.0	0.21-0.23	0.0-2.9	2.0-3.0	.28	.28	5	6	48	5.1-7.3	20-25	0
	9-14	27-35	1.30-1.35	0.6-2.0	0.18-0.20	3.0-5.9	0.5-1.0	.37	.37				5.1-6.5	25-30	0
	14-60	15-25	1.35-1.45	0.6-2.0	0.18-0.20	3.0-5.9	0.0-0.5	.37	.37				5.1-6.5	20-25	0
779B:															
Chelsea-------	0-13	8-15	1.50-1.55	6.0-20	0.10-0.15	0.0-2.9	0.5-1.0	.15	.15	5	2	134	5.6-7.3	5-10	0
	13-60	5-10	1.55-1.70	6.0-20	0.06-0.08	0.0-2.9	0.0-0.5	.15	.15				5.1-6.5	5-10	0
779D:															
Chelsea-------	0-13	8-15	1.50-1.55	6.0-20	0.10-0.15	0.0-2.9	0.5-1.0	.15	.15	5	2	134	5.6-7.3	5-10	0
	13-60	5-10	1.55-1.70	6.0-20	0.06-0.12	0.0-2.9	0.0-0.5	.15	.15				5.1-6.5	5-10	0
801B:															
Orthents------	0-80	20-35	1.35-1.55	0.2-2.0	0.18-0.22	3.0-5.9	0.2-1.0	.43	.43	5	6	48	5.1-7.8	10-25	0-10
823B:															
Schuline------	0-6	27-35	1.30-1.60	0.6-2.0	0.18-0.21	3.0-5.9	0.5-1.0	.37	.37	3	7	38	5.6-8.4	17-25	0-20
	6-60	18-35	1.60-1.80	0.06-0.2	0.08-0.12	3.0-5.9	0.2-0.5	.37	.37				7.4-8.4	11-22	5-35

Table 19.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi- bility group	Wind erodi- bility index	Soil reaction	Cation- exchange capacity	Calcium carbonate
	In	Pct	g/cc	In/hr	In/in	Pct	Pct						pH	meq/100g	Pct
823D:															
Schuline------	0-5	27-35	1.30-1.60	0.6-2.0	0.18-0.21	3.0-5.9	0.5-1.0	.37	.37	3	7	38	5.6-8.4	17-25	0-20
	5-60	18-35	1.60-1.80	0.06-0.2	0.08-0.12	3.0-5.9	0.2-0.5	.37	.37				7.4-8.4	11-22	5-35
865:															
Pits, gravel.															
871B:															
Lenzburg------	0-5	20-27	1.30-1.60	0.6-2.0	0.17-0.20	3.0-5.9	0.5-2.0	.37	.43	5	4L	86	6.6-8.4	13-24	0-20
	5-37	20-35	1.30-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.2-1.0	.37	.43				6.6-8.4	12-23	0-25
	37-80	20-35	1.40-1.70	0.2-0.6	0.11-0.17	3.0-5.9	0.2-1.0	.32	.43				7.4-8.4	12-23	0-25
871D:															
Lenzburg------	0-5	27-35	1.30-1.60	0.6-2.0	0.17-0.22	3.0-5.9	0.5-1.0	.37	.37	5	4L	86	6.6-8.4	17-29	0-20
	5-8	20-35	1.30-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.2-1.0	.37	.43				6.6-8.4	12-23	0-25
	8-60	20-35	1.40-1.70	0.2-0.6	0.11-0.17	3.0-5.9	0.2-1.0	.32	.43				7.4-8.4	12-23	0-25
871G:															
Lenzburg------	0-4	27-35	1.30-1.60	0.6-2.0	0.17-0.22	3.0-5.9	0.5-1.0	.37	.37	5	4L	86	6.6-8.4	17-29	0-20
	4-14	20-35	1.30-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.2-1.0	.32	.43				6.6-8.4	12-23	0-25
	14-60	20-35	1.40-1.70	0.2-0.6	0.11-0.17	3.0-5.9	0.2-1.0	.28	.43				7.4-8.4	12-23	0-25
872B:															
Rapatee-------	0-5	27-30	1.40-1.60	0.2-0.6	0.15-0.20	0.0-2.9	3.0-5.0	.37	.37	5	6	48	6.1-7.3	18-24	---
	5-50	15-35	1.50-1.90	0.06-0.6	0.08-0.15	3.0-5.9	0.5-1.0	.37	.43				6.6-8.4	9-20	---
	50-80	15-35	1.55-2.20	0.00-0.06	0.03-0.18	0.0-2.9	0.0-0.5	.37	.37				6.6-8.4	8-19	---
876B:															
Lenzwheel-----	0-19	15-27	1.30-1.50	0.2-0.6	0.20-0.23	0.0-2.9	0.5-1.0	.37	.37	5	4L	86	6.1-7.8	10-20	---
	19-80	18-35	1.55-1.90	0.2-0.6	0.03-0.10	0.0-2.9	0.2-1.0	.37	.43				6.6-8.4	11-22	---
876D:															
Lenzwheel-----	0-30	27-35	1.30-1.60	0.2-0.6	0.18-0.21	3.0-5.9	0.5-1.0	.37	.37	5	7	38	6.1-7.8	17-25	---
	30-80	18-35	1.55-1.90	0.2-0.6	0.03-0.10	0.0-2.9	0.2-1.0	.37	.43				6.6-8.4	11-22	---
876G:															
Lenzwheel-----	0-7	27-35	1.30-1.60	0.2-0.6	0.18-0.21	3.0-5.9	0.5-1.0	.37	.37	5	7	38	6.1-7.8	17-25	---
	7-80	18-35	1.55-1.90	0.2-0.6	0.03-0.10	0.0-2.9	0.2-1.0	.37	.43				6.6-8.4	11-22	---
3070A:															
Beaucoup------	0-19	27-35	1.15-1.35	0.2-0.6	0.15-0.23	3.0-5.9	5.0-6.0	.28	.28	5	7	38	5.6-7.8	26-33	0
	19-42	27-35	1.30-1.50	0.2-0.6	0.18-0.20	3.0-5.9	0.0-2.0	.32	.32				5.6-7.8	16-25	0
	42-65	15-30	1.35-1.55	0.2-0.6	0.18-0.22	3.0-5.9	0.0-1.0	.32	.32				5.6-7.8	9-20	0-5

Table 19.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility (Ksat)	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi-bility group	Wind erodi-bility index	Soil reaction	Cation-exchange capacity	Calcium carbonate
	In	Pct	g/cc	In/hr	In/in	Pct	Pct						pH	meq/100g	Pct
3074A:															
Radford-------	0-15	18-27	1.40-1.60	0.6-2.0	0.22-0.24	0.0-2.9	2.0-4.0	.32	.32	5	6	48	5.6-7.8	13-22	---
	15-24	18-27	1.40-1.60	0.6-2.0	0.20-0.22	0.0-2.9	0.0-2.0	.49	.49				6.1-7.8	10-16	---
	24-60	24-35	1.35-1.55	0.6-2.0	0.18-0.20	3.0-5.9	1.0-3.0	.32	.32				6.6-7.8	12-19	---
3077A:															
Huntsville----	0-43	18-27	1.15-1.35	0.6-2.0	0.22-0.24	3.0-5.9	3.0-4.0	.32	.32	5	6	48	5.6-7.8	17-24	0
	43-60	18-27	1.20-1.40	0.6-2.0	0.20-0.22	3.0-5.9	0.2-0.5	.49	.49				5.6-7.8	11-17	0
3107A:															
Sawmill-------	0-26	27-35	1.20-1.40	0.6-2.0	0.21-0.23	3.0-5.9	4.0-5.0	.28	.28	5	7	38	6.1-7.8	24-31	0
	26-54	27-35	1.20-1.40	0.6-2.0	0.17-0.20	3.0-5.9	1.0-3.0	.32	.32				6.1-7.8	17-27	0
	54-60	25-35	1.30-1.45	0.6-2.0	0.17-0.20	3.0-5.9	0.0-2.0	.32	.32				6.1-7.8	16-25	0-10
3284A:															
Tice----------	0-14	27-35	1.25-1.45	0.6-2.0	0.21-0.24	3.0-5.9	2.0-3.0	.32	.32	5	7	38	6.1-7.8	20-27	0
	14-52	24-35	1.30-1.50	0.6-2.0	0.18-0.20	3.0-5.9	0.0-1.0	.32	.32				5.6-7.8	16-23	0
	52-72	15-30	1.40-1.60	0.6-2.0	0.11-0.18	3.0-5.9	0.0-1.0	.49	.49				5.6-7.8	9-20	0-20
3333A:															
Wakeland------	0-8	10-18	1.30-1.50	0.6-2.0	0.20-0.24	0.0-2.9	1.0-3.0	.43	.43	5	5	56	5.6-7.3	4-12	0
	8-80	10-18	1.30-1.50	0.6-2.0	0.20-0.24	0.0-2.9	0.0-1.0	.55	.55				5.6-7.8	4-12	0
3404A:															
Titus---------	0-16	40-45	1.30-1.50	0.06-0.2	0.11-0.18	6.0-8.9	2.0-4.0	.24	.24	5	4	86	6.1-7.3	28-35	0
	16-64	35-45	1.30-1.60	0.06-0.2	0.11-0.22	6.0-8.9	0.2-1.0	.32	.32				6.1-7.8	21-29	0
	64-72	20-30	1.45-1.75	0.2-0.6	0.10-0.20	3.0-5.9	0.2-0.5	.32	.32				6.1-7.8	12-19	0-5
3415A:															
Orion---------	0-7	10-18	1.20-1.30	0.6-2.0	0.22-0.24	0.0-2.9	1.0-3.0	.43	.43	5	5	56	5.6-7.8	7-20	0
	7-22	10-18	1.20-1.30	0.6-2.0	0.20-0.22	0.0-2.9	1.0-3.0	.49	.49				5.6-7.8	7-20	0
	22-60	10-30	1.25-1.45	0.6-2.0	0.18-0.22	0.0-2.9	3.0-8.0	.43	.43				5.6-7.8	10-35	0
	60-80	10-18	1.20-1.40	0.6-2.0	0.18-0.22	0.0-2.9	0.0-0.5	.55	.55				5.6-7.8	5-15	0
3451A:															
Lawson--------	0-9	10-27	1.20-1.55	0.6-2.0	0.22-0.24	0.0-2.9	3.0-7.0	.32	.32	5	5	56	6.1-7.8	11-28	0
	9-29	10-30	1.20-1.55	0.6-2.0	0.18-0.22	0.0-2.9	3.0-7.0	.32	.32				6.1-7.8	11-29	0
	29-46	18-30	1.55-1.65	0.6-2.0	0.18-0.20	3.0-5.9	1.0-4.0	.49	.49				6.1-7.8	11-23	0
	46-80	18-30	1.50-1.70	0.6-2.0	0.11-0.15	3.0-5.9	0.1-1.0	.49	.49				6.1-7.8	9-17	0
3634A:															
Blyton--------	0-10	10-18	1.30-1.50	0.6-2.0	0.20-0.24	0.0-2.9	1.0-3.0	.43	.43	5	5	56	5.6-7.3	4-16	0
	10-80	10-18	1.30-1.50	0.6-2.0	0.20-0.24	0.0-2.9	0.5-2.0	.55	.55				5.6-7.8	4-15	0
3641L:															
Quiver--------	0-9	27-35	1.15-1.35	0.2-0.6	0.15-0.20	3.0-5.9	3.0-4.0	.28	.28	5	7	38	5.6-7.8	22-29	---
	9-65	20-35	1.40-1.50	0.2-0.6	0.18-0.22	0.3-5.9	0.0-1.0	.32	.32				6.6-8.4	12-23	---

Table 19.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility (Ksat)	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi-bility group	Wind erodi-bility index	Soil reaction	Cation-exchange capacity	Calcium carbonate
	In	Pct	g/cc	In/hr	In/in	Pct	Pct						pH	meq/100g	Pct
7081A:															
Littleton-----	0-9	18-27	1.20-1.45	0.6-2.0	0.20-0.24	0.0-2.9	3.0-4.0	.32	.32	5	6	48	5.6-7.8	15-22	---
	9-46	22-27	1.20-1.40	0.6-2.0	0.22-0.24	0.0-2.9	2.0-4.0	.32	.32				5.6-7.8	11-14	---
	46-80	18-27	1.20-1.40	0.6-2.0	0.20-0.22	0.0-2.9	0.0-1.0	.49	.49				5.6-7.8	9-14	---
8070A:															
Beaucoup------	0-17	27-35	1.15-1.35	0.2-0.6	0.15-0.20	3.0-5.9	5.0-6.0	.32	.32	5	7	38	5.6-7.8	26-33	0
	17-60	27-35	1.30-1.50	0.2-0.6	0.18-0.20	3.0-5.9	0.0-2.0	.32	.32				5.6-7.8	16-25	0
8092B:															
Sarpy---------	0-6	2-5	1.20-1.50	6.0-20	0.05-0.09	0.0-2.9	0.5-1.0	.02	.02	5	1	250	6.6-8.4	2-8	0-15
	6-80	2-5	1.20-1.50	6.0-20	0.05-0.09	0.0-2.9	0.0-0.5	.02	.02				7.4-8.4	2-8	5-15
8183A:															
Shaffton------	0-12	27-30	1.45-1.55	0.6-2.0	0.20-0.22	3.0-5.9	2.0-3.0	.28	.28	5	6	48	5.1-7.3	25-30	0
	12-32	18-26	1.55-1.65	0.6-2.0	0.17-0.19	3.0-5.9	1.0-3.0	.28	.28				4.5-6.0	20-25	0
	32-36	8-16	1.40-1.60	6.0-20	0.15-0.17	0.0-2.9	0.0-0.5	.17	.17				4.5-6.0	10-15	0
	36-51	28-32	1.60-1.70	2.0-6.0	0.11-0.13	3.0-5.9	0.0-0.5	.43	.43				5.1-6.5	25-30	0
	51-60	2-6	1.65-1.75	6.0-20	0.05-0.07	0.0-2.9	0.0-0.5	.15	.15				6.1-7.3	5-10	0
8284A:															
Tice----------	0-14	27-35	1.25-1.45	0.6-2.0	0.21-0.24	3.0-5.9	2.0-3.0	.28	.28	5	7	38	6.1-7.8	20-27	0
	14-42	24-35	1.30-1.50	0.6-2.0	0.18-0.20	3.0-5.9	0.0-1.0	.32	.32				5.6-7.8	16-23	0
	42-60	15-30	1.40-1.60	0.6-2.0	0.18-0.20	3.0-5.9	0.0-1.0	.49	.49				5.6-7.8	9-20	0-20
8302A:															
Ambraw--------	0-16	18-35	1.30-1.55	0.6-2.0	0.15-0.22	3.0-5.9	2.0-3.0	.24	.24	5	6	48	5.6-7.3	15-27	0
	16-33	25-42	1.30-1.55	0.2-0.6	0.08-0.19	3.0-5.9	0.5-2.0	.28	.28				5.1-7.3	19-29	0
	33-41	24-35	1.40-1.65	0.2-2.0	0.10-0.15	3.0-5.9	0.5-1.0	.28	.28				5.1-7.3	15-23	0
	41-70	18-30	1.35-1.65	0.2-2.0	0.11-0.22	0.0-2.9	0.5-1.0	.28	.28				5.6-8.4	11-19	0
8404A:															
Titus---------	0-15	40-45	1.30-1.50	0.06-0.2	0.11-0.18	6.0-8.9	2.0-4.0	.24	.24	5	4	86	6.1-7.3	28-35	0
	15-51	35-45	1.30-1.60	0.06-0.2	0.11-0.22	6.0-8.9	0.2-1.0	.32	.32				6.1-7.8	21-29	0
	51-60	20-30	1.45-1.75	0.2-0.6	0.10-0.20	3.0-5.9	0.2-0.5	.32	.32				6.1-7.8	12-19	0-5
8415A:															
Orion---------	0-6	10-18	1.20-1.30	0.6-2.0	0.22-0.24	0.0-2.9	1.0-3.0	.37	.37	5	5	56	5.6-7.8	7-20	0
	6-25	10-18	1.20-1.30	0.6-2.0	0.20-0.22	0.0-2.9	1.0-3.0	.37	.37				5.6-7.8	7-20	0
	25-60	10-30	1.25-1.45	0.6-2.0	0.18-0.22	0.0-2.9	3.0-8.0	.37	.37				5.6-7.8	10-35	0
8595A:															
Coot----------	0-15	18-22	1.35-1.55	0.6-2.0	0.20-0.24	0.0-2.9	3.0-5.0	.28	.28	3	5	56	6.1-7.3	17-23	---
	15-22	25-35	1.35-1.55	0.6-2.0	0.15-0.20	3.0-5.9	0.5-2.0	.28	.28				6.1-7.3	16-25	---
	22-31	18-30	1.40-1.65	0.6-2.0	0.13-0.16	0.0-2.9	0.5-2.0	.24	.28				6.1-8.4	12-22	---
	31-41	1-10	1.90-2.20	6.0-20	0.02-0.04	0.0-2.9	0.0-0.2	.10	.10				6.6-8.4	1-10	---
	41-60	---	---	---	---	---	---	---	---				---	---	---

Table 19.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi- bility group	Wind erodi- bility index	Soil reaction	Cation- exchange capacity	Calcium carbonate
	In	Pct	g/cc	In/hr	In/in	Pct	Pct						pH	meq/100g	Pct
8608A:															
Mudhen--------	0-12	27-33	1.20-1.35	0.6-2.0	0.17-0.23	3.0-5.9	5.0-6.0	.28	.28	3	6	48	6.1-7.3	26-32	---
	12-23	25-33	1.35-1.55	0.6-2.0	0.15-0.20	3.0-5.9	0.5-2.0	.28	.28				6.1-8.4	16-24	---
	23-28	18-30	1.40-1.65	0.6-2.0	0.13-0.16	0.0-2.9	0.5-2.0	.24	.28				6.1-8.4	12-22	---
	28-41	1-10	1.90-2.20	6.0-20	0.02-0.04	0.0-2.9	0.0-0.2	.10	.10				6.6-8.4	1-6	---
	41-60	---	---	---	---	---	---	---	---				---	---	---
8611A:															
Sepo----------	0-19	27-35	1.05-1.25	0.2-0.6	0.15-0.20	3.0-5.9	2.0-4.0	.28	.28	5	7	38	6.1-7.8	20-29	---
	19-42	27-35	1.30-1.50	0.2-0.6	0.18-0.20	3.0-5.9	0.0-2.0	.32	.32				6.6-8.4	16-25	---
	42-70	18-30	1.35-1.45	0.2-0.6	0.20-0.22	3.0-5.9	0.0-1.0	.32	.32				6.6-8.4	11-20	---
8875B:															
Lenzlo--------	0-3	27-35	1.30-1.60	0.2-0.6	0.17-0.22	3.0-5.9	0.5-4.0	.37	.43	5	4L	86	6.6-7.8	17-29	---
	3-80	20-35	1.30-1.60	0.2-0.6	0.15-0.18	3.0-5.9	0.2-1.0	.32	.43				6.6-8.4	12-23	---
9017A:															
Keomah--------	0-9	16-26	1.30-1.40	0.6-2.0	0.22-0.24	0.0-2.9	1.0-2.0	.32	.32	3	6	48	4.5-7.3	15-20	0
	9-16	16-26	1.35-1.45	0.2-0.6	0.18-0.20	0.0-2.9	0.2-1.0	.49	.49				4.5-7.3	15-20	---
	16-49	35-42	1.30-1.45	0.06-0.6	0.18-0.20	6.0-8.9	0.0-0.5	.37	.37				4.5-5.5	25-30	0
	49-80	24-38	1.40-1.55	0.2-0.6	0.18-0.20	3.0-5.9	0.0-0.5	.37	.37				5.1-7.3	15-20	0
9068A:															
Sable---------	0-13	27-35	1.15-1.35	0.6-2.0	0.21-0.23	3.0-5.9	5.0-6.0	.24	.24	5	7	38	5.6-7.3	26-33	0
	13-19	27-35	1.20-1.40	0.6-2.0	0.18-0.20	3.0-5.9	2.0-4.0	.37	.37				5.6-7.3	20-30	0
	19-55	24-35	1.30-1.50	0.6-2.0	0.18-0.20	3.0-5.9	0.2-1.0	.37	.37				5.6-7.8	15-23	0
	55-80	20-28	1.30-1.50	0.6-2.0	0.20-0.22	0.0-2.9	0.2-0.5	.28	.28				6.6-8.4	12-18	0-30
9257A:															
Clarksdale----	0-10	20-27	1.30-1.50	0.6-2.0	0.22-0.25	3.0-5.9	2.0-3.0	.28	.28	5	6	48	5.1-7.3	10-22	0
	10-16	15-27	1.25-1.50	0.2-0.6	0.20-0.22	0.0-2.9	0.0-1.0	.43	.43				5.1-6.5	9-18	0
	16-46	35-45	1.30-1.50	0.2-0.6	0.11-0.20	6.0-8.9	0.0-0.5	.37	.37				5.1-7.3	21-28	0
	46-80	20-30	1.40-1.60	0.2-0.6	0.20-0.22	3.0-5.9	0.0-0.5	.37	.37				6.1-8.4	12-19	0-15
9279B:															
Rozetta-------	0-9	15-27	1.20-1.40	0.6-2.0	0.22-0.24	0.0-2.9	1.0-3.0	.32	.32	5	6	48	5.1-7.3	10-22	0
	9-66	27-35	1.35-1.55	0.6-2.0	0.18-0.22	3.0-5.9	0.2-0.5	.37	.37				4.5-6.0	16-22	0
	66-76	20-30	1.40-1.60	0.6-2.0	0.20-0.22	0.0-2.9	0.2-0.5	.37	.37				5.6-7.8	12-17	0-15
9279C:															
Rozetta-------	0-7	15-27	1.20-1.40	0.6-2.0	0.22-0.24	0.0-2.9	1.0-2.0	.43	.43	5	6	48	5.1-7.3	10-22	0
	7-66	27-35	1.35-1.55	0.6-2.0	0.18-0.22	3.0-5.9	0.2-0.5	.37	.37				4.5-6.0	16-22	0
	66-70	20-30	1.40-1.60	0.6-2.0	0.20-0.22	0.0-2.9	0.2-0.5	.37	.37				5.6-7.8	12-17	0-15

Table 20.--Water Features

(See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
7C3:									
Atlas	D								
		Jan-May	0.5-1.5	1.0-2.5	---	---	None	---	None.
7D3:									
Atlas	D								
		Jan-May	0.5-1.5	1.0-2.5	---	---	None	---	None.
8D2:									
Hickory	C								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.
8E2:									
Hickory	C								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.
8F:									
Hickory	C								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.
8G:									
Hickory	C								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.
16A:									
Rushville	D								
		Jan-May	0.0-1.0	>6.0	0.0-0.5	Brief	Frequent	---	None.
17A:									
Keomah	C								
		Jan-May	0.5-2.0	>6.0	---	---	None	---	None.
17B:									
Keomah	C								
		Jan-May	0.5-2.0	>6.0	---	---	None	---	None.
19D3:									
Sylvan	B								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.
37B:									
Worthen	B								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.
43A:									
Ipava	B								
		Jan-May	1.0-2.0	>6.0	---	---	None	---	None.
45A:									
Denny	D								
		Jan-May	0.0-1.0	>6.0	0.0-1.0	Brief	Frequent	---	None.
68A:									
Sable	B/D								
		Jan-May	0.0-1.0	>6.0	0.0-0.5	Brief	Frequent	---	None.

Table 20.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
75B:									
Drury	B								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.
75C2:									
Drury	B								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.
86B:									
Osco	B								
		Feb-April	4.0-6.0	>6.0	---	---	None	---	None.
86C2:									
Osco	B								
		Feb-April	4.0-6.0	>6.0	---	---	None	---	None.
88B:									
Sparta	A								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.
102A:									
La Hogue	B								
		Jan-May	1.0-2.0	>6.0	---	---	None	---	None.
104A:									
Virgil	B								
		Jan-May	0.5-2.0	>6.0	---	---	None	---	None.
105B2:									
Batavia	B								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.
119D2:									
Elco	B								
		Feb-April	2.0-3.5	2.8-4.5	---	---	None	---	None.
119E2:									
Elco	B								
		Feb-April	2.0-3.5	2.8-4.5	---	---	None	---	None.
134C2:									
Camden	B								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.
134D2:									
Camden	B								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.
134E2:									
Camden	B								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.
150B:									
Onarga	B								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.
198A:									
Elburn	B								
		Jan-May	1.0-2.0	>6.0	---	---	None	---	None.

Table 20.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
199B:									
Plano	B								
		Feb-April	4.0-6.0	>6.0	---	---	None	---	None.
242A:									
Kendall	B								
		Jan-May	0.5-2.0	>6.0	---	---	None	---	None.
243B:									
St. Charles	B								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.
257A:									
Clarksdale	C								
		Jan-May	0.5-2.0	>6.0	---	---	None	---	None.
259C2:									
Assumption	B								
		Feb-April	2.5-4.5	3.0-5.0	---	---	None	---	None.
271D2:									
Timula	B								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.
274E2:									
Seaton	B								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.
274F:									
Seaton	B								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.
274G:									
Seaton	B								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.
279B:									
Rozetta	B								
		Feb-April	4.0-6.0	>6.0	---	---	None	---	None.
279C2:									
Rozetta	B								
		Feb-April	4.0-6.0	>6.0	---	---	None	---	None.
279C3:									
Rozetta	B								
		Feb-April	4.0-6.0	>6.0	---	---	None	---	None.
280B2:									
Fayette	B								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.
280C2:									
Fayette	B								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.
280D2:									
Fayette	B								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.

Table 20.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
280E2:									
Fayette	B								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.
379A:									
Dakota	B								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.
379B:									
Dakota	B								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.
430B:									
Raddle	B								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.
536:									
Dumps, mine.									
549F:									
Marseilles	B								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.
549G:									
Marseilles	B								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.
558A:									
Breeds	B								
		Jan-May	1.0-2.0	>6.0	---	---	None	---	None.
567B2:									
Elkhart	B								
		Feb-April	4.0-6.0	>6.0	---	---	None	---	None.
567C2:									
Elkhart	B								
		Feb-April	4.0-6.0	>6.0	---	---	None	---	None.
570B:									
Martinsville	B								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.
596B:									
Marbletown	B								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.
630C3:									
Navlys	B								
		Feb-April	4.0-6.0	>6.0	---	---	None	---	None.
632A:									
Copperas	B/D								
		Jan-May	0.0-1.0	>6.0	0.0-0.5	Brief	Frequent	---	None.
675B:									
Greenbush	B								
		Feb-April	4.0-6.0	>6.0	---	---	None	---	None.

Table 20.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
779B:									
Chelsea	A								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.
779D:									
Chelsea	A								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.
801B:									
Orthents	B								
		Feb-April	4.0-6.0	5.0-6.0	---	---	None	---	None.
823B:									
Schuline	B								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.
823D:									
Schuline	B								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.
865:									
Pits, gravel.									
871B:									
Lenzburg	B								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.
871D:									
Lenzburg	B								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.
871G:									
Lenzburg	B								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.
872B:									
Rapatee	D								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.
876B:									
Lenzwheel	B								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.
876D:									
Lenzwheel	B								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.
876G:									
Lenzwheel	B								
		Jan-Dec	>6.0	>6.0	---	---	None	---	None.
3070A:									
Beaucoup	B/D								
		Jan-May	0.0-1.0	>6.0	0.0-0.5	Brief	Frequent	Brief	Frequent.
		June	---	---	---	---	None	Brief	Frequent.
		November	---	---	---	---	None	Brief	Frequent.
		December	---	---	---	---	None	Brief	Frequent.

Table 20.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
3074A:									
Radford	B								
		Jan-May	1.0-2.0	>6.0	---	---	None	Brief	Frequent.
		June	---	---	---	---	None	Brief	Frequent.
		November	---	---	---	---	None	Brief	Frequent.
		December	---	---	---	---	None	Brief	Frequent.
3077A:									
Huntsville	B								
		Nov-June	---	---	---	---	None	Brief	Frequent.
3107A:									
Sawmill	B/D								
		Jan-May	0.0-1.0	>6.0	---	---	None	Brief	Frequent.
		June	---	---	---	---	None	Brief	Frequent.
		November	---	---	---	---	None	Brief	Frequent.
		December	---	---	---	---	None	Brief	Frequent.
3284A:									
Tice	B								
		Jan-May	1.0-2.0	>6.0	---	---	None	Brief	Frequent.
		June	---	---	---	---	None	Brief	Frequent.
		November	---	---	---	---	None	Brief	Frequent.
		December	---	---	---	---	None	Brief	Frequent.
3333A:									
Wakeland	C								
		Dec-May	0.5-2.0	>6.0	---	---	None	Brief	Frequent.
		June	---	---	---	---	None	Brief	Frequent.
		November	---	---	---	---	None	Brief	Frequent.
3404A:									
Titus	B/D								
		Jan-May	0.0-1.0	>6.0	0.0-0.5	Brief	Frequent	Brief	Frequent.
		June	---	---	---	---	None	Brief	Frequent.
		November	---	---	---	---	None	Brief	Frequent.
		December	---	---	---	---	None	Brief	Frequent.
3415A:									
Orion	C								
		Jan-May	1.0-2.0	>6.0	---	---	None	Brief	Frequent.
		June	---	---	---	---	None	Brief	Frequent.
		November	---	---	---	---	None	Brief	Frequent.
		December	---	---	---	---	None	Brief	Frequent.
3451A:									
Lawson	C								
		Jan-May	1.0-2.0	>6.0	---	---	None	Brief	Frequent.
		June	---	---	---	---	None	Brief	Frequent.
		November	---	---	---	---	None	Brief	Frequent.
		December	---	---	---	---	None	Brief	Frequent.
3634A:									
Blyton	B								
		Nov-Jan	---	---	---	---	None	Brief	Frequent.
		Feb-April	2.0-3.5	>6.0	---	---	None	Brief	Frequent.
		May	---	---	---	---	None	Brief	Frequent.
		June	---	---	---	---	None	Brief	Frequent.

Table 20.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
3641L:									
Quiver	B/D								
		Nov-June	0.0-1.0	>6.0	0.0-1.0	Long	Frequent	Long	Frequent.
		July	0.0-1.0	>6.0	0.0-1.0	Brief	Frequent	---	None.
		August	0.0-1.0	>6.0	0.0-1.0	Brief	Frequent	---	None.
		September	0.0-1.0	>6.0	0.0-1.0	Brief	Frequent	---	None.
		October	0.0-1.0	>6.0	0.0-1.0	Brief	Frequent	---	None.
7081A:									
Littleton	B								
		Jan-May	1.0-2.0	>6.0	---	---	None	---	Rare.
		June	---	---	---	---	None	---	Rare.
		November	---	---	---	---	None	---	Rare.
		December	---	---	---	---	None	---	Rare.
8070A:									
Beaucoup	B/D								
		Jan-May	0.0-1.0	>6.0	0.0-0.5	Brief	Frequent	Brief	Occasional.
		June	---	---	---	---	None	Brief	Occasional.
		November	---	---	---	---	None	Brief	Occasional.
		December	---	---	---	---	None	Brief	Occasional.
8092B:									
Sarpy	A								
		Nov-June	>6.0	>6.0	---	---	None	Long	Frequent.
8183A:									
Shaffton	B								
		Jan-May	1.0-2.0	>6.0	---	---	None	Brief	Occasional.
		June	---	---	---	---	None	Brief	Occasional.
		November	---	---	---	---	None	Brief	Occasional.
		December	---	---	---	---	None	Brief	Occasional.
8284A:									
Tice	B								
		Jan-May	1.0-2.0	>6.0	---	---	None	Brief	Occasional.
		June	---	---	---	---	None	Brief	Occasional.
		November	---	---	---	---	None	Brief	Occasional.
		December	---	---	---	---	None	Brief	Occasional.
8302A:									
Ambraw	B/D								
		Jan-May	0.0-1.0	>6.0	---	---	None	Brief	Occasional.
		June	---	---	---	---	None	Brief	Occasional.
		November	---	---	---	---	None	Brief	Occasional.
		December	---	---	---	---	None	Brief	Occasional.
8404A:									
Titus	B/D								
		Jan-May	0.0-1.0	>6.0	0.0-0.5	Brief	Frequent	Brief	Occasional.
		June	---	---	---	---	None	Brief	Occasional.
		November	---	---	---	---	None	Brief	Occasional.
		December	---	---	---	---	None	Brief	Occasional.
8415A:									
Orion	C								
		Jan-May	1.0-2.0	>6.0	---	---	None	Brief	Occasional.
		June	---	---	---	---	None	Brief	Occasional.
		November	---	---	---	---	None	Brief	Occasional.
		December	---	---	---	---	None	Brief	Occasional.

Table 20.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
8595A:									
Coot	B								
		Jan-May	1.0-2.0	>6.0	---	---	None	Brief	Occasional.
		June	---	---	---	---	None	Brief	Occasional.
		November	---	---	---	---	None	Brief	Occasional.
		December	---	---	---	---	None	Brief	Occasional.
8608A:									
Mudhen	B/D								
		Jan-May	0.0-1.0	>6.0	0.0-0.5	Brief	Frequent	Brief	Occasional.
		June	---	---	---	---	None	Brief	Occasional.
		November	---	---	---	---	None	Brief	Occasional.
		December	---	---	---	---	None	Brief	Occasional.
8611A:									
Sepo	B/D								
		Jan-May	0.0-1.0	>6.0	0.0-0.5	Brief	Frequent	Brief	Occasional.
		June	---	---	---	---	None	Brief	Occasional.
		November	---	---	---	---	None	Brief	Occasional.
		December	---	---	---	---	None	Brief	Occasional.
8875B:									
Lenzlo	B								
		Jan-May	0.5-2.0	>6.0	---	---	None	Brief	Occasional.
		June	---	---	---	---	None	Brief	Occasional.
		November	---	---	---	---	None	Brief	Occasional.
		December	---	---	---	---	None	Brief	Occasional.
9017A:									
Keomah	C								
		Jan-May	0.5-2.0	>6.0	---	---	None	---	None.
9068A:									
Sable	B/D								
		Jan-May	0.0-1.0	>6.0	0.0-0.5	Brief	Frequent	---	None.
9257A:									
Clarksdale	C								
		Jan-May	0.5-2.0	>6.0	---	---	None	---	None.
9279B:									
Rozetta	B								
		Feb-April	4.0-6.0	>6.0	---	---	None	---	None.
9279C:									
Rozetta	B								
		Feb-April	4.0-6.0	>6.0	---	---	None	---	None.

Table 21.--Soil Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		In			
7C3:					
Atlas	---	>80	High	High	Moderate.
7D3:					
Atlas	---	>80	High	High	Moderate.
8D2:					
Hickory	---	>80	Moderate	Moderate	Moderate.
8E2:					
Hickory	---	>80	Moderate	Moderate	Moderate.
8F:					
Hickory	---	>80	Moderate	Moderate	Moderate.
8G:					
Hickory	---	>80	Moderate	Moderate	Moderate.
16A:					
Rushville	---	>80	High	High	High.
17A:					
Keomah	---	>80	High	High	Moderate.
17B:					
Keomah	---	>80	High	High	Moderate.
19D3:					
Sylvan	---	>80	High	Moderate	Moderate.
37B:					
Worthen	---	>80	High	Low	Low.
43A:					
Ipava	---	>80	High	High	Moderate.
45A:					
Denny	---	>80	High	High	Moderate.
68A:					
Sable	---	>80	High	High	Low.
75B:					
Drury	---	>80	High	Moderate	Moderate.
75C2:					
Drury	---	>80	High	Moderate	Moderate.
86B:					
Osco	---	>80	High	Moderate	Moderate.
86C2:					
Osco	---	>80	High	Moderate	Moderate.
88B:					
Sparta	---	>80	Low	Low	Moderate.

Table 21.--Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		In			
102A:					
La Hogue	---	>80	High	High	Moderate.
104A:					
Virgil	---	>80	High	High	Moderate.
105B2:					
Batavia	---	>80	High	High	Moderate.
119D2:					
Elco	---	>80	High	High	Moderate.
119E2:					
Elco	---	>80	High	High	Moderate.
134C2:					
Camden	---	>80	High	Low	Moderate.
134D2:					
Camden	---	>80	High	Low	Moderate.
134E2:					
Camden	---	>80	High	Low	Moderate.
150B:					
Onarga	---	>80	Moderate	Low	High.
198A:					
Elburn	---	>80	High	High	Moderate.
199B:					
Plano	---	>80	High	Moderate	Low.
242A:					
Kendall	---	>80	High	High	Moderate.
243B:					
St. Charles	---	>80	High	Moderate	Moderate.
257A:					
Clarksdale	---	>80	High	High	Moderate.
259C2:					
Assumption	---	>80	High	High	Moderate.
271D2:					
Timula	---	>80	High	Low	Low.
274E2:					
Seaton	---	>80	High	Low	Moderate.
274F:					
Seaton	---	>80	High	Low	Moderate.
274G:					
Seaton	---	>80	High	Low	Moderate.
279B:					
Rozetta	---	>80	High	Moderate	Moderate.
279C2:					
Rozetta	---	>80	High	Moderate	Moderate.

Table 21.--Soil Features--Continued

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In			
279C3:					
Rozetta	---	>80	High	Moderate	Moderate.
280B2:					
Fayette	---	>80	High	Moderate	Moderate.
280C2:					
Fayette	---	>80	High	Moderate	Moderate.
280D2:					
Fayette	---	>80	High	Moderate	Moderate.
280E2:					
Fayette	---	>80	High	Moderate	Moderate.
379A:					
Dakota	---	>80	Moderate	Low	Moderate.
379B:					
Dakota	---	>80	Moderate	Low	Moderate.
430B:					
Raddle	---	>80	High	Moderate	Moderate.
536:					
Dumps, mine.					
549F:					
Marseilles	Bedrock (paralithic)	20-40	High	High	Moderate.
549G:					
Marseilles	Bedrock (paralithic)	20-40	High	High	Moderate.
558A:					
Breeds	Bedrock (paralithic)	40-60	High	High	Moderate.
567B2:					
Elkhart	---	>80	High	Moderate	Moderate.
567C2:					
Elkhart	---	>80	High	Moderate	Moderate.
570B:					
Martinsville	---	>80	Moderate	Moderate	Moderate.
596B:					
Marbletown	Bedrock (paralithic)	40-60	High	Moderate	Moderate.
630C3:					
Navlys	---	>80	High	Moderate	Moderate.
632A:					
Copperas	Bedrock (paralithic)	40-60	High	High	Low.
675B:					
Greenbush	---	>80	High	Moderate	Moderate.

Table 21.--Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		In			
779B:					
Chelsea	---	>80	Low	Low	Low.
779D:					
Chelsea	---	>80	Low	Low	Low.
801B:					
Orthents	---	>80	High	High	Moderate.
823B:					
Schuline	---	>80	Moderate	Moderate	Low.
823D:					
Schuline	---	>80	Moderate	Moderate	Low.
865:					
Pits, gravel.					
871B:					
Lenzburg	---	>80	Moderate	Moderate	Low.
871D:					
Lenzburg	---	>80	Moderate	Moderate	Low.
871G:					
Lenzburg	---	>80	Moderate	Moderate	Low.
872B:					
Rapatee	---	>80	High	Moderate	Low.
876B:					
Lenzwheel	---	>80	Moderate	Moderate	Low.
876D:					
Lenzwheel	---	>80	Moderate	Moderate	Low.
876G:					
Lenzwheel	---	>80	Moderate	Moderate	Low.
3070A:					
Beaucoup	---	>80	High	High	Low.
3074A:					
Radford	---	>80	High	High	Low.
3077A:					
Huntsville	---	>80	High	Low	Low.
3107A:					
Sawmill	---	>80	High	High	Low.
3284A:					
Tice	---	>80	High	High	Low.
3333A:					
Wakeland	---	>80	High	Moderate	Low.
3404A:					
Titus	---	>80	High	High	Low.

Table 21.--Soil Features--Continued

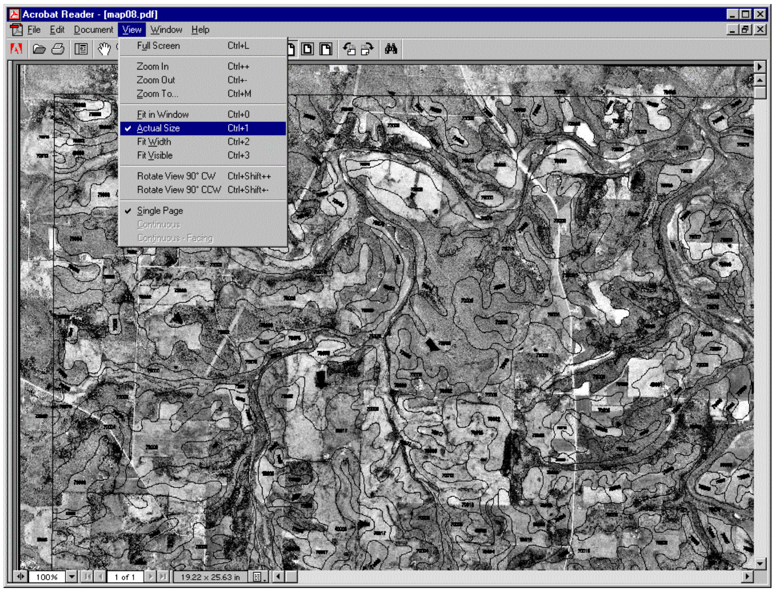
Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In			
3415A:					
Orion	---	>80	High	High	Low.
3451A:					
Lawson	---	>80	High	Moderate	Low.
3634A:					
Blyton	---	>80	High	Moderate	Low.
3641L:					
Quiver	---	>80	High	High	Low.
7081A:					
Littleton	---	>80	High	High	Low.
8070A:					
Beaucoup	---	>80	High	High	Low.
8092B:					
Sarpy	---	>80	Low	Low	Low.
8183A:					
Shaffton	---	>80	Moderate	High	High.
8284A:					
Tice	---	>80	High	High	Low.
8302A:					
Ambraw	---	>80	High	High	Moderate.
8404A:					
Titus	---	>80	High	High	Low.
8415A:					
Orion	---	>80	High	High	Low.
8595A:					
Coot	Bedrock (paralithic)	40-60	High	High	Moderate.
8608A:					
Mudhen	Bedrock (paralithic)	40-60	High	High	Moderate.
8611A:					
Sepo	---	>80	High	High	Low.
8875B:					
Lenzlo	---	>80	Moderate	Moderate	Low.
9017A:					
Keomah	---	>80	High	High	Moderate.
9068A:					
Sable	---	>80	High	High	Low.
9257A:					
Clarksdale	---	>80	High	High	Moderate.
9279B:					
Rozetta	---	>80	High	Moderate	Moderate.

Table 21.--Soil Features--Continued

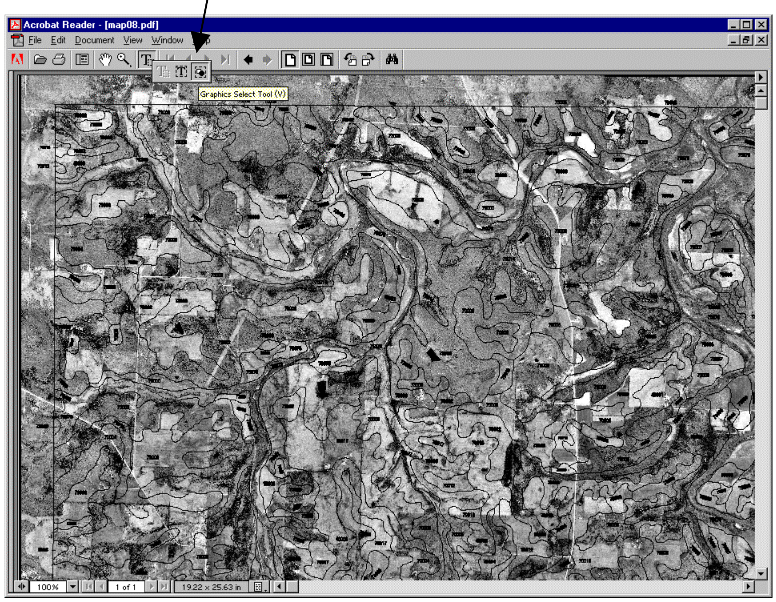
Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		In			
9279C:					
Rozetta	---	>80	High	Moderate	Moderate.

Printing Soil Survey Maps

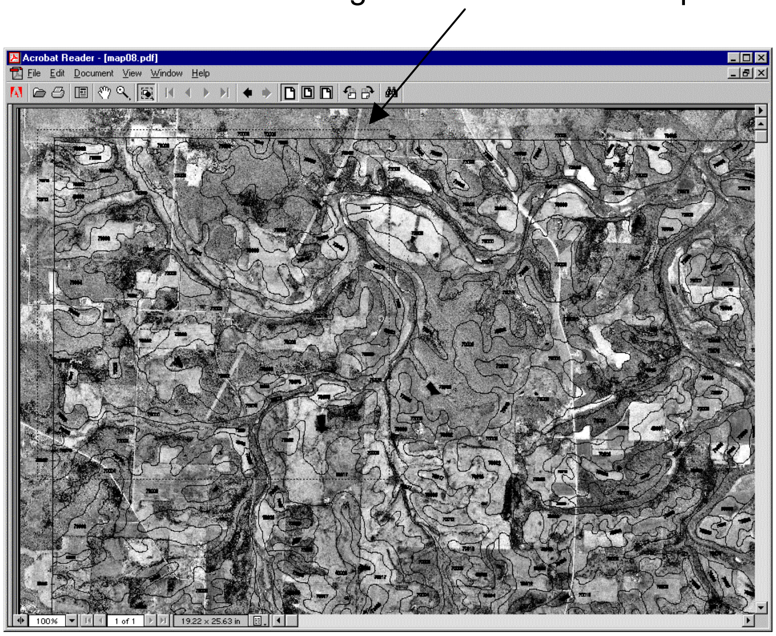
The soil survey maps were made at a scale of 1:12000 and were designed to be used at that scale. To print the maps at 1:12000 scale, set the view to Actual Size from the View pull down menu.



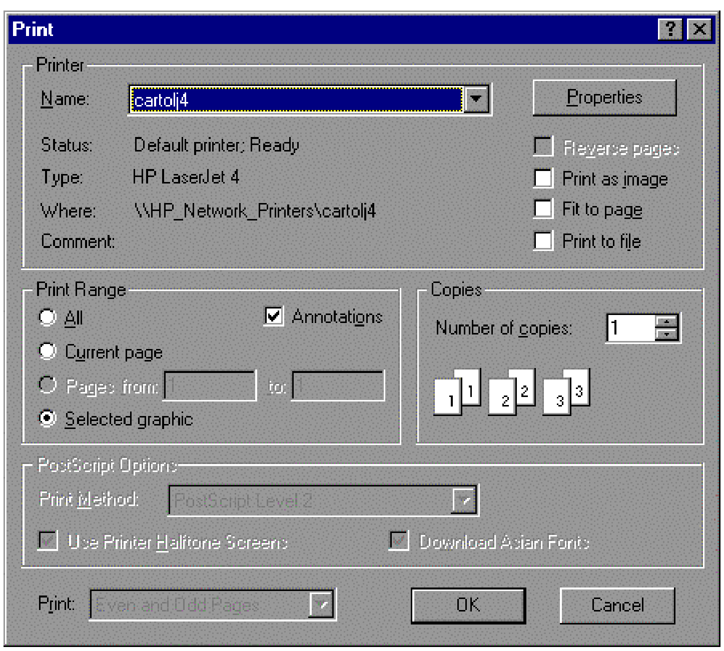
Using the pan tool, go to the area you would like to print. Select the Graphic Selection Tool by holding down the Text Selection Tool button and clicking on the Graphic Selection Tool button.



Then using the Graphic Selection Tool drag a box around the area you would like to print. Note dashed lines forming a box around area to print.



Select File Print. The Print Range will be set to Selected graphic. Click OK and the map will be sent to the printer.



NRCS SOILS 37A
3/95

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DESCRIPTION	SYMBOL

CULTURAL FEATURES

BOUNDARIES

- • National, state, or province
- • County or parish
- Minor civil division
- Reservation, (national forest or park, state forest or park)
- Land grant
- Limit of soil survey (label) and/or denied access areas
- • Field sheet matchline & neatline
- Previously published survey

OTHER BOUNDARY (label)

- Airport, airfield — Davis airstrip
- • Cemetery — St Johns Cemetery
- City / county Park — Central Park

STATE COORDINATE TICK

• LAND DIVISION CORNERS (section and land grants)

• GEOGRAPHIC COORDINATE TICK

TRANSPORTATION

- Divided roads
- Other roads
- # Trails

ROAD EMBLEMS & DESIGNATIONS

- • Interstate — 79; 79 345
- • Federal — 410; 410 224
- • State — 52; 52 347
- County, farm, or ranch — 376

RAILROAD

POWER TRANSMISSION LINE (normally not shown)

PIPELINE (normally not shown)

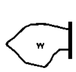
FENCE (normally not shown)

LEVEES

- Without road
- With road
- With railroad
- Single side slope (showing actual feature location)

DAMS

- Medium or small



LANDFORM FEATURES

- Prominent Hill or Peak
- Soil Sample Site

* Cultural features for use in Illinois

CULTURAL FEATURES (cont.)

MISCELLANEOUS CULTURAL FEATURES

- Farmland, house (omit in urban areas)
- Church
- School
- Other Religion (label) — Mt Carmel
- Located object (label) — Ranger Station
- Tank (label) — Petroleum
- Lookout Tower
- Oil and / or Natural Gas Wells
- Windmill
- Lighthouse

HYDROGRAPHIC FEATURES

STREAMS

- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end

DRAINAGE AND IRRIGATION

- Double line canal (label) — CANAL
- Perennial drainage and/or irrigation ditch
- Intermittent drainage and/or irrigation ditch

SMALL LAKES, PONDS, AND RESERVOIRS

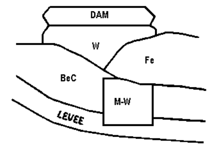
- Perennial water
- Miscellaneous water
- Flood pool line — FLOOD POOL LINE

MISCELLANEOUS WATER FEATURES

- Spring
- Well, artesian
- Well, irrigation

SPECIAL SYMBOLS FOR SOIL SURVEY AND SSURGO

SOIL DELINEATIONS AND SYMBOLS



LANDFORM FEATURES

- ESCARPMENTS
  - Bedrock
  - Other than bedrock
- SHORT STEEP SLOPE
- GULLY
- DEPRESSION, closed
- SINKHOLE

EXCAVATIONS

- PITS
  - Borrow pit
  - Gravel pit
  - Mine or quarry

LANDFILL

MISCELLANEOUS SURFACE FEATURES

- Blowout
- Clay spot
- Gravelly spot
- Lava flow
- Marsh or swamp
- Rock outcrop (includes sandstone and shale)
- Saline spot
- Sandy spot
- Severely eroded spot
- Slide or slip
- Sodic spot
- Spoil area
- Stony spot
- Very stony spot
- Wet spot

RECOMMENDED AD HOC SOIL SYMBOLS

	SYMBOL_ID			SYMBOL_ID	
	1			23	
	2			24	
	3			25	
	4	Gray spot		26 GSP	
	5			27	
	6			28	
	7	Calcareous spot		29 CSP	
	8	Muck spot		30 MUC	
	9			31	
	10			32	
	11			33	
Dumps	12 DMP			34	
	13	Mine subsided Area		35 MSA	
	14			36	
Oil brine spot	15 OBS			37	
	16			38	
	17			39	
	18	Glacial Till spot		40 GLA	
	19			41	
Disturbed soil spot	20 DSS			42	
	21			43	
	22			44	

Descriptions of Special Features

Name	Description	Label
Blowout	A small saucer-, cup-, or trough-shaped hollow or depression formed by wind erosion on a preexisting sand deposit. Typically 0.2 acre to 2.0 acres.	BLO
Borrow pit	An open excavation from which soil and underlying material have been removed, usually for construction purposes. Typically 0.2 acre to 2.0 acres.	BPI
Calcareous spot	An area in which the soil contains carbonates in the surface layer. The surface layer of the named soils in the surrounding map unit is noncalcareous. Typically 0.5 acre to 2.0 acres.	CSP
Clay spot	A spot where the surface layer is silty clay or clay in areas where the surface layer of the soils in the surrounding map unit is sandy loam, loam, silt loam, or coarser. Typically 0.2 acre to 2.0 acres.	CLA
Depression, closed	A shallow, saucer-shaped area that is slightly lower on the landscape than the surrounding area and that does not have a natural outlet for surface drainage. Typically 0.2 acre to 2.0 acres.	DEP
Disturbed soil spot	An area in which the soil has been removed and materials redeposited as a result of human activity. Typically 0.25 acre to 2.0 acres.	DSS
Dumps	Areas of nonsoil material that support little or no vegetation. Typically 0.5 acre to 2.0 acres.	DMP
Escarpment, bedrock	A relatively continuous and steep slope or cliff, produced by erosion or faulting, that breaks the general continuity of more gently sloping land surfaces. Exposed material is hard or soft bedrock.	ESB
Escarpment, nonbedrock	A relatively continuous and steep slope or cliff, generally produced by erosion but in some places produced by faulting, that breaks the continuity of more gently sloping land surfaces. Exposed earthy material is nonsoil or very shallow soil.	ESO
Glacial till spot	An exposure of glacial till at the surface of the earth. Typically 0.25 acre to 2.0 acres.	GLA
Gravel pit	An open excavation from which soil and underlying material have been removed and used, without crushing, as a source of sand or gravel. Typically 0.2 acre to 2.0 acres.	GPI
Gravelly spot	A spot where the surface layer has more than 35 percent, by volume, rock fragments that are mostly less than 3 inches in diameter in an area that has less than 15 percent rock fragments. Typically 0.2 acre to 2.0 acres.	GRA

Name	Description	Label
Gray spot	A spot in which the surface layer is gray in areas where the subsurface layer of the named soils in the surrounding map unit are darker. Typically 0.25 acre to 2.0 acres.	GSP
Gully	A small channel with steep sides cut by running water through which water ordinarily runs only after a rain or after melting of snow or ice. It generally is an obstacle to wheeled vehicles and is too deep to be obliterated by ordinary tillage.	GUL
Iron bog	An accumulation of iron in the form of nodules, concretions, or soft masses on the surface or near the surface of soils. Typically 0.2 acre to 2.0 acres.	BFE
Landfill	An area of accumulated waste products of human habitation, either above or below natural ground level. Typically 0.2 acre to 2.0 acres.	LDF
Levee	An embankment that confines or controls water, especially one built along the banks of a river to prevent overflow onto lowlands.	LVS
Marsh or swamp	A water-saturated, very poorly drained area that is intermittently or permanently covered by water. Sedges, cattails, and rushes are the dominant vegetation in marshes, and trees or shrubs are the dominant vegetation in swamps. Typically 0.2 acre to 2.0 acres.	MAR
Mine or quarry	An open excavation from which soil and underlying material have been removed and in which bedrock is exposed. Also denotes surface openings to underground mines. Typically 0.2 acre to 2.0 acres.	MPI
Mine subsided area	An area that is lower than the soils in the surrounding map unit because of subsurface coal mining. Typically 0.25 acre to 3.0 acres.	MSA
Miscellaneous water	A small, constructed body of water that is used for industrial, sanitary, or mining applications and that contains water most of the year. Typically 0.2 acre to 2.0 acres.	MIS
Muck spot	An area that occurs within an area of poorly drained or very poorly drained soil and that has a histic epipedon or an organic surface layer. The symbol is used only in map units consisting of mineral soil. Typically 0.2 acre to 2.0 acres.	MUC
Oil brine spot	An area of soil that has been severely damaged by the accumulation of oil brine, with or without liquid oily wastes. The area is typically barren but may have a vegetative cover of salt-tolerant plants. Typically 0.2 acre to 2.0 acres.	OBS
Perennial water	A small, natural or constructed lake, pond, or pit that contains water most of the year. Typically 0.2 acre to 2.0 acres.	WAT

Name	Description	Label
Rock outcrop	An exposure of bedrock at the surface of the earth. Not used where the named soils of the surrounding map unit are shallow over bedrock or where “Rock outcrop” is a named component of the map unit. Typically 0.2 acre to 2.0 acres.	ROC
Saline spot	An area where the surface layer has an electrical conductivity of 8 mmhos/cm-l more than the surface layer of the named soils in the surrounding map unit. The surface layer of the surrounding soils has an electrical conductivity of 2 mmhos/cm-l or less. Typically 0.2 acre to 2.0 acres.	SAL
Sandy spot	A spot where the surface layer is loamy fine sand or coarser in areas where the surface layer of the named soils in the surrounding map unit is very fine sandy loam or finer. Typically 0.2 acre to 2.0 acres.	SAN
Severely eroded spot	An area where, on the average, 75 percent or more of the original surface layer has been lost because of accelerated erosion. Not used in map units in which “severely eroded,” “very severely eroded,” or “gullied” is part of the map unit name. Typically 0.2 acre to 2.0 acres.	ERO
Short steep slope	A narrow area of soil having slopes that are at least two slope classes steeper than the slope class of the surrounding map unit.	SLP
Sinkhole	A closed depression formed either by solution of the surficial rock or by collapse of underlying caves. Typically 0.2 acre to 2.0 acres.	SNK
Slide or slip	A prominent landform scar or ridge caused by fairly recent mass movement or descent of earthy material resulting from failure of earth or rock under shear stress along one or several surfaces. Typically 0.2 acre to 2.0 acres.	SLI
Sodic spot	An area where the surface layer has a sodium adsorption ratio that is at least 10 more than that of the surface layer of the named soils in the surrounding map unit. The surface layer of the surrounding soils has a sodium adsorption ratio of 5 or less. Typically 0.2 acre to 2.0 acres.	SOD
Spoil area	A pile of earthy materials, either smoothed or uneven, resulting from human activity. Typically 0.2 acre to 2.0 acres.	SPO
Stony spot	A spot where 0.01 to 0.1 percent of the surface cover is rock fragments that are more than 10 inches in diameter in areas where the surrounding soil has no surface stones. Typically 0.2 acre to 2.0 acres.	STN
Unclassified water	A small, natural or manmade lake, pond, or pit that contains water, of an unspecified nature, most of the year. Typically 0.2 acre to 2.0 acres.	UWT

Name	Description	Label
Very stony spot	A spot where 0.1 to 3.0 percent of the surface cover is rock fragments that are more than 10 inches in diameter in areas where the surface cover of the surrounding soil is less than 0.01 percent stones. Typically 0.2 acre to 2.0 acres.	STV
Wet depression	A shallow, concave area within an area of poorly drained or very poorly drained soils in which water is ponded for intermittent periods. The concave area is saturated for appreciably longer periods of time than the surrounding soil. Typically 0.2 acre to 2.0 acres.	WDP
Wet spot	A somewhat poorly drained to very poorly drained area that is at least two drainage classes wetter than the named soils in the surrounding map unit. Typically 0.2 acres to 2.0 acres.	WET