United States Department of Agriculture

Natural Resources Conservation Service

In cooperation with Illinois Agricultural Experiment Station

Soil Survey of Marion County, Illinois

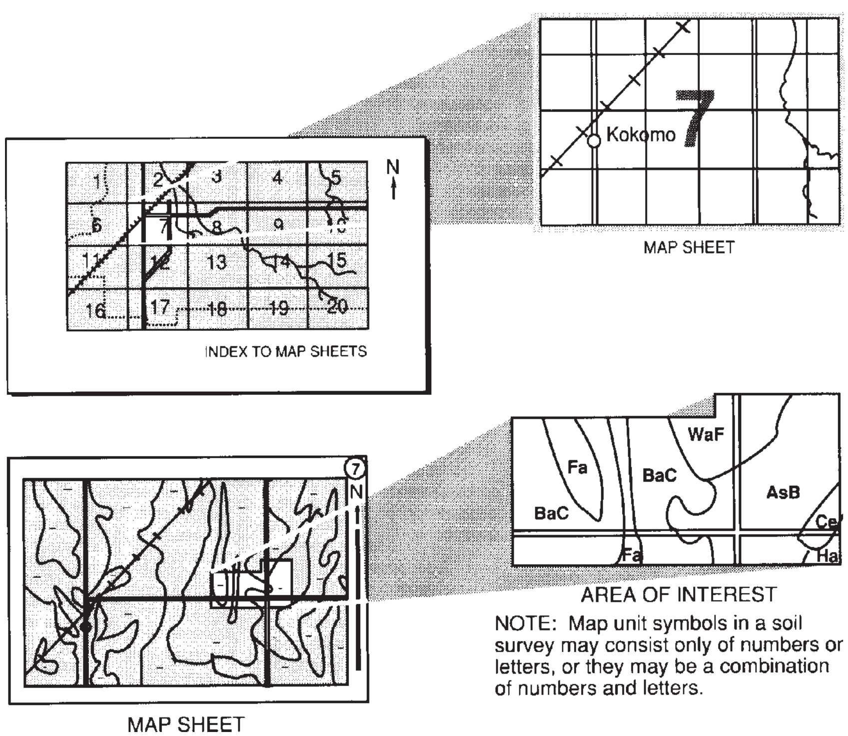
How To Use This Soil Survey

This publication consists of a manuscript and a set of soil maps. The information provided can be useful in planning the use and management of small areas.

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

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

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



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

National Cooperative Soil Survey

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey. This survey was made cooperatively by the Natural Resources Conservation Service and the Illinois Agricultural Experiment Station. It is part of the technical assistance furnished to the Marion County Soil and Water Conservation District. Financial assistance was provided by the Marion County Board and the Illinois Department of Agriculture.

Major fieldwork for this soil survey was completed in 2007. Soil names and descriptions were approved in 2007. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 2007. The tables reflect the data in effect as of August 2009. The most current official data are available via the Web Soil Survey (http://soils.usda.gov).

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

Nondiscrimination Statement

Cover Photo Caption

Soybeans in an area of Birds soils. In the background, Ava and Hickory soils are used for pasture and hay.

Additional information about the Nation's natural resources is available online from the Natural Resources Conservation Service at http://www.nrcs.usda.gov.

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Issued 2009

Numerical Index to Map Units

Foreword

Soil surveys contain information that affects land use planning in survey areas. They include predictions of soil behavior for selected land uses. The surveys highlight soil limitations, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

Soil surveys are designed for many different users. Farmers, foresters, and agronomists can use the surveys 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 surveys 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 surveys to help them understand, protect, and enhance the environment.

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

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://soils.usda.gov/sqi/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://soils.usda.gov/contact/state_offices/).

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

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

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Soil Survey of
Marion County, Illinois

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

MARION COUNTY is in southern Illinois (fig. 1). It has an area of about 368,685 acres, or 576 square miles. It is bordered on the north by Fayette County, on the east by Clay and Wayne Counties, on the south by Jefferson County, and on the west by Clinton, Fayette, and Washington Counties. In 2007, the population of Marion County was estimated at 39,587. The population of Centralia was 13,583, and the population of Salem, the county seat, was 7,470 (U.S. Department of Commerce).

This survey updates the survey of Marion County published in 1996 (Miles, 1996). It has larger maps that show the soils in more detail. Some of the information from the 1996 survey has been incorporated in this publication with little or no alteration.

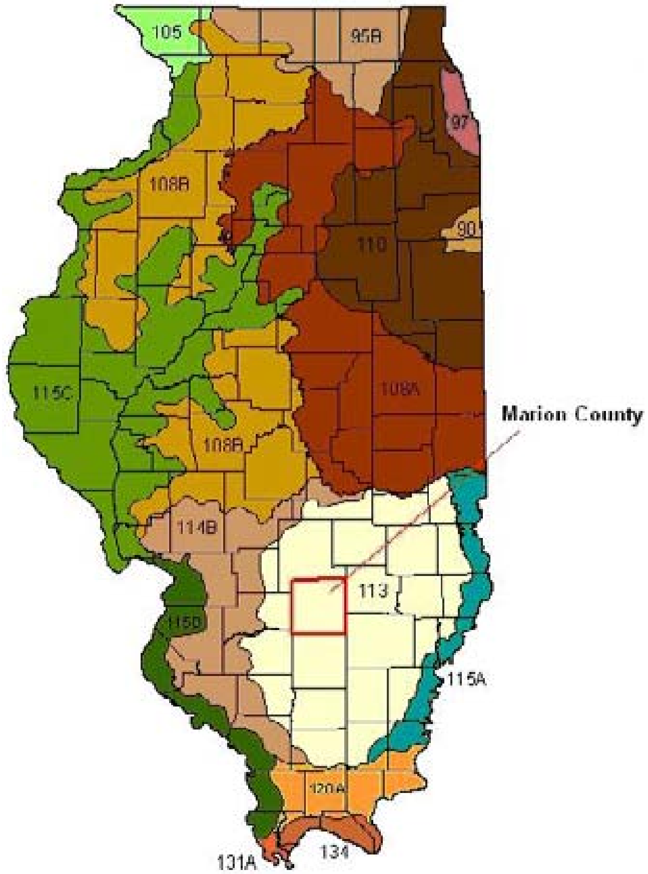
General Nature of the County

This section provides general information about Marion County. It describes history and development; physiography, relief, and drainage; natural resources; and climate.

History and Development

In 1790, the survey area was still a part of the Northwest Territory. It consisted of parts of St. Clair and St. Knox Counties. The land remained divided between the two counties until 1801. By 1813, the area had been broken up into more counties; the area that is now Marion County was included in the new counties of Edwards, Jefferson, Crawford, and Fayette. In 1818, Captain Samuel Young and his 9-year-old son were among the first settlers in the area (Illinois Genealogy Trails).

Marion County was formed in 1823 and named after General Francis Marion (the "Swamp Fox") of the Revolutionary War. There were nearly 2,000 people living in the county at the time. The convenience of the Old Vincennes/St. Louis Road (U.S. 50)



LEGEND

95B—Southern Wisconsin and Northern Illinois Drift Plain
97—Southwestern Michigan Fruit and Truck Crop Belt
98—Southern Michigan and Northern Indiana Drift Plain
105—Northern Mississippi Valley Loess Hills
108A and 108B—Illinois and Iowa Deep Loess and Drift
110—Northern Illinois and Indiana Heavy Till Plain
113—Central Claypan Areas
114B—Southern Illinois and Indiana Thin Loess and Till Plain, Western Part
115A, 115B, and 115C—Central Mississippi Valley Wooded Slopes
120A—Kentucky and Indiana Sandstone and Shale Hills and Valleys, Southern Part
131A—Southern Mississippi River Alluvium
134—Southern Mississippi Valley Loess

Figure 1.—Location of Marion County and the major land resource areas (MLRAs) in Illinois.

and the railroad kept Marion County prosperous during a period when other areas were struggling.

Marion County’s rich soils were used mainly for farming. A large portion of the county was underlain with a thin vein of coal, and sandstone was abundant. The first oil was struck around 1908 (Illinois Genealogy Trails).

Agriculture is a leading industry in Marion County. In 2002, there were 1,095 farms, which averaged about 239 acres in size and accounted for 261,899 acres. The market value of agricultural products sold was about 38.9 million dollars. Corn and soybeans were the main crops grown; 63,388 acres of corn was harvested for grain, and 91,503 acres of soybeans was harvested. Wheat was harvested from 11,386 acres, grain sorghum was harvested from 5,630 acres, and forage crops were grown on 9,353 acres. Some areas were used for orchard crops or vegetables. Marion County also supports significant livestock production. In 2002, 32,579 hogs and pigs and 5,370 cattle and calves were sold (USDA, National Agricultural Statistics Service, 2002).

Marion County has a well developed system of roads. Federal and State highways in the county include Interstate 57, U.S. Highways 50 and 51, and State Highway 37. Numerous county and township roads also provide important transportation links. Several railroad lines provide freight service, and an Amtrak station in Centralia provides transportation north to Chicago and south to New Orleans.

Physiography, Relief, and Drainage

The northwestern part of Marion County lies within the Springfield Plain, and the southeastern part is in the Mt. Vernon Hill Country. Both of these areas are divisions of the Till Plains Section, Central Lowland Physiographic Province. The Springfield Plain includes the level portion of the Illinoian drift-sheet in central and south-central Illinois. It is distinguished mainly by its flatness and by shallow entrenchment of drainage. The Mt. Vernon Hill Country has a mature topography of low relief with limited upland prairies and broad alluviated valleys along the larger streams (Leighton and others, 1948).

During the Pleistocene, glaciers covered Marion County. In the Springfield Plain area of the county, most of the present surface materials and landforms are the result of the glacial ice, glacial meltwater, and wind passing over the landscape during the most recent glacial episodes, the Wisconsinan and the Illinoian. In the Mt. Vernon Hill Country area, Illinoian till is thin and bedrock is the controlling factor affecting landform type (Leighton and others, 1948).

During the Illinoian Episode, glaciers deposited till over Pennsylvanian sandstone, shale, and limestone throughout the county. The till ranges from several feet to more than 100 feet in thickness (Frankie and others, 1995). The till is known as the Vandalia Till Member of the Glasford Formation. Kames and eskers of the Hagarstown Member of the Pearl Formation lie above the Vandalia Till Member in parts of the county (Richmond and Fullerton, 1983) (fig. 2).

Later, as the Wisconsinan glaciers were retreating from northern Illinois, valleys tributary to the Wabash River became slackwater lakes of glacial meltwater. This area, part of the Equality Formation, received deposits of lacustrine material several feet thick. Deposits of more recent alluvium along present rivers and streams make up the Cahokia Formation (Willman and others, 1975) (fig. 2). In most areas the glacial drift was covered with as much as 5 feet of windblown silt, or loess, known as Peoria Silt. Erosion has since thinned the loess mantle in some areas.

The relief in Marion County is low in the nearly level and gently sloping, broad uplands. The greatest change in relief is in areas along major drainageways, especially in the Mt. Vernon Hill Country area, where there is as much as a 50-foot drop in elevation from the adjacent uplands (fig. 3). Elevation ranges from 655 feet above mean sea level (1 mile south of Kinmundy) to less than 420 feet above mean sea level (at the point where the Skillet Fork River crosses the county line into Wayne County).

The Skillet Fork River and its tributaries drain the eastern part of Marion County (fig. 4) to the south and east, toward the Wabash River. The western part of the county is drained by the East Fork Kaskaskia, Crooked Creek, and other tributaries of the Kaskaskia River, which eventually drains into the Mississippi. The flood plains along these rivers and tributaries generally are flooded annually, and the soils in these areas often have a seasonal high water table.

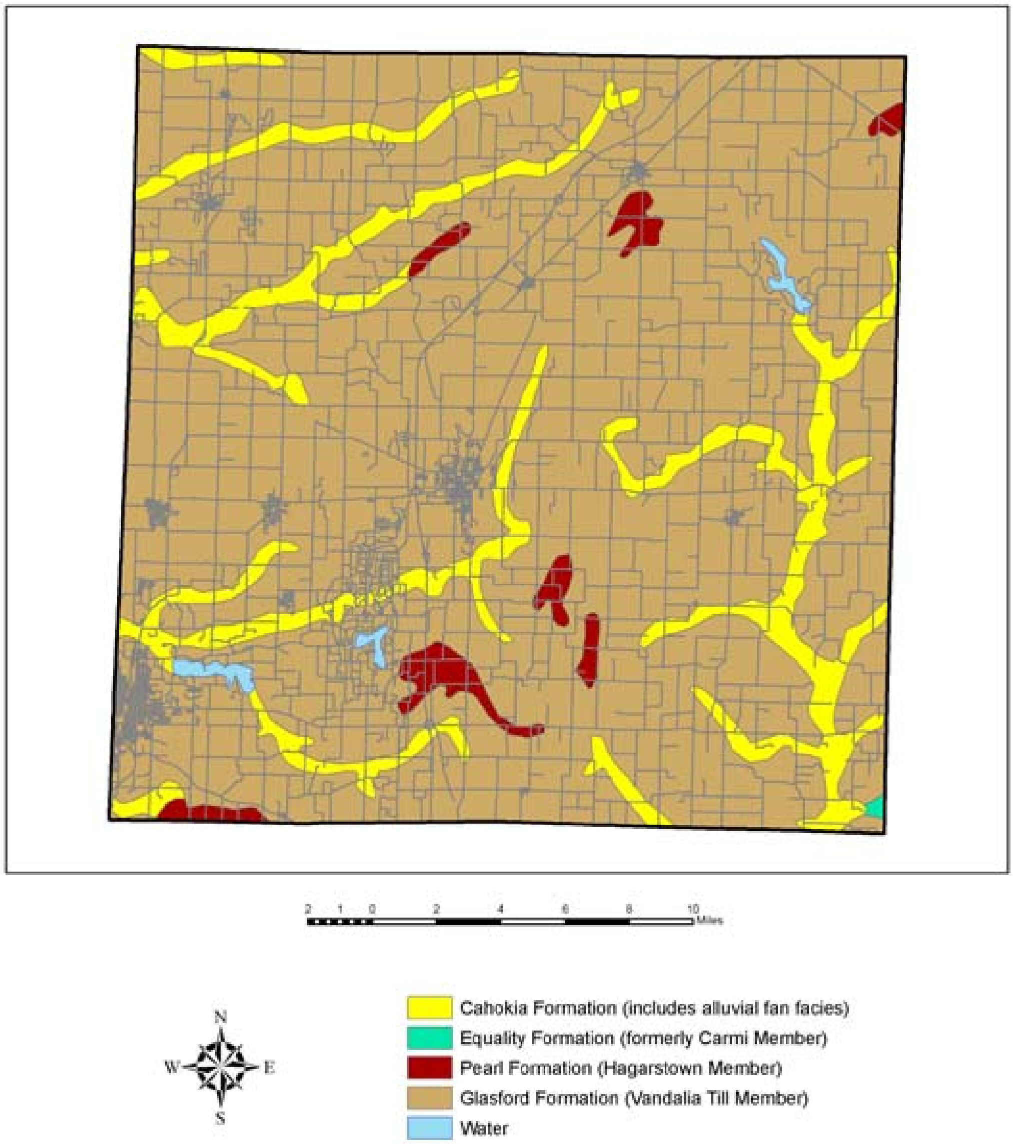


Figure 2.—Quaternary geology of Marion County, Illinois. Sources: Data layers modified by USDA/NRCS from the Illinois Department of Natural Resources/Illinois Geographical Information System Digital Data of Illinois (Illinois Department of Natural Resources, 1996; Lineback and others, 1979). Formations renamed based on Illinois State Geological Survey Bulletin 104 (Hansel and Johnson, 1996).

Most areas of the county are sufficiently drained for the crops commonly grown. An extensive system of surface drainage ditches supplements the natural drainage. Maintenance of these drainage ditches is needed.

Natural Resources

Most of Marion County is underlain by deposits of oil, natural gas, or coal. The county led the State in oil production from 1888 to 1992, with a cumulative total of nearly 438 million barrels (Frankie and others, 1995) (fig. 5). Currently, no coal mines are in operation in Marion County, but several underground mines produced coal in

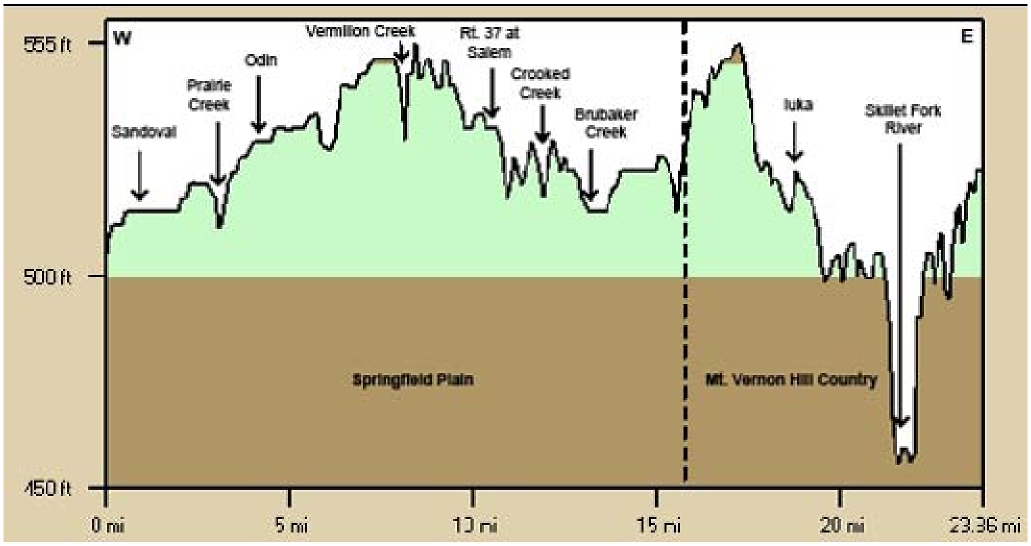


Figure 3.—An elevation cross-section of Marion County, Illinois, from west to east. Source: 3-D Topoquads Copyright 1999 DeLorme Yarmouth, ME 04096; Datum NAD 27.

the southwestern part of the county from 1883 to 1964 (Illinois Department of Natural Resources and Illinois State Geological Survey, 2008). It is estimated that over 4 billion tons of coal reserves remain, and about 200 million tons is considered recoverable (Jacobson and Korose, 2003).

Figure 4.—The Skillet Fork River in southeastern Marion County.

Figure 5.—Crude oil is a valuable natural resource in the county.

Soil is a major natural resource in Marion County. The soils range from low to high in natural fertility. If fertilizers and lime are added, most of the soils are well suited to the cultivation of crops, particularly corn and soybeans. Many of the soils are nearly level or gently sloping and formed in medium textured material under either woodland or a mixture of woodland and prairie grass vegetation. Combined with a favorable climate, these soils have good potential as highly productive farmland.

At the time of settlement, about 150,000 acres of the county was forestland (Iverson and others, 1989). In 2000, about 76,000 acres, or 21 percent of the county, was forestland (Illinois Department of Agriculture Web site). Much of the forestland is along the major streams and their tributaries in areas that are too steep for tillage. Woodland provides important wildlife habitat, watershed protection, and recreational areas.

The county has approximately 3,300 acres of impounded water. Raccoon Lake, Forbes Lake, and Lake Centralia occupy about 575 acres, 510 acres, and 250 acres, respectively. The rest of the impounded water is in about 1,500 smaller lakes and ponds scattered throughout the county. In much of the county, the residents rely on surface water for their water supply. Raccoon Lake provides water to the residents of Centralia and many other surrounding towns (City of Centralia Web site). A 70-acre surface water reservoir helps to supply water to the city of Salem (Salem, Illinois, Web site).

The county has a limited supply of ground water. Because glacial deposits generally are thin in this area, sand and gravel deposits are scarce throughout most of the county. The buried Sandoval Valley in the west-central part of the county has potential as a source of ground water, but this area would need further exploration for industrial and municipal water supplies. Pennsylvanian-age sandstones are a source of farm and domestic water supplies, particularly southeast of Salem (Frankie and others, 1995).

Climate

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

In winter, the average temperature is 32.6 degrees F and the average daily minimum temperature is 23.9 degrees. The lowest temperature during the period of record, which occurred at Salem on January 19, 1994, is -23 degrees. In summer, the average temperature is 76.0 degrees and the average daily maximum temperature is 87.2 degrees. The highest temperature, which occurred at Salem on August 20, 1983, is 105 degrees.

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

The average annual total precipitation is 42.54 inches. Of this total, 26.18 inches, or about 62 percent, usually falls in April through October. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period of record was 4.9 inches at Salem on August 4, 1998. Thunderstorms occur on about 46 days each year, and most occur in June.

The average seasonal snowfall is 14.4 inches. The greatest snow depth at any one time during the period of record was 27 inches recorded on February 9, 1982. On an average, 19 days per year have at least 1 inch of snow on the ground. The heaviest 1-day snowfall on record was 13.5 inches recorded on January 31, 1982.

The average relative humidity in midafternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 76 percent. The sun shines 66 percent of the time possible in summer and 48 percent in winter. The prevailing wind is from the northwest. Average windspeed is highest, 11.6 miles per hour, in March.

How This Survey Was Made

Land resource regions (LRRs) and their component major land resource areas (MLRAs) serve as a basis for making decisions about national and regional agricultural and natural resources issues. These land categories group geographical areas that are characterized by a particular pattern of soils, climate, water resources, and land use. Major land resource areas are geographically associated land resource units that share a common land use, elevation, topography, climate, water, soils, and potential natural vegetation (USDA, NRCS, 2006). Marion County is in LRR M (Central Feed Grains and Livestock Region) and in MLRA 113 (Central Claypan Areas) (fig. 1) (USDA, NRCS, 2006).

Soil surveys are updated as part of maintenance projects that are conducted for an MLRA or other region. Maintaining and coordinating soil survey information within a broad area can result in uniformly delineated and joined soil maps and in coordinated interpretations and map unit descriptions for areas within each MLRA.

Updated soil survey information is coordinated within the MLRA or other region and meets the standards established and defined in the memorandum of understanding. Soil surveys that are consistent and uniform within a broad area enable the coordination of soil management recommendations and a uniform program application of soils information.

This soil survey was made to provide updated information about the soils and miscellaneous areas in Marion County. Map unit design and the detailed soil descriptions are based on the occurrence of each soil throughout an MLRA. The information in this survey includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses.

Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; and the kinds of crops and native plants. The soil scientists used soil probes or spades 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 landform.

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 the water table will always be at a specific level in the soil on a specific date.

The soil survey information in this publication was based on a review of field notes, laboratory data, and other data collected during the previous soil survey of Marion County (Miles, 1996). Selected soils were resampled to a greater depth than that studied in the previous survey. In addition, data from other soil surveys within MLRA 113 were reviewed. Reviewing data on a regional basis can result in improved consistency in the identification, classification, and interpretations of soils on similar landscapes.

Aerial photographs used in this survey were taken in 1998. Soil scientists also studied U.S. Geological Survey topographic maps (enlarged to a scale of 1:12,000) and orthophotographs to relate land and image features. Specific soil boundaries were drawn on the orthophotographs. Adjustments of soil boundary lines were made to coincide with the U.S. Geological Survey topographic map contour lines and tonal patterns on aerial photographs.

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.

Factors of Soil Formation

Soil is produced by soil-forming processes acting on materials deposited or accumulated by geologic agents. The characteristics of the soil are determined by (1) the physical and mineralogical composition of the parent material; (2) the climate under which the soil formed; (3) the plant and animal life on and in the soil; (4) the relief, or lay of the land; and (5) the length of time the forces of soil formation have acted on the parent material (Jenny, 1941).

Climate and plant and animal life are the active factors of soil formation. These factors act directly on the parent material, either in place or after it has been relocated by water, glaciers, or the wind, and slowly change it to a natural body that has genetically related layers, or horizons. Relief can modify the effects of climate and plant and animal life. In sloping areas, for example, erosion can inhibit the processes of soil formation. Wetness can slow these processes in level or depressional areas. The parent material also affects the kind of soil profile that is formed. Finally, time is needed for changing the parent material into a soil profile that has clearly differentiated horizons.

The factors of soil formation are so closely interrelated in their effects on the soil that few generalizations can be made regarding the effects of any one factor unless the effects of the other factors are known. Many of the processes of soil formation are unknown.

Parent Material

Parent material is the unconsolidated organic and mineral material in which a soil forms. It determines the chemical and mineralogical composition of the soil. Most of the parent material in Marion County is a direct result of the glaciers of the Illinoian Age and meltout of the Wisconsinan Age (Willman and Frye, 1970). Although the kinds of parent material in the county are associated with glacial deposits, the properties vary greatly, mostly because of varying modes of deposition. The dominant kinds of parent material in Marion County are till, loess, outwash, lacustrine material, alluvium, and weathered bedrock. Except for the bedrock, these materials were deposited by wind, water, glaciers, or glacial meltwater. In some areas the materials have been reworked by wind or water after they were deposited. Many of the soils formed in more than one kind of parent material. For example, many of the soils in Marion County formed in loess and in the underlying sediment, geosol, or till (fig. 6).

Till is material laid down directly by glaciers. It consists of clay, silt, sand, gravel, and boulders, all of which are mixed together. The gravel has distinct edges and corners, indicating that it has not been subjected to intensive washing by water. Unweathered till is generally alkaline, calcareous, and very dense. Through the

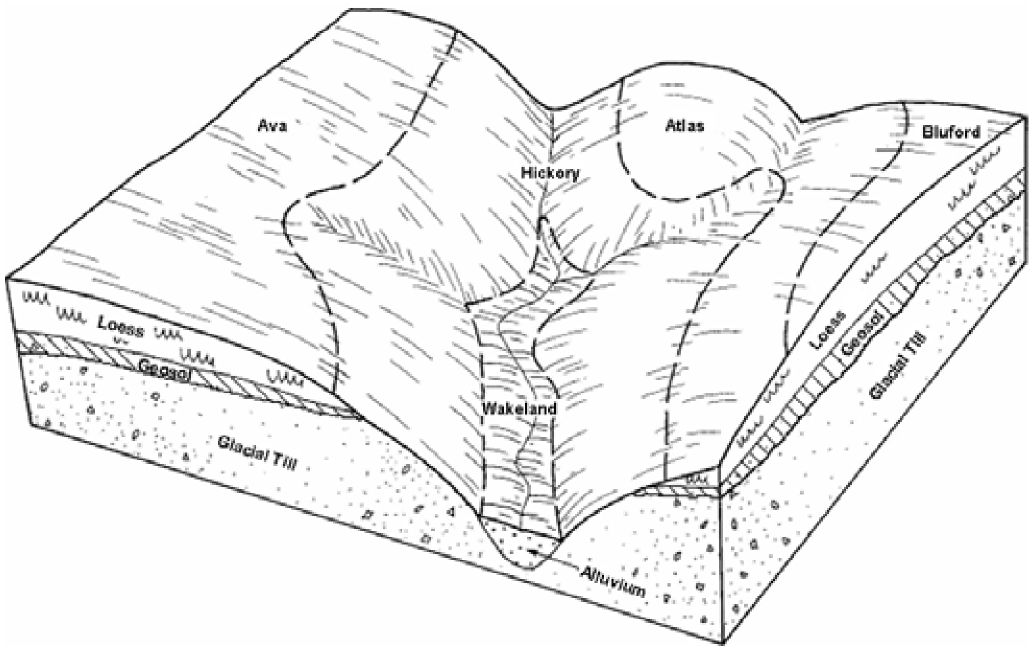


Figure 6.—A common soils-landscape relationship in Marion County, Illinois.

processes of soil formation, the upper 1 to 2 meters of the till that is exposed to biological activity becomes less alkaline and less dense.

The till in Marion County was deposited during the glacial ice advance of the Illinoian Age during the Pleistocene (Willman and Frye, 1970). This advance occurred during a period that began almost 300,000 years ago and continued for almost 175,000 years. Most of the county is covered by a till deposit known as the Vandalia Till Member of the Glasford Formation. An interglacial period known as the Sangamon Episode began about 100,000 to 125,000 years ago and lasted for about 50,000 to 75,000 years. During this period, soils developed in the till. These soils were subsequently buried during the Wisconsinan Age, first by Roxana Silt and later by Peoria Loess. These ancient soils are called paleosols or Sangamon Geosol. The majority of modern soils that occur on the Illinoian till plain are underlain by this geosol, typically at a depth of $1^{1}/_{2}$ meters or more, and are not appreciably being affected by present-day soil-forming factors. Atlas and Passport soils are examples of soils in which the Sangamon Geosol is within 1 meter of the soil surface. The paleosols in these soils are close enough to the surface to be subjected to present-day soil-forming factors. In dissected areas on the till plain along many of the drainageways in the county, the Sangamon Geosol has been eroded away. A modern soil known as the Hickory series formed in the exposed till (fig. 7).

Loess is material deposited by wind. It consists of uniform, silt-sized particles that were typically calcareous before being acted upon by soil-forming factors. The meltwaters from the glaciers carried vast quantities of silt, which were deposited in the major river valleys. As these sediments were exposed when the meltwaters subsided, winds carried the silts and deposited them over much of the land. Most of the soils in the county formed at least partially in loess. The thickness of the loess ranges from virtually zero in areas where slopes are very steep to more than 1 meter in the nearly level areas on uplands. Soils that have a fragic, or dense, layer developed in historically forested areas where Peoria Loess, typically less than 1

Figure 7.—Hickory soils, which formed in till, provide valuable habitat for woodland wildlife throughout the county.

meter thick, overlies Roxana Silt. The moderately well drained Ava and Plumfield soils have a fragipan within 1 meter of the soil surface.

Outwash is stratified material deposited by flowing glacial meltwater. The size of the particles that make up outwash varies, depending on the velocity of the moving water. Typically, outwash is dominated by material that is fine sand or coarser. The coarser material was deposited nearer to the ice or in rapidly moving glacial meltwater streams. Most of the outwash deposits were later covered by loess. Parke and Richview soils formed in loess and in the underlying outwash on kames and eskers.

Lacustrine material is largely quiet-water glacial lake sediments or shallow slackwater sediments. It is distinguished from outwash in that it is dominated by silt and clay. The lacustrine material in Marion County is in a small area of the Skillet Fork River Valley where the river exits the county.

Alluvium is material that was deposited by floodwater from modern streams. Soils that formed in alluvium are generally stratified in both color and texture. The alluvial soils consist mostly of silty sediments, but in some places the soils have layers of loamy and sandy material. Banlic, Belknap, and Bonnie soils formed in silty alluvium. Holton, Orion, and Wirt soils formed in loamy alluvium. The alluvial soils are along creeks and rivers throughout the county.

Bedrock is at a depth of less than 50 feet throughout most of Marion County but is as much as 100 feet deep in a few places. In areas where bedrock is at or near the surface, soils formed in the material weathered from the bedrock. Gosport and Kell soils are examples (fig. 8).

Figure 8.—Exposed bedrock in an area of Kell soils.

Climate

Marion County has a temperate, humid, continental climate that is essentially uniform throughout the county. Climatic differences within the county are too small to have caused obvious differences among the soils. In some areas of the county, however, the effects of climate are modified locally by relief. The influence of climate becomes more obvious when comparisons are made on a broad regional basis.

Climate affects soil formation through its influence on weathering, plant and animal life, and erosion. Water from rains and melting snow seeps slowly downward through the soil and allows physical and chemical reactions to take place in the parent material. Where the water can move downward, it moves clay from the surface soil into the subsoil. Water also dissolves minerals and moves them downward through the soil. Leaching has removed calcium carbonate in the upper part of soils that formed in limy parent materials to depths of more than 40 inches in most of the survey area. As a result, other pedogenic processes act on the soil, causing the biochemical breakdown of minerals and the translocation of clay. In addition, with the removal of bases, these soils tend to be strongly or very strongly acid in the upper part.

The temperature of the soil affects soil formation. When the soil is frozen, for example, many of the processes of soil formation are halted or restricted.

Climate also influences the kind and extent of plant and animal life. The climate in Marion County has favored tall prairie grasses and deciduous hardwoods. It also has favored the decomposition of plants and animals, which provides humus to the soil.

Heavy, untimely rains can be destructive when they fall on soils that are bare of vegetation. The raindrops disperse the soil particles, thereby contributing to erosion and the formation of crusts. Early spring rains in these areas can cause extensive erosion when the soils are partially frozen. As a result, the rate of surface water runoff is increased.

Plant and Animal Life

Soils are greatly affected by the type of vegetation under which they formed. The chief contribution of vegetation and biological processes to soil formation is the addition of organic material and nitrogen to the soil. The amount of organic material in the soil depends primarily on the kind of native plants that grew on the soil. The remains of plants accumulated on or below the surface, decayed, and eventually became soil organic matter, or humus. The roots of the plants provided channels for the downward movement of water through the soil and added organic material as they decayed.

The native vegetation in Marion County consisted primarily of tall prairie grasses and deciduous hardwoods. At the time of early settlement, about 59 percent of the county supported prairie grasses (Iverson and others, 1989) with scattered trees and shrubs. These grasses have many fibrous roots that contributed large amounts of organic material to the soil, especially where they were concentrated near the surface. Soils that formed under prairie vegetation have a thick, black or dark brown surface layer. They generally are in areas of low relief and/or in areas that had poor or somewhat poor natural drainage. Cisne and Hoyleton soils are examples. These soils have a moderately thick, dark brown surface layer.

About 41 percent of the county supported timber at the time of early settlement (Iverson and others, 1989). The organic material that deciduous hardwoods contributed to the soil consisted mainly of leaf litter because the root systems of the hardwoods are less fibrous than those of grasses and generally are not so concentrated near the surface. The soils that formed under forest vegetation have a surface layer that is thinner and lighter colored than that of the prairie soils. Ava, Bluford, and Hickory soils formed under forest vegetation. They generally are on summits, on broad interfluves, and on backslopes along drainageways (fig. 6).

Micro-organisms, earthworms, insects, and burrowing animals that live in or on the soil also have affected soil formation. Bacteria and fungi help to decompose plant and animal remains and change them into humus. Burrowing animals, such as earthworms, cicadas, crayfish, and ground squirrels, help to incorporate the humus into the soil and create small channels that influence soil aeration and the percolation of water. Humus is very important in the formation of soil structure and good tilth.

Human activities, such as installing subsurface drains, building levees for flood protection, constructing buildings, and clearing native forests, have significantly altered the nature of the existing plant and animal communities. Some of these activities have also contributed to the loss of soil material and organic material through accelerated erosion.

Relief

Relief, or local changes in elevation, has markedly affected the soils in Marion County through its effect on runoff, erosion, deposition, and natural drainage. Relief includes landform characteristics, such as position on the landform, slope gradient, slope shape, and slope aspect.

Variations in relief in the county reflect the variety of landforms. The most extensive landforms in the county are ground moraines, stream terraces, and flood plains.

Ground moraines of Illinoian age generally consist of broad, nearly level and gently sloping interfluves. The relief on ground moraines is less variable than the relief along tributaries of major streams and rivers. The areas of less variable relief are dominated by such soils as Cisne, Bluford, and Wynoose soils. Atlas and Hickory soils are examples of soils that are prevalent in areas where ground moraines are incised by tributaries of major streams and rivers.

Stream terraces occur along rivers and creeks throughout the county. They are generally nearly level and gently sloping areas that are higher than the adjacent flood plains. Banlic and Creal soils are on stream terraces in Marion County.

Where the parent material is relatively uniform, differences in natural drainage are closely related to landform position (for example, summit or backslope) and to slope gradient and slope shape. Wynoose and Ava soils, for example, both formed in loess and in the underlying pedisediment and geosol. Wynoose soils are on toeslopes. The slopes are nearly level and are commonly concave. Precipitation and runoff from the higher adjacent soils contribute to the ponding of surface water on the poorly drained Wynoose soils. The water in the saturated soil pores restricts the circulation of air in the soil. Under these conditions, naturally occurring iron and manganese compounds are chemically reduced. The reduced form of iron and manganese is more soluble than the oxidized form and can be leached readily from the soil, leaving the subsoil with a grayish color. Ava soils, conversely, are moderately well drained and are on gently sloping summits and backslopes that are convex. The water table is lower in the Ava soils, and some of the rainfall runs off the more sloping surface. The soil pores in the Ava soils contain less water and more air. The iron and manganese compounds are well oxidized, resulting in a brownish subsoil.

Relief also affects the susceptibility to and intensity of both geologic and recent accelerated erosion. Soils on the steeper slopes and in areas where slopes are long are more susceptible to erosion than soils that formed in nearly level or level areas or where slopes are short. Maintaining a cover of vegetation or plant residue on much or all of the soil surface can significantly reduce the hazard of erosion caused by relief. For example, Hickory soils that have slopes of 18 to 35 percent generally support trees, herbaceous plants, and grasses. Because of the vegetative cover, these soils are susceptible to little or no erosion. Most areas of Hickory soils that have slopes of 10 to 18 percent are cultivated. Failure to maintain erosion-control systems on these soils has resulted in moderate or severe accelerated erosion of the surface soil. The loss of surface soil material in one place results in deposition and accumulation in another place, affecting both the rate of soil formation and the development and thickness of soil horizons.

Time

To a great extent, time determines the degree of profile development in a soil. The amount of time available for soil development is strongly influenced by the degree and amount of erosion or deposition of material at any given point in the county.

The differences among soils resulting from the length of time that the parent material has been in place are commonly expressed in the degree of profile development. Wakeland soils have a very weakly expressed profile because they are on low flood plains that periodically receive new alluvial sediments. Consequently, they have not been in place long enough for the development of distinct horizons. Cisne soils, however, which are on ground moraines, are more strongly developed than the Wakeland soils. They have distinct horizons because the loess and underlying drift in which they formed have been in place a much longer time.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (Soil Survey Staff, 1999). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series.

Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 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 Udalfs (*Ud*, meaning humid, plus *alf*, from Alfisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Hapludalfs (*Hapl*, meaning minimal horizonation, plus *udalf*, the suborder of the Alfisols that has a udic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Hapludalfs.

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

SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. An example is the Hickory series.

Soil Series and Detailed Soil Map Units

In this section, arranged in alphabetical order, each major soil series recognized in the survey area is described. Each series description is followed by detailed descriptions of the associated 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) and in “Keys to Soil Taxonomy” (Soil Survey Staff, 2006). 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.

In some instances, the typical pedon for the series is located outside Marion County. The selection of typical pedons is based on the range of characteristics for the series as it occurs throughout a particular major land resource area (MLRA). The Wynoose series, for example, is common in MLRA 113 (Central Claypan Areas), which covers most of central and south-central Illinois. The typical pedon for the Wynoose series is located in Wayne County, Illinois. The soil properties of this pedon are representative of the Wynoose soils that occur not only in Wayne County but also in Marion County and other counties in MLRA 113.

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 under the headings “Use and Management of the Soils” and “Soil Properties.”

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

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

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

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

Soils that have profiles that are almost alike make up a *soil series*. All the soils of a series have major horizons that are similar in composition, thickness, and arrangement. The soils of a given series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Wakeland silt loam, 0 to 2 percent slopes, frequently flooded, is a phase of the Wakeland series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are called complexes. A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Cisne-Huey silt loams, 0 to 2 percent slopes, is an example.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Urban land is an example. Some miscellaneous areas that are too small or narrow to be mapped at the scale used for the survey are identified with a special symbol on the soil maps.

Table 5 gives the acreage and proportionate extent of each map unit. Other tables give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils or miscellaneous areas.

Atlas Series

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

Taxadjunct features: The Atlas soils in map units 7C2, 7C3, 7D2, and 7D3 have a slightly lower shrink-swell potential than is defined as the range for the series. In addition, the Atlas soils in map units 7C2 and 7D2 are slightly better drained and the Atlas soils in map units 7C3 and 7D3 are saturated in all layers from the upper boundary of saturation to a depth of 2 meters or more during the period when the water table is high. These differences, however, do not significantly affect the use and management of the soils. The Atlas soils in map units 7C2 and 7D2 are classified as fine, smectitic, mesic Aquic Hapludalfs. The Atlas soils in map units 7C3 and 7D3 are classified as fine, smectitic, mesic Aeric Endoaqualfs.

Typical Pedon

Atlas silt loam, 5 to 10 percent slopes, eroded, on a slope of 7 percent at an elevation of 528 feet above mean sea level; Crawford County, Illinois; about 300 feet north and 1,700 feet east of the southwest corner of sec. 4, T. 7 N., R. 13 W.; USGS Eaton, Illinois, topographic quadrangle; lat. 39 degrees 04 minutes 20.2 seconds N. and long. 87 degrees 51 minutes 56.8 seconds W.; UTM Zone 16S, 0425106 Easting, 4325155 Northing; NAD 83:

Ap—0 to 10 cm (0 to 4 inches); brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine subangular blocky structure parting to weak fine granular; friable; few fine and many very fine roots; few fine irregular extremely weakly cemented iron-manganese accumulations throughout; slightly acid; abrupt smooth boundary.

Bt—10 to 23 cm (4 to 9 inches); yellowish brown (10YR 5/4) and brown (10YR 4/3) silty clay loam; moderate fine subangular blocky structure; firm; few fine and many very fine roots; common faint brown (10YR 4/3) clay films on faces of peds; few fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; few fine irregular extremely weakly cemented iron-manganese accumulations throughout; strongly acid; clear smooth boundary.

2Btg1—23 to 58 cm (9 to 23 inches); gray (5Y 5/1) clay loam; weak medium prismatic structure parting to moderate medium subangular blocky; very firm; common fine and very fine roots; many distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; common medium prominent yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; few fine irregular extremely weakly cemented iron-manganese accumulations throughout; about 1 percent pebbles; strongly acid; gradual smooth boundary.

2Btg2—58 to 86 cm (23 to 34 inches); gray (5Y 5/1) clay loam; moderate medium prismatic structure; very firm; few very fine roots; many distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; common medium prominent strong brown (7.5YR 5/8) masses of oxidized iron the matrix; few fine irregular extremely weakly cemented iron-manganese accumulations throughout; about 3 percent pebbles; neutral; gradual smooth boundary.

2Btg3—86 to 132 cm (34 to 52 inches); gray (5Y 6/1) clay loam; weak medium prismatic structure; very firm; few very fine roots; common prominent dark grayish brown (2.5Y 4/2) clay films on faces of peds; common medium prominent strong brown (7.5YR 5/8) masses of oxidized iron in the matrix; few fine irregular extremely weakly cemented iron-manganese accumulations throughout; about 2 percent pebbles; neutral; gradual smooth boundary.

2Btg4—132 to 173 cm (52 to 68 inches); gray (5Y 6/1) clay loam; weak medium prismatic structure; firm; common prominent dark grayish brown (2.5Y 4/2) clay films on faces of peds; many coarse prominent strong brown (7.5YR 5/8) masses of oxidized iron in the matrix; common fine irregular extremely weakly cemented iron-manganese accumulations throughout; about 2 percent pebbles; neutral.

Range in Characteristics

Thickness of the loess: Less than 50 cm (20 inches)
Depth to carbonates: More than 150 cm (60 inches)
Depth to the base of the argillic horizon: More than 107 cm (42 inches)

Ap or A horizon:
Hue—10YR
Value—4 or 5
Chroma—1 to 4

Texture—silt loam; silty clay loam in severely eroded pedons
Content of rock fragments—0 to 5 percent
Reaction—very strongly acid to neutral

Bt horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—4 to 6
Chroma—0 to 4
Texture—clay loam, clay, silty clay loam, or silty clay
Content of rock fragments—0 to 5 percent
Reaction—very strongly acid to neutral

2Btg horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—4 to 6
Chroma—0 to 2
Texture—clay loam, clay, silty clay loam, or silty clay
Content of rock fragments—0 to 5 percent
Reaction—very strongly acid to neutral

2BCg or 2Cg horizon (where present):
Hue—7.5YR, 10YR, 2.5Y, 5Y, or N
Value—4 to 6
Chroma—0 to 6
Texture—clay loam, clay, or loam
Content of rock fragments—2 to 15 percent
Reaction—slightly acid to slightly alkaline

7C2—Atlas silt loam, 5 to 10 percent slopes, eroded

Setting

Landform: Till plains
Position on the landform: Backslopes

Map Unit Composition

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

Soils of Minor Extent

Similar soils:
- Moderately well drained soils on the steeper side slopes; in landscape positions below those of the Atlas soil
- Soils that have more sodium in the subsoil
- Soils that have less clay in the subsoil
- Soils that are severely eroded

Dissimilar soils:
- The well drained Hickory soils on the steeper side slopes; in landscape positions below those of the Atlas soil
- The poorly drained Wynoose soils in the flatter areas; in landscape positions above those of the Atlas soil

Properties and Qualities of the Atlas Soil

Parent material: Loess over a paleosol or paleo accretionary deposits
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow

Permeability below a depth of 60 inches: Slow or moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 7.8 inches to a depth of 60 inches
Content of organic matter in the surface layer: 0.5 to 2.0 percent
Shrink-swell potential: High
Apparent seasonal high water table (depth, months): 1 to 2 feet, January through May
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Hazard of corrosion: High for steel and concrete
Surface runoff class: Very high
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3e
Prime farmland category: Not prime farmland
Hydric soil status: Not hydric

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

Setting

Landform: Till plains
Position on the landform: Backslopes

Map Unit Composition

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

Soils of Minor Extent

Similar soils:
- Moderately well drained soils on the steeper side slopes; in landscape positions below those of the Atlas soil
- Soils that have less clay in the subsoil

Dissimilar soils:
- The well drained Hickory soils on the steeper side slopes; in landscape positions below those of the Atlas soil
- The poorly drained Wynoose soils in the flatter areas; in landscape positions above those of the Atlas soil
- Soils that are subject to flooding

Properties and Qualities of the Atlas Soil

Parent material: Loess over a paleosol or paleo accretionary deposits
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow or slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 7.8 inches to a depth of 60 inches
Content of organic matter in the surface layer: 0.3 to 1.0 percent
Shrink-swell potential: High

Apparent seasonal high water table (depth, months): 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Accelerated erosion: The surface layer is mostly subsoil material.
Potential for frost action: High
Hazard of corrosion: High for steel and concrete
Surface runoff class: Very high
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3e
Prime farmland category: Not prime farmland
Hydric soil status: Not hydric

7D2—Atlas silt loam, 10 to 18 percent slopes, eroded

Setting

Landform: Hillslopes on till plains
Position on the landform: Backslopes

Map Unit Composition

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

Soils of Minor Extent

Similar soils:
- Soils that have less clay in the subsoil
- Soils that have more sodium in the subsoil
- Soils that are severely eroded

Dissimilar soils:
- The well drained Hickory soils on the steeper side slopes; in landscape positions below those of the Atlas soil
- The moderately well drained Ava soils on ridges; in landscape positions above those of the Atlas soil
- Soils that are subject to flooding

Properties and Qualities of the Atlas Soil

Parent material: Loess over a paleosol or paleo accretionary deposits
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow or moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 8.4 inches to a depth of 60 inches
Content of organic matter in the surface layer: 0.5 to 2.0 percent
Shrink-swell potential: High
Apparent seasonal high water table (depth, months): 1 to 2 feet, January through May
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate

Hazard of corrosion: High for steel and concrete
Surface runoff class: Very high
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 4e
Prime farmland category: Not prime farmland
Hydric soil status: Not hydric

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

Setting

Landform: Hillslopes on till plains
Position on the landform: Backslopes

Map Unit Composition

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

Soils of Minor Extent

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

Dissimilar soils:
- The well drained Hickory soils on the steeper side slopes; in landscape positions below those of the Atlas soil
- Soils that are subject to flooding

Properties and Qualities of the Atlas Soil

Parent material: Loess over a paleosol or paleo accretionary deposits
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow or slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 7.9 inches to a depth of 60 inches
Content of organic matter in the surface layer: 0.3 to 1.0 percent
Shrink-swell potential: High
Apparent seasonal high water table (depth, months): 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Accelerated erosion: The surface layer is mostly subsoil material.
Potential for frost action: High
Hazard of corrosion: High for steel and concrete
Surface runoff class: Very high
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 4e
Prime farmland category: Not prime farmland
Hydric soil status: Not hydric

914C2—Atlas-Grantfork silt loams, 5 to 10 percent slopes, eroded

Setting

Landform: Till plains
Position on the landform: Shoulders and backslopes

Map Unit Composition

Atlas and similar soils: 50 percent
Grantfork and similar soils: 40 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

Similar soils:
- Soils that have less clay in the subsoil
- Soils that have more sodium in the subsoil
- Soils that have a darker surface layer

Dissimilar soils:
- The poorly drained Cisne soils on flats; in landscape positions above those of the Atlas soil

Properties and Qualities of the Atlas Soil

Parent material: Loess over a paleosol or paleo accretionary deposits
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow or moderately slow
Depth to restrictive feature: More than 80 inches
Sodium adsorption ratio within a depth of 30 inches: 0 to 3
Available water capacity: About 7.8 inches to a depth of 60 inches
Content of organic matter in the surface layer: 0.5 to 2.0 percent
Shrink-swell potential: High
Apparent seasonal high water table (depth, months): 1 to 2 feet, January through May
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: High
Hazard of corrosion: High for steel and concrete
Surface runoff class: Very high
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Properties and Qualities of the Grantfork Soil

Parent material: Paleosol or paleo accretionary deposits
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 5 to 10 inches to abrupt textural change
Sodium adsorption ratio within a depth of 30 inches: 5 to 13
Available water capacity: About 7.9 inches to a depth of 60 inches
Content of organic matter in the surface layer: 0.5 to 2.0 percent
Shrink-swell potential: High

Apparent seasonal high water table (depth, months): 1 to 2 feet, January through May
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Hazard of corrosion: High for steel and concrete
Surface runoff class: High
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Atlas—3e; Grantfork—3e
Prime farmland category: Not prime farmland
Hydric soil status: Atlas—not hydric; Grantfork—not hydric

Ava Series

Taxonomic classification: Fine-silty, mixed, active, mesic Oxyaquic Fragiudalfs

Typical Pedon

Ava silt loam, 2 to 5 percent slopes, on a slope of 3 percent at an elevation of 440 feet above mean sea level; Edwards County, Illinois; about 925 feet south and 1,575 feet west of the northeast corner of sec. 17, T. 1 N., R. 10 E.; USGS West Salem, Illinois, topographic quadrangle; lat. 38 degrees 30 minutes 56.5 seconds N. and long. 88 degrees 06 minutes 47.2 seconds W.; UTM Zone 16S, 0402959 Easting, 4263622 Northing; NAD 83:

Ap—0 to 15 cm (0 to 6 inches); dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; moderate fine granular structure; friable; many fine roots; slightly acid; abrupt smooth boundary.
E—15 to 25 cm (6 to 10 inches); brown (10YR 4/3) silt loam; weak medium platy structure; friable; few fine roots; strongly acid; clear smooth boundary.
BE—25 to 36 cm (10 to 14 inches); yellowish brown (10YR 5/6) silt loam; moderate fine and medium subangular blocky structure; friable; common fine roots; strongly acid; clear smooth boundary.
Bt—36 to 61 cm (14 to 24 inches); yellowish brown (10YR 5/4) silty clay loam; strong fine and medium subangular blocky structure; firm; few fine roots; very few distinct brown (7.5YR 5/4) clay films and very few faint light yellowish brown (10YR 6/4) (dry) clay depletions on faces of peds; very strongly acid; clear smooth boundary.
B/E—61 to 69 cm (24 to 27 inches); yellowish brown (10YR 5/4) silty clay loam (B) and light yellowish brown (10YR 6/4) silt (E), light gray (10YR 7/2) dry; the E material occurs as common distinct clay depletions on faces of peds and as fillings in spaces between peds; moderate fine and medium subangular blocky structure; firm; few fine roots; common medium faint brown (7.5YR 4/4) masses of oxidized iron-manganese in the matrix; few fine distinct black (10YR 2/1) manganese concretions throughout; very strongly acid; clear smooth boundary.
B´t—69 to 86 cm (27 to 34 inches); dark yellowish brown (10YR 4/4) silty clay loam; moderate medium subangular blocky structure; firm; few fine roots; common distinct brown (10YR 4/3) clay films and few distinct light gray (10YR 7/2) (dry) clay depletions on faces of peds; common fine distinct grayish brown (10YR 5/2) iron depletions and few fine distinct yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; very strongly acid; gradual smooth boundary.

2Btx1—86 to 114 cm (34 to 44 inches); grayish brown (10YR 5/2) silty clay loam; moderate very coarse prismatic structure parting to weak coarse subangular blocky; very firm; brittle; cracks between polygons filled with light gray (10YR 7/1) (dry) silt loam; common coarse prominent yellowish brown (10YR 5/8) masses of oxidized iron in the matrix; common coarse prominent dark red (2.5YR 3/6) and distinct brown (7.5YR 4/4) weakly cemented iron-manganese nodules and few fine distinct black (10YR 2/1) manganese concretions throughout; about 12 percent sand; very strongly acid; gradual smooth boundary.

2Btx2—114 to 127 cm (44 to 50 inches); brown (10YR 5/3) loam; weak very coarse prismatic structure parting to weak coarse subangular blocky; very firm; brittle; few vertical streaks and cracks between polygons filled with light gray (10YR 7/1) (dry) silt; common coarse faint dark yellowish brown (10YR 4/4) masses of oxidized iron-manganese and common fine faint grayish brown (10YR 5/2) iron depletions in the matrix; few distinct black (10YR 2/1) manganese concretions throughout; about 30 percent sand; very strongly acid; gradual smooth boundary.

2C—127 to 152 cm (50 to 60 inches); brown (10YR 5/3) loam; massive; friable; common medium faint grayish brown (10YR 5/2) iron depletions in the matrix; strongly acid.

Range in Characteristics

Thickness of the loess: 76 to 140 cm (30 to 55 inches)
Depth to the base of the argillic horizon: More than 122 cm (48 inches)
Depth to the fragipan: 64 to 102 cm (25 to 40 inches)

Ap or A horizon:
Hue—10YR
Value—4 or 5
Chroma—2 or 3
Texture—silt loam
Content of rock fragments—none
Reaction—very strongly acid to neutral

E, BE, or EB horizon (where present):
Hue—10YR
Value—4 or 5
Chroma—3 to 6
Texture—silt loam
Content of rock fragments—none
Reaction—very strongly acid or strongly acid

B, Bt, or B´t horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 to 6
Texture—silty clay loam or silt loam
Content of rock fragments—none
Reaction—very strongly acid or strongly acid

B/E or Bt/E horizon (B part):
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 to 6
Texture—silty clay loam or silt loam
Content of rock fragments—none
Reaction—very strongly acid or strongly acid

B/E or Bt/E horizon (E part):
Hue—10YR
Value—5 to 8
Chroma—1 to 4
Texture—silt or silt loam
Content of rock fragments—none
Reaction—very strongly acid or strongly acid

Btx, Bx, 2Bx, or 2Btx horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—2 to 8
Texture—silt loam, silty clay loam, loam, or clay loam
Content of rock fragments—0 to 4 percent
Reaction—very strongly acid or strongly acid

2C or 2Btb horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—2 to 6
Texture—loam, silt loam, silty clay loam, or clay loam
Content of rock fragments—0 to 5 percent
Reaction—very strongly acid to moderately acid

14B—Ava silt loam, 2 to 5 percent slopes

Setting

Landform: Till plains
Position on the landform: Summits and shoulders

Map Unit Composition

Ava and similar soils: 90 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

Similar soils:
- Soils that have a grayer subsoil

Dissimilar soils:
- The well drained Hickory soils on steep side slopes; in landscape positions below those of the Ava soil
- The poorly drained Wynoose soils in the flatter areas; in landscape positions above those of the Ava soil

Properties and Qualities of the Ava Soil

Parent material: Loess over mixed loess and drift
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Slow or moderately slow
Depth to restrictive feature: 25 to 40 inches to a fragipan
Available water capacity: About 8.4 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.0 to 2.5 percent
Shrink-swell potential: Moderate

Perched seasonal high water table (depth, months): 1.5 to 2.9 feet, February through April
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and concrete
Surface runoff class: Medium
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2e
Prime farmland category: Prime farmland
Hydric soil status: Not hydric

14C2—Ava silt loam, 5 to 10 percent slopes, eroded

Setting

Landform: Ridges on till plains
Position on the landform: Shoulders and backslopes

Map Unit Composition

Ava and similar soils: 90 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

Similar soils:
- Soils that have a grayer subsoil
- Soils that have more sand in the subsoil

Dissimilar soils:
- The well drained Hickory soils on steep side slopes; in landscape positions below those of the Ava soil
- The poorly drained Wynoose soils in the flatter areas; in landscape positions above those of the Ava soil

Properties and Qualities of the Ava Soil

Parent material: Loess over mixed loess and drift
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Slow or moderately slow
Depth to restrictive feature: 25 to 40 inches to a fragipan
Available water capacity: About 7.8 inches to a depth of 60 inches
Content of organic matter in the surface layer: 0.5 to 2.0 percent
Shrink-swell potential: Moderate
Perched seasonal high water table (depth, months): 1.5 to 2.9 feet, February through April
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: High
Hazard of corrosion: High for steel and concrete
Surface runoff class: High

Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3e
Prime farmland category: Not prime farmland
Hydric soil status: Not hydric

929D2—Ava-Hickory silt loams, 10 to 18 percent slopes, eroded

Setting

Landform: Hillslopes on till plains
Position on the landform: Shoulders and backslopes

Map Unit Composition

Ava and similar soils: 55 percent
Hickory and similar soils: 40 percent
Dissimilar soils: 5 percent

Soils of Minor Extent

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

Dissimilar soils:
- The somewhat poorly drained Bluford soils in landscape positions above those of the Ava soil
- Soils that are subject to flooding

Properties and Qualities of the Ava Soil

Parent material: Loess over mixed loess and drift
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow
Depth to restrictive feature: 25 to 40 inches to a fragipan
Available water capacity: About 6 inches to a depth of 60 inches
Content of organic matter in the surface layer: 0.5 to 2.0 percent
Shrink-swell potential: Moderate
Perched seasonal high water table (depth, months): 1.5 to 2.9 feet, February through April
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: High
Hazard of corrosion: High for steel and concrete
Surface runoff class: High
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Properties and Qualities of the Hickory Soil

Parent material: Loamy till
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderate

Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 7.3 inches to a depth of 60 inches
Content of organic matter in the surface layer: 0.5 to 2.0 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Hazard of corrosion: Moderate for steel and high for concrete
Surface runoff class: Medium
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Ava—4e; Hickory—4e
Prime farmland category: Not prime farmland
Hydric soil status: Ava—not hydric; Hickory—not hydric

Banlic Series

Taxonomic classification: Coarse-silty, mixed, active, acid, mesic Fragic Epiaquepts

Typical Pedon

Banlic silt loam, 0 to 2 percent slopes, occasionally flooded, at an elevation of 404 feet above mean sea level; Wayne County, Illinois; about 250 feet west and 460 feet south of the northeast corner of sec. 9, T. 2 S., R. 8 E.; USGS Burnt Prairie, Illinois, topographic quadrangle; lat. 38 degrees 22 minutes 14.0 seconds N. and long. 88 degrees 18 minutes 54.6 seconds W.; UTM Zone 16S, 0385112 Easting, 4247748 Northing; NAD 83:

Ap—0 to 23 cm (0 to 9 inches); brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak very fine granular structure; friable; few fine roots; neutral; abrupt smooth boundary.

E—23 to 33 cm (9 to 13 inches); brown (10YR 5/3) silt loam; weak fine subangular blocky structure; friable; few fine roots; common distinct dark grayish brown (10YR 4/2) organic coatings and common distinct light brownish gray (10YR 6/2) (dry) clay depletions on faces of peds; few fine spherical iron-manganese concretions throughout; slightly acid; clear smooth boundary.

Bg1—33 to 53 cm (13 to 21 inches); light brownish gray (10YR 6/2) silt loam; weak medium and coarse subangular blocky structure; friable; few fine roots; few fine distinct grayish brown (10YR 5/2) organic coatings and many distinct light gray (10YR 7/2) (dry) clay depletions on faces of peds; common fine prominent yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; few fine spherical iron-manganese concretions throughout; strongly acid; gradual smooth boundary.

Bg2—53 to 76 cm (21 to 30 inches); light brownish gray (10YR 6/2) silt loam; weak medium subangular blocky structure; friable; very few fine roots; many distinct light gray (10YR 7/2) (dry) clay depletions on faces of peds; common fine prominent yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; common fine and medium spherical iron-manganese concretions throughout; strongly acid; clear smooth boundary.

Bgx1—76 to 99 cm (30 to 39 inches); light brownish gray (10YR 6/2) silt loam; weak coarse subangular blocky structure; firm; slightly brittle; few very fine roots between peds; many distinct light gray (10YR 7/2) (dry) clay depletions on faces of peds; common fine prominent yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; common fine and medium spherical iron-manganese concretions throughout; strongly acid; clear smooth boundary.

Bgx2—99 to 127 cm (39 to 50 inches); light brownish gray (10YR 6/2) silt loam; weak coarse subangular blocky structure; firm; slightly brittle; few fine roots between peds; common distinct light gray (10YR 7/2) (dry) clay depletions on faces of peds; common fine prominent yellowish brown (10YR 5/8) masses of oxidized iron in the matrix; many fine and medium spherical iron-manganese concretions throughout; strongly acid; clear smooth boundary.

Cg—127 to 152 cm (50 to 60 inches); variegated light brownish gray (10YR 6/2), brown (10YR 5/3), and yellowish brown (10YR 5/6) silt loam; massive; firm; many fine spherical iron-manganese concretions throughout; moderately acid.

Range in Characteristics

Depth to the base of the cambic horizon: 114 to 165 cm (45 to 65 inches)
Depth to fragic soil properties: 38 to 91 cm (15 to 36 inches)

Ap or A horizon:
Hue—10YR
Value—3 to 5
Chroma—2 or 3
Texture—silt loam
Content of rock fragments—none
Reaction—strongly acid to slightly alkaline

E horizon:
Hue—10YR
Value—4 to 6
Chroma—2 or 3
Texture—silt loam
Content of rock fragments—none
Reaction—very strongly acid to neutral

Bg or Bw horizon:
Hue—10YR
Value—5 or 6
Chroma—2 or 3
Texture—silt loam
Content of rock fragments—none
Reaction—very strongly acid or strongly acid

Bgx or Bx horizon:
Hue—10YR or 2.5YR
Value—5 to 7
Chroma—1 to 4
Texture—silt loam or silt
Content of rock fragments—none
Reaction—very strongly acid or strongly acid

Cg or C horizon:
Hue—10YR or 2.5YR
Value—4 to 6
Chroma—1 to 6
Texture—silt loam
Content of rock fragments—none
Reaction—very strongly acid to slightly acid

8787A—Banlic silt loam, 0 to 2 percent slopes, occasionally flooded

Setting

Landform: Low stream terraces and flood-plain steps

Map Unit Composition

Banlic and similar soils: 90 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

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

Dissimilar soils:
- The poorly drained Birds and Bonnie soils in depressions

Properties and Qualities of the Banlic Soil

Parent material: Silty alluvium
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: 15 to 36 inches to fragic properties
Available water capacity: About 10.4 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.0 to 2.5 percent
Shrink-swell potential: Low
Perched seasonal high water table (depth, months): 0.5 foot to 2.0 feet, January through May
Ponding: None
Frequency and most likely period of flooding: Occasional, January through May
Potential for frost action: High
Hazard of corrosion: High for steel and concrete
Surface runoff class: Low
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3s
Prime farmland category: Prime farmland where drained
Hydric soil status: Not hydric

Belknap Series

Taxonomic classification: Coarse-silty, mixed, active, acid, mesic Fluvaquentic Endoaquepts

Typical Pedon

Belknap silt loam, 0 to 2 percent slopes, frequently flooded, at an elevation of 440 feet above mean sea level; Wabash County, Illinois; about 1,000 feet east and 1,000 feet north of the center of sec. 33, T. 2 N., R. 12 W.; USGS St. Francisville, Illinois, topographic quadrangle; lat. 38 degrees 33 minutes 52.0 seconds N. and long. 87

degrees 44 minutes 50.5 seconds W.; UTM Zone 16S, 0434887 Easting, 4268714 Northing; NAD 83:

Ap—0 to 18 cm (0 to 7 inches); dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine and medium granular structure; friable; strongly acid; abrupt smooth boundary.

A—18 to 33 cm (7 to 13 inches); dark grayish brown (10YR 4/2) silt loam; weak thin platy structure parting to weak fine granular; friable; few medium faint brown (10YR 5/3) and few fine prominent yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; strongly acid; gradual smooth boundary.

Bg—33 to 69 cm (13 to 27 inches); dark grayish brown (10YR 4/2), grayish brown (10YR 5/2), and brown (10YR 5/3) silt loam; weak medium granular structure; friable; few medium faint light brownish gray (10YR 6/2) iron depletions and common fine distinct and prominent yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; few iron-manganese concretions throughout; strongly acid; gradual smooth boundary.

Cg1—69 to 150 cm (27 to 59 inches); light brownish gray (10YR 6/2) silt loam; massive; friable; common fine prominent dark reddish brown (2.5YR 3/4) masses of oxidized iron-manganese and yellowish brown (10YR 5/8) masses of oxidized iron in the matrix; many iron-manganese concretions increasing in number and size with increasing depth; strongly acid; gradual smooth boundary.

Cg2—150 to 165 cm (59 to 65 inches); dark gray (10YR 4/1) silt loam; massive; friable; common medium faint gray (10YR 6/1) iron depletions and few medium prominent brown (7.5YR 5/4) masses of oxidized iron in the matrix; many iron-manganese concretions throughout; moderately acid.

Range in Characteristics

Depth to the base of the cambic horizon: 30 to 152 cm (12 to 60 inches)

Ap or A horizon:
Hue—10YR
Value—4 to 6
Chroma—2 or 3
Texture—silt loam
Content of rock fragments—none
Reaction—very strongly acid to moderately acid

Bg or Bw horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 4
Texture—silt loam or silt
Content of rock fragments—none
Reaction—very strongly acid or strongly acid

Cg or C horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 4
Texture—silt loam or silt
Content of rock fragments—none
Reaction—very strongly acid to moderately acid

3382A—Belknap silt loam, 0 to 2 percent slopes, frequently flooded

Setting

Landform: Flood plains

Map Unit Composition

Belknap and similar soils: 90 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

Similar soils:
- Soils that have more clay or more sand in the subsoil
- Soils that have a firm and brittle subsoil layer

Dissimilar soils:
- The poorly drained Bonnie soils in depressions

Properties and Qualities of the Belknap Soil

Parent material: Silty alluvium
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Moderately slow
Permeability below a depth of 60 inches: Moderately slow or moderate
Depth to restrictive feature: More than 80 inches
Available water capacity: About 12 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Low
Apparent seasonal high water table (depth, months): 0.5 foot to 2.0 feet, January through May
Ponding: None
Frequency and most likely period of flooding: Frequent, November through June
Potential for frost action: High
Hazard of corrosion: High for steel and concrete
Surface runoff class: Very low
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3w
Prime farmland category: Prime farmland where drained and either protected from flooding or not frequently flooded during the growing season
Hydric soil status: Not hydric

Birds Series

Taxonomic classification: Fine-silty, mixed, superactive, nonacid, mesic Typic Fluvaquents
Taxadjunct feature: The Birds soils in this survey area have slightly more development in the subsoil than is defined as the range for the series. This difference, however, does not significantly affect the use and management of the soils. These soils are classified as fine-silty, mixed, superactive, nonacid, mesic Fluvaquentic Endoaquepts.

Typical Pedon

Birds silt loam, 0 to 2 percent slopes, frequently flooded, at an elevation of 418 feet above mean sea level; Lawrence County, Illinois; about 2,643 feet south and 2,044 feet east of the northwest corner of sec. 13, T. 3 N., R. 12 W.; USGS Lawrenceville, Illinois, topographic quadrangle; lat. 38 degrees 41 minutes 42.6 seconds N. and long. 87 degrees 41 minutes 45.9 seconds W.; UTM Zone 16S, 0439467 Easting, 4283182 Northing; NAD 83:

Ap—0 to 15 cm (0 to 6 inches); dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; moderate fine granular structure; friable; few very fine roots throughout; few fine distinct dark yellowish brown (10YR 4/4) masses of oxidized iron-manganese in the matrix; few fine spherical iron-manganese concretions throughout; neutral; abrupt smooth boundary.

Bg1—15 to 33 cm (6 to 13 inches); gray (10YR 5/1) silt loam; weak fine prismatic structure; friable; few very fine roots throughout; common fine distinct dark yellowish brown (10YR 4/4) and common fine prominent strong brown (7.5YR 4/6) masses of oxidized iron-manganese in the matrix; few fine irregular extremely weakly cemented iron-manganese accumulations throughout; neutral; clear smooth boundary.

Bg2—33 to 56 cm (13 to 22 inches); light brownish gray (10YR 6/2) silt loam; weak medium prismatic structure; friable; few very fine roots throughout; few prominent black (N 2.5/) manganese coatings on faces of peds; common fine prominent yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; common fine irregular extremely weakly cemented iron-manganese accumulations throughout; neutral; clear smooth boundary.

Bg3—56 to 102 cm (22 to 40 inches); gray (10YR 6/1) silt loam; weak medium prismatic structure; friable; few very fine roots throughout; few prominent black (N 2.5/) manganese coatings on faces of peds; common fine prominent yellowish brown (10YR 5/8) masses of oxidized iron in the matrix; common fine and medium irregular extremely weakly cemented iron-manganese accumulations throughout; neutral; clear smooth boundary.

BCg—102 to 147 cm (40 to 58 inches); gray (10YR 5/1) silt loam; weak coarse prismatic structure; friable; few very fine roots throughout; very few prominent black (N 2.5/) manganese coatings on faces of peds; common fine prominent yellowish brown (10YR 5/8) masses of oxidized iron in the matrix; common fine and medium irregular extremely weakly cemented iron-manganese accumulations throughout; neutral; clear smooth boundary.

Cg—147 to 203 cm (58 to 80 inches); light brownish gray (10YR 6/2) silt loam; weak coarse prismatic structure; friable; few prominent black (N 2.5/) manganese coatings on faces of aggregates; common fine prominent yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; common fine and medium irregular extremely weakly cemented iron-manganese accumulations throughout; slightly alkaline.

Range in Characteristics

Depth to the base of the cambic horizon: 50 to 150 cm (20 to 60 inches)

Ap, A, or AC horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silt loam
Content of rock fragments—none
Reaction—moderately acid to neutral

Bg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 7
Chroma—1 or 2
Texture—silt loam
Content of rock fragments—none
Reaction—moderately acid to slightly alkaline

BCg or Cg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 7
Chroma—1 or 2
Texture—dominantly silt loam; strata of silty clay loam, clay loam, loam, or sandy loam below a depth of 40 inches in some pedons
Content of rock fragments—none
Reaction—moderately acid to slightly alkaline

3334A—Birds silt loam, 0 to 2 percent slopes, frequently flooded

Setting

Landform: Flood plains

Map Unit Composition

Birds and similar soils: 90 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

Similar soils:
- Soils that are subject to extended periods of ponding
- Soils that have more sand in the subsoil

Dissimilar soils:
- The somewhat poorly drained Wakeland soils on slight rises; in landscape positions above those of the Birds soil

Properties and Qualities of the Birds Soil

Parent material: Silty alluvium
Drainage class: Poorly drained
Slowest permeability within a depth of 40 inches: Moderately slow
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 12.6 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Low
Apparent seasonal high water table (depth, months): At the surface to 1 foot below the surface, January through May
Duration, depth, and most likely period of ponding: Brief, at the surface to 0.5 foot above the surface, January through May
Frequency and most likely period of flooding: Frequent, November through June
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Low

Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3w
Prime farmland category: Prime farmland where drained and either protected from flooding or not frequently flooded during the growing season
Hydric soil status: Hydric

Blair Series

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

Typical Pedon

Blair silty clay loam, 5 to 10 percent slopes, severely eroded, on a slope of 6 percent at an elevation of 623 feet above mean sea level; Cumberland County, Illinois; about 2,580 feet north and 400 feet west of the southeast corner of sec. 23, T. 10 N., R. 10 E.; USGS Union Center, Illinois, topographic quadrangle; lat. 39 degrees 17 minutes 48.3 seconds N. and long. 88 degrees 02 minutes 43.4 seconds W.; UTM Zone 16S, 0409855 Easting, 4350229 Northing; NAD 83:

Ap—0 to 10 cm (0 to 4 inches); brown (10YR 5/3) silty clay loam, pale brown (10YR 6/3) dry; moderate medium granular structure; friable; neutral; abrupt smooth boundary.

Bt—10 to 36 cm (4 to 14 inches); yellowish brown (10YR 5/4) silty clay loam; weak medium subangular blocky structure; friable; common distinct light brownish gray (10YR 6/2) (dry) silt coatings on faces of peds; common distinct brown (10YR 5/3) clay films on faces of peds and lining pores; common fine faint brown (7.5YR 4/4) masses of oxidized iron-manganese and common fine distinct strong brown (7.5YR 5/6) masses of oxidized iron in the matrix; very strongly acid; abrupt smooth boundary.

Btg1—36 to 51 cm (14 to 20 inches); grayish brown (10YR 5/2) silt loam; weak coarse prismatic structure parting to moderate medium subangular blocky; friable; few fine manganese coatings; common distinct light brownish gray (10YR 6/2) (dry) silt coatings and common faint grayish brown (2.5Y 5/2) clay films on faces of peds; common fine distinct yellowish brown (10YR 5/4) masses of iron-manganese and many fine prominent yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; very strongly acid; clear smooth boundary.

2Btg2—51 to 91 cm (20 to 36 inches); grayish brown (10YR 5/2) clay loam; weak coarse prismatic structure parting to moderate medium subangular blocky; friable; common fine manganese coatings; common faint dark grayish brown (10YR 4/2) and grayish brown (2.5Y 5/2) clay films on faces of peds; common medium distinct brown (7.5YR 4/4) and dark yellowish brown (10YR 4/4) masses of oxidized iron-manganese and many medium prominent strong brown (7.5YR 5/6) masses of oxidized iron in the matrix; strongly acid; clear smooth boundary.

2Btg3—91 to 107 cm (36 to 42 inches); dark grayish brown (10YR 4/2) loam; weak coarse prismatic structure parting to weak medium subangular blocky; firm; many medium manganese coatings; common faint dark grayish brown (2.5Y 4/2) clay films on faces of peds; many medium distinct dark yellowish brown (10YR 4/4) masses of oxidized iron-manganese in the matrix; common medium faint grayish brown (10YR 5/2) iron depletions in the matrix; slightly acid; clear smooth boundary.

2BCg—107 to 152 cm (42 to 60 inches); dark grayish brown (10YR 4/2) loam; weak coarse prismatic structure; firm; common medium manganese coatings; few faint very dark grayish brown (10YR 3/2) clay films on faces of peds; common fine distinct dark yellowish brown (10YR 4/4) masses of oxidized iron-manganese in the matrix; common fine faint grayish brown (10YR 5/2) iron depletions in the matrix; about 1 percent gravel; slightly acid.

Range in Characteristics

Thickness of the loess: Less than 50 cm (20 inches)
Depth to the base of the argillic horizon: 100 to 173 cm (40 to 68 inches)

Ap or A horizon:
Hue—10YR
Value—4 or 5
Chroma—2 to 4
Texture—silty clay loam
Content of rock fragments—0 to 2 percent
Reaction—very strongly acid to neutral

Bt or Btg horizon:
Hue—10YR
Value—4 to 6
Chroma—2 to 4
Texture—silty clay loam or silt loam
Content of rock fragments—0 to 2 percent
Reaction—very strongly acid to moderately acid

2Btg and 2BCg horizons:
Hue—10YR
Value—4 to 6
Chroma—1 or 2
Texture—clay loam, loam, silt loam, or silty clay loam
Content of rock fragments—0 to 10 percent
Reaction—strongly acid to slightly alkaline

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

Setting

Landform: Till plains
Position on the landform: Backslopes and shoulders

Map Unit Composition

Blair and similar soils: 90 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

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

Dissimilar soils:
- The somewhat poorly drained Darmstadt soils, which have more sodium in the subsoil than the Blair soil

Properties and Qualities of the Blair Soil

Parent material: Silty water-worked sediments over a paleosol that formed in till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Moderately slow
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 7.9 inches to a depth of 60 inches
Content of organic matter in the surface layer: 0.3 to 1.0 percent
Shrink-swell potential: Moderate
Apparent seasonal high water table (depth, months): 1 to 2 feet, January through May
Ponding: None
Flooding: None
Accelerated erosion: The surface layer is mostly subsoil material.
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3e
Prime farmland category: Not prime farmland
Hydric soil status: Not hydric

Bluford Series

Taxonomic classification: Fine, smectitic, mesic Aeric Fragic Epiaqualfs

Typical Pedon

Bluford silt loam, 0 to 2 percent slopes, at an elevation of 549 feet above mean sea level; Crawford County, Illinois; about 1,585 feet south and 925 feet west of the northeast corner of sec. 16, T. 8 N., R. 13 W.; USGS Annapolis, Illinois, topographic quadrangle; lat. 39 degrees 08 minutes 22.7 seconds N. and long. 87 degrees 51 minutes 27.9 seconds W.; UTM Zone 16S, 0425872 Easting, 4332623 Northing; NAD 83:

Ap—0 to 18 cm (0 to 7 inches); brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; moderate medium granular structure; very friable; few very fine roots; few fine spherical extremely weakly cemented iron-manganese accumulations throughout; neutral; abrupt smooth boundary.
E1—18 to 38 cm (7 to 15 inches); light brownish gray (10YR 6/2) silt loam, white (2.5Y 8/1) dry; moderate medium platy structure; very friable; few very fine roots; many medium distinct yellowish brown (10YR 5/4) and few medium faint brown (10YR 5/3) masses of oxidized iron-manganese in the matrix; common fine spherical extremely weakly cemented iron-manganese accumulations throughout; very strongly acid; clear smooth boundary.
E2—38 to 51 cm (15 to 20 inches); pale brown (10YR 6/3) silt loam, pale yellow (2.5Y 8/2) dry; moderate medium platy structure parting to moderate very fine subangular blocky; very friable; few very fine roots; common prominent white (10YR 8/1) (dry) clay depletions on faces of peds; common medium faint grayish brown (10YR 5/2) iron depletions in the matrix; very strongly acid; clear smooth boundary.

Btg—51 to 89 cm (20 to 35 inches); grayish brown (10YR 5/2) silty clay; moderate medium subangular blocky structure; firm; few very fine roots; common faint grayish brown (10YR 5/2) clay films on faces of peds; common medium faint gray (10YR 5/1) iron depletions in the matrix; common medium distinct dark yellowish brown (10YR 4/4) masses of oxidized iron-manganese and many medium prominent yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; common prominent strong brown (7.5YR 5/6) masses of oxidized iron on faces of peds and in pores; few fine spherical extremely weakly cemented iron-manganese accumulations throughout; very strongly acid; clear smooth boundary.

2Btgx—89 to 107 cm (35 to 42 inches); grayish brown (10YR 5/2) silty clay loam; moderate coarse prismatic structure; firm; brittle; few faint grayish brown (10YR 5/2) clay films and common prominent white (10YR 8/1) (dry) silt coatings on faces of peds; few fine faint gray (10YR 6/1) iron depletions and common medium distinct dark yellowish brown (10YR 4/4) masses of oxidized iron-manganese in the matrix; common prominent strong brown (7.5YR 5/6) masses of oxidized iron on faces of peds and in pores; few fine spherical extremely weakly cemented iron-manganese accumulations throughout; very strongly acid; gradual smooth boundary.

2Btg—107 to 152 cm (42 to 60 inches); gray (10YR 5/1) silty clay loam; weak coarse prismatic structure; very firm; few faint dark gray (10YR 4/1) clay films in root channels; common medium distinct yellowish brown (10YR 5/4) and common medium prominent yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; common fine spherical extremely weakly cemented iron-manganese accumulations throughout; about 1 percent gravel; very strongly acid.

Range in Characteristics

Thickness of the loess: 76 to 140 cm (30 to 55 inches)
Depth to the base of the argillic horizon: More than 102 cm (40 inches)
Depth to the fragic layer: 76 to 140 cm (30 to 55 inches)

Ap or A horizon:
Hue—10YR
Value—3 to 5
Chroma—1 to 3
Texture—silt loam
Content of rock fragments—none
Reaction—very strongly acid to neutral

E, EB, or BE horizon (where present):
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 4
Texture—silt loam
Content of rock fragments—none
Reaction—very strongly acid to neutral

Bt or Btg horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 3
Texture—silty clay loam or silty clay
Content of rock fragments—none
Reaction—very strongly acid to slightly acid

2Btgx or 2Bgx horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—1 to 8
Texture—silt loam, loam, silty clay loam, or clay loam
Content of rock fragments—0 to 5 percent
Reaction—very strongly acid to moderately acid

2Btg, 2BCtg, or 2BCg horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 6
Texture—silty clay loam, silt loam, or loam
Content of rock fragments—0 to 5 percent
Reaction—very strongly acid to moderately acid

3Agb or 3Btgb horizon (where present):
Hue—7.5YR, 10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silty clay loam, clay loam, silt loam, or loam
Content of rock fragments—0 to 5 percent
Reaction—moderately acid to slightly alkaline

13A—Bluford silt loam, 0 to 2 percent slopes

Setting

Landform: Till plains
Position on the landform: Summits

Map Unit Composition

Bluford and similar soils: 90 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

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

Dissimilar soils:
- The moderately well drained Ava soils on ridges and knolls; in landscape positions above those of the Bluford soil
- The poorly drained Wynoose and Cisne soils in swales

Properties and Qualities of the Bluford Soil

Parent material: Loess over mixed loess and drift
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 30 to 55 inches to fragic properties
Available water capacity: About 9 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.0 to 2.5 percent
Shrink-swell potential: High
Perched seasonal high water table (depth, months): 0.5 foot to 2.0 feet, January through May

Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and concrete
Surface runoff class: Low
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2w
Prime farmland category: Prime farmland where drained
Hydric soil status: Not hydric

13B—Bluford silt loam, 2 to 5 percent slopes

Setting

Landform: Till plains
Position on the landform: Summits, shoulders, and backslopes

Map Unit Composition

Bluford and similar soils: 90 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

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

Dissimilar soils:
- The moderately well drained Ava soils on ridges and knolls; in landscape positions above those of the Bluford soil
- The poorly drained Wynoose and Cisne soils in depressions and on flats; in landscape positions below those of the Bluford soil

Properties and Qualities of the Bluford Soil

Parent material: Loess over mixed loess and drift
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 30 to 55 inches to fragic properties
Available water capacity: About 9.1 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.0 to 2.5 percent
Shrink-swell potential: High
Perched seasonal high water table (depth, months): 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and concrete
Surface runoff class: Medium
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2e
Prime farmland category: Prime farmland
Hydric soil status: Not hydric

13B2—Bluford silt loam, 2 to 5 percent slopes, eroded

Setting

Landform: Till plains
Position on the landform: Shoulders and backslopes

Map Unit Composition

Bluford and similar soils: 90 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

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

Dissimilar soils:
- The poorly drained Wynoose and Cisne soils on flats; in landscape positions above those of the Bluford soil

Properties and Qualities of the Bluford Soil

Parent material: Loess over mixed loess and drift
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 30 to 55 inches to fragic properties
Available water capacity: About 9 inches to a depth of 60 inches
Content of organic matter in the surface layer: 0.5 to 2.0 percent
Shrink-swell potential: Very high
Perched seasonal high water table (depth, months): 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: High
Hazard of corrosion: High for steel and concrete
Surface runoff class: Medium
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2e
Prime farmland category: Prime farmland
Hydric soil status: Not hydric

Bonnie Series

Taxonomic classification: Fine-silty, mixed, active, acid, mesic Typic Fluvaquents
Taxadjunct feature: The Bonnie soil in map unit 3108T has more development than is defined as the range for the series. This difference, however, does not

significantly affect the use and management of the soil. This soil is classified as a fine-silty, mixed, active, acid, mesic Sodic Vermaquept.

Typical Pedon

Bonnie silt loam, sodic, 0 to 2 percent slopes, frequently flooded, at an elevation of 425 feet above mean sea level; Wayne County, Illinois; about 290 feet east and 770 feet north of the center of sec. 4, T. 1 S., R. 5 E.; USGS Shields, Illinois, topographic quadrangle; lat. 38 degrees 28 minutes 12.2 seconds N. and long. 88 degrees 39 minutes 03.2 seconds W.; UTM Zone 16S, 0355982 Easting, 4259261 Northing; NAD 83:

Ap1—0 to 20 cm (0 to 8 inches); brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine granular structure; friable; common very fine and fine roots; few fine prominent strong brown (7.5YR 4/6) masses of oxidized iron-manganese throughout; few fine and medium spherical concretions with centers of distinct black (10YR 2/1) manganese and exteriors of distinct strong brown (7.5YR 5/6) oxidized iron in the matrix; slightly acid; abrupt smooth boundary.

Ap2—20 to 30 cm (8 to 12 inches); 60 percent light brownish gray (2.5Y 6/2) and 40 percent brown (10YR 5/3) silt loam; weak fine granular structure; friable; common very fine roots; common medium prominent strong brown (7.5YR 5/6) masses of oxidized iron and many medium faint and distinct dark yellowish brown (10YR 4/4) masses of oxidized iron-manganese throughout; few fine and medium spherical concretions with centers of prominent and distinct black (10YR 2/1) manganese and exteriors of prominent and distinct strong brown (7.5YR 5/6) oxidized iron in the matrix; neutral; abrupt smooth boundary.

Eg—30 to 59 cm (12 to 23 inches); 50 percent grayish brown (10YR 5/2) and 50 percent brown (10YR 5/3) silt loam; weak fine subangular blocky structure; friable; few very fine roots; common prominent white (2.5Y 8/1) clay depletions in the matrix, on faces of peds, and lining pores; common medium prominent strong brown (7.5YR 5/6) masses of oxidized iron and common coarse faint and prominent dark yellowish brown (10YR 4/4) masses of oxidized iron-manganese throughout; common fine and medium spherical concretions with centers of distinct black (10YR 2/1) manganese and exteriors of prominent and distinct strong brown (7.5YR 5/6) oxidized iron in the matrix; strongly acid; clear wavy boundary.

Eg/Btng1—59 to 97 cm (23 to 38 inches); 75 percent light brownish gray (10YR 6/2) tongues of silt loam and 25 percent light brownish gray (10YR 6/2) silty clay loam; the combined texture of the layer is silt loam; weak medium subangular blocky structure (Eg) and weak fine prismatic structure (Btng); friable; few very fine roots; few prominent dark gray (10YR 4/1) cup-shaped silty clay accumulations (1 to 2 millimeters thick and 2 to 8 centimeters across) at the base of Eg tongues (vertical tubular krotovinas); few faint brown (10YR 5/3) clay films lining root channels and pores; common distinct white (2.5Y 8/1) clay depletions in the matrix, on faces of peds, and lining pores; common medium prominent yellowish brown (10YR 5/6) masses of oxidized iron and common coarse distinct dark yellowish brown (10YR 4/4) masses of oxidized iron-manganese in the matrix and at the base of Eg tongues as cup-shaped rinds; few coarse and common fine and medium spherical concretions with centers of prominent black (10YR 2/1) manganese and exteriors of prominent strong brown (7.5YR 5/6) oxidized iron in the matrix; very strongly acid; gradual broken boundary.

2Eg/Btng2—97 to 130 cm (38 to 51 inches); 50 percent light brownish gray (10YR 6/2) silt loam and 50 percent light brownish gray (10YR 6/2) silty clay loam; the combined texture of the layer is silt loam; weak medium and coarse subangular blocky structure (Eg) and weak fine prismatic structure (Btng); friable; few very fine roots; common prominent dark gray (10YR 4/1) cup-shaped silty clay accumulations (2 to 3 millimeters thick and 2 to 8 centimeters across) at the base of Eg tongues (vertical tubular krotovinas); few faint brown (10YR 5/3) clay films lining root channels and pores; common distinct white (2.5Y 8/1) clay depletions in the matrix, on faces of peds, and lining pores; common fine prominent yellowish brown (10YR 5/6) masses of oxidized iron and common coarse distinct dark yellowish brown (10YR 4/4) masses of oxidized iron-manganese throughout; few coarse, common medium, and many fine spherical concretions with centers of prominent black (10YR 2/1) manganese and exteriors of prominent strong brown (7.5YR 5/6) oxidized iron in the matrix; few medium and coarse distinct white (2.5Y 8/1) irregular masses and reticulate crystals infused in the matrix adjacent to pores; very strongly acid; gradual broken boundary.

2Btng/Eg1—130 to 163 cm (51 to 64 inches); 60 percent gray (10YR 6/1) silty clay loam and 40 percent white (2.5Y 8/1) silt loam; the combined texture of the layer is silt loam; weak medium prismatic structure (Btng) and weak medium and coarse subangular blocky structure (Eg); friable; few very fine roots; common prominent dark gray (10YR 4/1) cup-shaped silty clay accumulations (3 to 7 millimeters thick and 2 to 8 centimeters across) at the base of Eg tongues (vertical tubular krotovinas); few distinct brown (10YR 5/3) clay films lining root channels and pores; common distinct white (2.5Y 8/1) clay depletions in the matrix, on faces of peds, and lining pores; common medium and coarse prominent strong brown (7.5YR 5/6) masses of oxidized iron throughout; common fine and medium spherical concretions with centers of prominent black (10YR 2/1) manganese and exteriors of prominent yellowish red (5YR 4/6) oxidized iron-manganese in the matrix; few medium and coarse distinct and faint white (2.5Y 8/1) irregular masses and reticulate crystals infused in the matrix adjacent to pores; strongly acid; gradual irregular boundary.

3Btng/Eg2—163 to 193 cm (64 to 76 inches); 75 percent gray (10YR 6/1) silty clay loam and 25 percent gray (10YR 6/1) silt loam; the combined texture of the layer is silty clay loam; moderate medium prismatic structure (Btng) and weak medium and coarse subangular blocky structure (Eg); firm; few very fine roots; common prominent dark gray (10YR 4/1) cup-shaped silty clay accumulations (5 to 10 millimeters thick and 2 to 8 centimeters across) at the base of Eg tongues (vertical tubular krotovinas); common distinct brown (10YR 5/3) clay films on faces of peds and lining pores; common distinct white (2.5Y 8/1) clay depletions in the matrix, on faces of peds, and lining pores; common medium prominent black (10YR 2/1) mangans lining root channels and pores; common medium prominent yellowish brown (10YR 5/8) masses of oxidized iron throughout; common fine and medium spherical concretions with centers of prominent black (10YR 2/1) manganese and exteriors of distinct yellowish red (5YR 4/6) oxidized iron-manganese in the matrix; few medium and coarse distinct white (2.5Y 8/1) irregular masses and reticulate crystals infused in the matrix adjacent to pores; neutral; abrupt irregular boundary.

3Btng—193 to 244 cm (76 to 96 inches); gray (10YR 6/1) silty clay loam; moderate medium prismatic structure; firm; few very fine roots; few distinct dark gray (10YR 4/1) clay films lining root channels and pores; common distinct white (2.5Y 8/1) clay depletions in the matrix, on faces of peds, and lining pores; common medium prominent black (10YR 2/1) mangans lining root channels and pores; common coarse prominent yellowish brown (10YR 5/8) masses of oxidized iron and common coarse distinct dark yellowish brown (10YR 4/4) masses of oxidized iron-manganese throughout; common fine spherical concretions with centers of prominent black (10YR 2/1) manganese and exteriors of prominent yellowish red (5YR 4/6) oxidized iron-manganese in the matrix; few medium and coarse distinct white (2.5Y 8/1) irregular masses and reticulate crystals infused in the matrix adjacent to pores; neutral.

Range in Characteristics

Depth to the top of the natric horizon: 150 to 200 cm (60 to 79 inches)
Depth to top of 50 percent or more recognizable bioturbation: 50 to 75 cm (20 to 30 inches)

Ap or A horizon:
Hue—10YR or 2.5Y
Value—3 to 6 moist; 6 or 7 dry
Chroma—1 to 3
Texture—silt loam; less than 10 percent sand and more than 18 percent clay
Content of rock fragments—0 to 5 percent
Sodium adsorption ratio—0 to 3
Reaction—very strongly acid to neutral

E or Eg horizon:
Hue—10YR or 2.5Y
Value—5 to 7
Chroma—1 to 3
Texture—silt loam; less than 10 percent sand and more than 18 percent clay
Content of rock fragments—0 to 5 percent
Sodium adsorption ratio—1 to 3
Reaction—very strongly acid to slightly acid

Eg/Btng horizon:
Hue—10YR or 2.5Y
Value—5 to 7
Chroma—1 or 2
Texture—silt loam (Eg); silt loam or silty clay loam (Btng)
Content of rock fragments—0 to 5 percent
Sodium adsorption ratio—1 to 6
Reaction—very strongly acid to slightly acid

2Eg/Btng and 2Btng/Eg horizons:
Hue—10YR, 2.5Y, or 5Y
Value—5 to 8
Chroma—1 or 2
Texture—silt loam (Eg); silt loam or silty clay loam (Btng)
Content of rock fragments—0 to 5 percent
Sodium adsorption ratio—6 to 13
Reaction—very strongly acid or strongly acid

3Btng/Eg horizon (where present):
Hue—10YR, 2.5Y, 5Y, or N
Value—5 to 8
Chroma—0 to 2
Texture—silty clay loam (Btng); silt loam (Eg)
Content of rock fragments—0 to 5 percent
Sodium adsorption ratio—13 to 20
Reaction—slightly acid or neutral

3Btng horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—5 to 7

Chroma—0 to 2
Texture—silty clay loam
Content of rock fragments—0 to 5 percent
Sodium adsorption ratio—13 to 20
Reaction—neutral or slightly alkaline

3108A—Bonnie silt loam, 0 to 2 percent slopes, frequently flooded

Setting

Landform: Flood plains

Map Unit Composition

Bonnie and similar soils: 90 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

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

Dissimilar soils:
- The somewhat poorly drained Belknap soils on slight rises; in landscape positions above those of the Bonnie soil

Properties and Qualities of the Bonnie Soil

Parent material: Alluvium
Drainage class: Poorly drained
Slowest permeability within a depth of 40 inches: Moderately slow
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 12.6 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Low
Apparent seasonal high water table (depth, months): At the surface to 1 foot below the surface, January through June
Duration, depth, and most likely period of ponding: Brief, at the surface to 1 foot above the surface, January through June
Frequency and most likely period of flooding: Frequent, January through June
Potential for frost action: High
Hazard of corrosion: High for steel and concrete
Surface runoff class: Low
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3w
Prime farmland category: Prime farmland where drained and either protected from flooding or not frequently flooded during the growing season
Hydric soil status: Hydric

3108T—Bonnie silt loam, sodic, 0 to 2 percent slopes, frequently flooded

Setting

Landform: Flood plains

Map Unit Composition

Bonnie and similar soils: 90 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

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

Dissimilar soils:
- The somewhat poorly drained Belknap soils on slight rises; in landscape positions above those of the Bonnie soil

Properties and Qualities of the Bonnie Soil

Parent material: Silty alluvium and/or loess over glaciolacustrine deposits
Drainage class: Poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: More than 80 inches
Sodium adsorption ratio within a depth of 30 inches: 1 to 13
Available water capacity: About 11.4 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Apparent seasonal high water table (depth, months): At the surface to 1 foot below the surface, January through May
Duration, depth, and most likely period of ponding: Brief, at the surface to 1 foot above the surface, January through May
Frequency and most likely period of flooding: Frequent, November through June
Potential for frost action: High
Hazard of corrosion: High for steel and concrete
Surface runoff class: Low
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3w
Prime farmland category: Prime farmland where drained and either protected from flooding or not frequently flooded during the growing season
Hydric soil status: Hydric

Cisne Series

Taxonomic classification: Fine, smectitic, mesic Mollic Albaqualfs

Typical Pedon

Cisne silt loam, 0 to 2 percent slopes, at an elevation of 556 feet above mean sea level; Jasper County, Illinois; about 1,960 feet west and 420 feet south of the northeast corner of sec. 3, T. 6 N., R. 9 E.; USGS Newton, Illinois, topographic quadrangle; lat. 38 degrees 59 minutes 36.6 seconds N. and long. 88 degrees 11 minutes 42.9 seconds W.; UTM Zone 16S, 0396490 Easting, 4316734 Northing; NAD 83:

Ap—0 to 20 cm (0 to 8 inches); very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; few very dark gray (10YR 3/1) organic coatings on faces of peds; about 1 percent fine and medium weakly cemented iron-manganese nodules throughout; moderately acid; abrupt smooth boundary.

Eg1—20 to 33 cm (8 to 13 inches); grayish brown (10YR 5/2) silt loam, light gray (10YR 7/2) dry; moderate medium platy structure; friable; common fine prominent yellowish brown (10YR 5/8) masses of oxidized iron in the matrix; about 2 percent fine and medium weakly cemented iron-manganese nodules throughout; strongly acid; clear smooth boundary.

Eg2—33 to 43 cm (13 to 17 inches); light gray (10YR 7/2) and light brownish gray (10YR 6/2) silt loam, very pale brown (10YR 8/2) dry; moderate medium platy structure; friable; about 2 percent fine and medium weakly cemented iron-manganese nodules throughout; strongly acid; abrupt smooth boundary.

Bg/E—43 to 48 cm (17 to 19 inches); gray (10YR 6/1) silty clay loam (Bg); moderate fine angular blocky structure; friable; common prominent light gray (10YR 7/1) (dry) clay depletions on faces of peds (E); common medium prominent yellowish red (5YR 4/6) masses of oxidized iron in the matrix; about 3 percent fine and medium weakly cemented iron-manganese nodules throughout; strongly acid; clear smooth boundary.

Btg1—48 to 71 cm (19 to 28 inches); grayish brown (10YR 5/2) silty clay loam; strong fine prismatic structure parting to strong fine angular blocky; firm; many distinct gray (10YR 5/1) clay films on faces of peds; common medium prominent yellowish red (5YR 4/6) masses of oxidized iron in the matrix; strongly acid; clear smooth boundary.

Btg2—71 to 94 cm (28 to 37 inches); grayish brown (10YR 5/2) silty clay loam; moderate medium angular blocky structure; firm; common distinct gray (10YR 5/1) clay films on faces of peds; common medium distinct dark yellowish brown (10YR 4/4) masses of oxidized iron-manganese in the matrix; strongly acid; clear smooth boundary.

2Btg3—94 to 109 cm (37 to 43 inches); light brownish gray (2.5Y 6/2) silty clay loam; weak coarse angular blocky structure; firm; few faint gray (10YR 5/1) clay films on faces of peds; common medium and coarse distinct dark yellowish brown (10YR 4/4) masses of oxidized iron-manganese in the matrix; about 15 percent sand; few pebbles; strongly acid; gradual smooth boundary.

2BCg—109 to 152 cm (43 to 60 inches); light brownish gray (2.5Y 6/2) silty clay loam; weak coarse angular blocky structure; firm; common coarse distinct dark yellowish brown (10YR 4/4) masses of oxidized iron-manganese in the matrix; about 15 percent sand in the upper part (the content of sand increases with increasing depth); few pebbles; moderately acid; gradual smooth boundary.

2Cg—152 to 203 cm (60 to 80 inches); dark grayish brown (10YR 4/2) silt loam; massive; firm; many coarse prominent gray (N 6/) and light gray (N 7/) iron depletions in the matrix; few fine and medium iron-manganese concretions throughout; about 20 percent sand; about 2 percent pebbles; slightly acid.

Range in Characteristics

Thickness of the mollic layer: 18 to 23 cm (7 to 9 inches)
Thickness of the loess: 76 to 140 cm (30 to 55 inches)
Depth to the base of the argillic horizon: 102 to 165 cm (40 to 65 inches)

Ap or A horizon:
Hue—10YR
Value—2 to 3
Chroma—1 to 3
Texture—silt loam
Content of rock fragments—none
Reaction—strongly acid to slightly alkaline

Eg horizon:
Hue—10YR or 2.5Y
Value—4 to 7
Chroma—1 or 2
Texture—silt loam or silt
Content of rock fragments—none
Reaction—very strongly acid to neutral

Btg/E, BEg, or EBg horizon (where present):
Hue—10YR or 2.5Y
Value—5 or 6
Chroma—1 or 2
Texture—silt loam or silty clay loam
Content of rock fragments—none
Reaction—very strongly acid to moderately acid

Btg horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 or 2
Texture—silty clay loam or silty clay
Content of rock fragments—none
Reaction—very strongly acid to moderately acid

2Btg, 2BCtg, or 2BCg horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 or 2
Texture—silty clay loam, clay loam, loam, or silt loam
Content of rock fragments—0 to 10 percent
Reaction—strongly acid to slightly acid

2Cg, 3Ab, or 3Btb horizon (where present):
Hue—10YR or 2.5Y
Value—3 to 6
Chroma—1 or 2
Texture—silty clay loam, clay loam, loam, or silt loam
Content of rock fragments—2 to 15 percent
Reaction—moderately acid to neutral

2A—Cisne silt loam, 0 to 2 percent slopes

Setting

Landform: Till plains

Map Unit Composition

Cisne and similar soils: 90 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

Similar soils:
- Soils that have a thicker dark surface layer
- Soils that have less clay in the subsoil

Dissimilar soils:
- The somewhat poorly drained Darmstadt and Hoyleton soils on ridges and knolls; in landscape positions above those of the Cisne soil
- The poorly drained Huey soils in depressions

Properties and Qualities of the Cisne Soil

Parent material: Loess over mixed loess and drift
Drainage class: Poorly drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Slow or moderately slow
Depth to restrictive feature: 16 to 21 inches to abrupt textural change
Available water capacity: About 9.8 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.5 to 3.5 percent
Shrink-swell potential: High
Apparent seasonal high water table (depth, months): At the surface to 1 foot below the surface, January through May
Duration, depth, and most likely period of ponding: Brief, at the surface to 0.5 foot above the surface, January through May
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3w
Prime farmland category: Prime farmland where drained
Hydric soil status: Hydric

991A—Cisne-Huey silt loams, 0 to 2 percent slopes

Setting

Landform: Till plains
Position on the landform: Summits

Map Unit Composition

Cisne and similar soils: 50 percent
Huey and similar soils: 40 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

Similar soils:
- Soils that have a thicker dark surface layer
- Soils that have less clay in the subsoil

Dissimilar soils:
- The somewhat poorly drained Darmstadt and Hoyleton soils on ridges and knolls; in landscape positions above those of the Cisne soil

Properties and Qualities of the Cisne Soil

Parent material: Loess over mixed loess and drift
Drainage class: Poorly drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Slow or moderately slow
Depth to restrictive feature: 16 to 21 inches to abrupt textural change
Sodium adsorption ratio within a depth of 30 inches: 0 to 5
Available water capacity: About 9.8 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.5 to 3.5 percent
Shrink-swell potential: High
Apparent seasonal high water table (depth, months): At the surface to 1 foot below the surface, January through May
Duration, depth, and most likely period of ponding: Brief, at the surface to 0.5 foot above the surface, January through May
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Properties and Qualities of the Huey Soil

Parent material: Loess over mixed loess and drift
Drainage class: Poorly drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow to moderately slow
Depth to restrictive feature: 8 to 16 inches to a natric horizon
Sodium adsorption ratio within a depth of 30 inches: 13 to 30
Available water capacity: About 10.1 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.0 to 2.5 percent
Shrink-swell potential: Moderate
Apparent seasonal high water table (depth, months): At the surface to 1 foot below the surface, January through May
Duration, depth, and most likely period of ponding: Brief, at the surface to 0.5 foot above the surface, January through May
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Cisne—3w; Huey—3w
Prime farmland category: Not prime farmland
Hydric soil status: Cisne—hydric; Huey—hydric

Creal Series

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

Typical Pedon

Creal silt loam, 2 to 5 percent slopes, rarely flooded, at an elevation of 453 feet above mean sea level; Marion County, Illinois; about 1,485 feet north and 2,350 feet west of the southeast corner of sec. 13, T. 1 N., R. 4 E.; USGS Orchardville, Illinois, topographic quadrangle; lat. 38 degrees 31 minutes 21.2 seconds N. and long. 88 degrees 42 minutes 25.9 seconds W.; UTM Zone 16S, 0351177 Easting, 4265177 Northing; NAD 83:

Ap—0 to 15 cm (0 to 6 inches); brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak very fine and fine granular structure; friable; common fine distinct dark yellowish brown (10YR 4/6) masses of oxidized iron-manganese and common fine distinct gray (10YR 5/1) iron depletions in the matrix; few medium and common fine spherical dark iron-manganese nodules throughout; neutral; abrupt smooth boundary.

E1—15 to 23 cm (6 to 9 inches); pale brown (10YR 6/3) silt loam; weak fine and medium granular structure; friable; common fine distinct dark yellowish brown (10YR 4/6) masses of oxidized iron-manganese and many fine distinct yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; common fine distinct gray (10YR 5/1) iron depletions in the matrix; few medium and common fine spherical dark iron-manganese nodules throughout; moderately acid; clear smooth boundary.

E2—23 to 51 cm (9 to 20 inches); brown (10YR 5/3) silt loam; weak medium angular blocky structure parting to weak fine and very fine angular blocky; friable; few fine distinct dark yellowish brown (10YR 4/6) masses of oxidized iron-manganese and many fine distinct yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; common fine distinct gray (10YR 6/1) iron depletions in the matrix; common fine and medium spherical dark iron-manganese nodules throughout; strongly acid; clear smooth boundary.

BEg—51 to 69 cm (20 to 27 inches); grayish brown (10YR 5/2) silt loam; moderate fine and very fine prismatic structure; friable; common fine prominent dark yellowish brown (10YR 4/6) masses of oxidized iron-manganese in the matrix; few medium and common fine spherical dark iron-manganese nodules throughout; strongly acid; abrupt smooth boundary.

Btg—69 to 112 cm (27 to 44 inches); light brownish gray (10YR 6/2) silty clay loam; moderate medium and fine prismatic structure; friable; many distinct grayish brown (10YR 5/2) clay films and common distinct light gray (10YR 7/2) (dry) clay depletions on faces of peds and on surfaces along pores; many fine prominent strong brown (7.5YR 5/6) masses of oxidized iron in the matrix; few medium and common fine spherical dark iron-manganese nodules throughout; strongly acid; gradual smooth boundary.

BCtg—112 to 152 cm (44 to 60 inches); yellowish brown (10YR 5/6) and grayish brown (10YR 5/2) silty clay loam; weak coarse prismatic structure; firm; few distinct dark grayish brown (10YR 4/2) clay films and very few distinct white (10YR 8/1) (dry) silt coatings on surfaces along pores; common fine prominent and faint gray (10YR 6/1) iron depletions in the matrix; few medium and common fine spherical dark iron-manganese nodules throughout; strongly acid.

Range in Characteristics

Thickness of the loess and silty alluvium: 115 to 200 cm (45 to 80 inches)
Depth to carbonates: More than 150 cm (60 inches)
Depth to the base of the argillic horizon: More than 115 cm (45 inches)

Ap or A horizon:
Hue—10YR
Value—4 or 5
Chroma—2 or 3
Texture—silt loam

Content of rock fragments—none
Reaction—strongly acid to neutral

E, Eg, or BEg horizon:
Hue—10YR
Value—4 to 6
Chroma—2 to 4
Texture—silt loam
Content of rock fragments—none
Reaction—very strongly acid to moderately acid

Bt or Btg horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 4
Texture—silt loam or silty clay loam
Content of rock fragments—none
Reaction—very strongly acid to slightly acid

BCg, 2Btg, or 2BCg horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 4
Texture—silt loam or silty clay loam
Content of rock fragments—none
Reaction—very strongly acid to neutral

7337B—Creal silt loam, 2 to 5 percent slopes, rarely flooded

Setting

Landform: Low stream terraces
Position on the landform: Footslopes

Map Unit Composition

Creal and similar soils: 90 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

Similar soils:
- Soils that are subject to more frequent flooding

Dissimilar soils:
- The moderately well drained Ava soils in landscape positions above those of the Creal soil

Properties and Qualities of the Creal Soil

Parent material: Mixture of loess and silty local alluvium
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Moderately slow
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 10.7 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.0 to 2.5 percent
Shrink-swell potential: Moderate

Apparent seasonal high water table (depth, months): 1 to 3 feet, January through May
Ponding: None
Frequency and most likely period of flooding: Rare, January through June
Potential for frost action: High
Hazard of corrosion: High for steel and concrete
Surface runoff class: Low
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2e
Prime farmland category: Prime farmland where drained
Hydric soil status: Not hydric

Darmstadt Series

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

Typical Pedon

Darmstadt silt loam, in an area of Hoyleton-Darmstadt silt loams, 0 to 2 percent slopes, at an elevation of 505 feet above mean sea level; Marion County, Illinois; about 270 feet south and 675 feet east of the center of sec. 1, T. 1 N., R. 1 E.; USGS Centralia East, Illinois, topographic quadrangle; lat. 38 degrees 33 minutes 11.4 seconds N. and long. 89 degrees 02 minutes 21.0 seconds W.; UTM Zone 16S, 0322312 Easting, 4269164 Northing; NAD 83:

Ap—0 to 15 cm (0 to 6 inches); dark grayish brown (10YR 4/2) silt loam; weak medium and coarse granular structure; friable; common fine and medium spherical iron-manganese nodules throughout; neutral; abrupt smooth boundary.

E1—15 to 25 cm (6 to 10 inches); grayish brown (10YR 5/2) silt loam; weak medium platy structure; friable; common faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; common fine and medium irregular manganese coatings; common fine and medium spherical iron-manganese nodules throughout; common medium distinct brown (7.5YR 4/4) masses of oxidized iron-manganese in the matrix; neutral; clear smooth boundary.

E2—25 to 36 cm (10 to 14 inches); light brownish gray (10YR 6/2) silt loam; weak medium platy structure; friable; common faint dark grayish brown (10YR 4/2) organic coatings on faces of peds; common fine and medium irregular manganese coatings; common fine and medium spherical iron-manganese nodules throughout; many medium faint brown (10YR 5/3) masses of oxidized iron-manganese in the matrix; few medium and coarse prominent strong brown (7.5YR 5/6) masses of oxidized iron in the matrix; slightly acid; abrupt smooth boundary.

Bt—36 to 51 cm (14 to 20 inches); brown (10YR 5/3) silty clay; moderate medium prismatic structure parting to weak medium angular blocky; very firm; many faint light gray (10YR 7/2) (dry) silt coatings and many distinct grayish brown (10YR 5/2) clay films on faces of peds; common fine and medium irregular manganese coatings; common fine and medium spherical iron-manganese nodules throughout; common medium prominent strong brown (7.5YR 5/6) masses of oxidized iron in the matrix; slightly acid; clear smooth boundary.

Btn—51 to 64 cm (20 to 25 inches); pale brown (10YR 6/3) silty clay loam; moderate medium prismatic structure parting to weak medium angular blocky; very firm; common faint light gray (10YR 7/2) (dry) silt coatings and many distinct grayish brown (10YR 5/2) clay films on faces of peds; common fine and medium irregular manganese coatings; common fine and medium spherical iron-manganese nodules throughout; many medium faint light brownish gray (10YR 6/2) iron depletions and common medium prominent strong brown (7.5YR 5/6) masses of oxidized iron in the matrix; slightly alkaline; clear smooth boundary.

Btng1—64 to 79 cm (25 to 31 inches); light brownish gray (10YR 6/2) silty clay loam; weak medium prismatic structure parting to weak medium angular blocky; firm; common faint grayish brown (10YR 5/2) clay films on faces of peds; common fine and medium irregular manganese coatings and iron-manganese nodules throughout; many coarse faint pale brown (10YR 6/3) and common medium prominent strong brown (7.5YR 4/6) masses of oxidized iron-manganese in the matrix; moderately alkaline; clear smooth boundary.

Btng2—79 to 102 cm (31 to 40 inches); light brownish gray (10YR 6/2) silt loam; weak medium subangular blocky structure; firm; few faint grayish brown (10YR 5/2) clay films on faces of peds; many fine and medium irregular manganese coatings and iron-manganese nodules throughout; many medium prominent strong brown (7.5YR 5/8) masses of oxidized iron in the matrix; slightly effervescent; strongly alkaline; clear smooth boundary.

2BCtng—102 to 124 cm (40 to 49 inches); light brownish gray (10YR 6/2) silt loam; weak medium subangular blocky structure; friable; few faint light gray (10YR 7/2) (dry) silt coatings and grayish brown (10YR 5/2) clay films on faces of peds; common fine and medium irregular manganese coatings and iron-manganese nodules throughout; common fine prominent strong brown (7.5YR 5/6) masses of oxidized iron in the matrix; strongly effervescent; strongly alkaline; gradual smooth boundary.

2Cng—124 to 152 cm (49 to 60 inches); light brownish gray (2.5Y 6/2) silt loam; massive; friable; common faint light gray (10YR 7/2) (dry) silt coatings on surfaces along pores; many fine and medium irregular manganese coatings and iron-manganese nodules throughout; common fine and medium distinct dark yellowish brown (10YR 4/4) masses of oxidized iron-manganese in the matrix; strongly alkaline.

Range in Characteristics

Thickness of the loess: More than 50 cm (20 inches)
Carbonates: Commonly in the natric horizon
Depth to the base of the natric horizon: 75 to 150 cm (30 to 60 inches)

Ap horizon:
Hue—10YR
Value—3 to 5
Chroma—2 or 3
Texture—silt loam
Content of rock fragments—none
Reaction—very strongly acid to neutral

E horizon:
Hue—10YR
Value—5 or 6
Chroma—2
Texture—silt loam
Content of rock fragments—none
Reaction—strongly acid to neutral

Bt, Btn, or Btng horizon:
Hue—10YR or 2.5Y
Value—4 to 7

Chroma—2 to 6
Texture—silty clay, silty clay loam, or silt loam
Content of rock fragments—none
Reaction—very strongly acid to slightly alkaline in the upper part; neutral to strongly alkaline in the lower part

2Btng, 2BCng, or 2Cng horizon:
Hue—10YR or 2.5Y
Value—5 to 7
Chroma—1 or 2
Texture—silt loam, clay loam, or silty clay loam
Content of rock fragments—0 to 5 percent
Reaction—slightly alkaline to strongly alkaline

912A—Hoyleton-Darmstadt silt loams, 0 to 2 percent slopes

Setting

Landform: Till plains
Position on the landform: Summits

Map Unit Composition

Hoyleton and similar soils: 50 percent
Darmstadt and similar soils: 40 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

Similar soils:
- Soils that have sodium deeper in the profile
- Soils that have a deeper water table

Dissimilar soils:
- The poorly drained Cisne and Huey soils on flats and in depressions; in landscape positions below those of the Hoyleton and Darmstadt soils

Properties and Qualities of the Hoyleton Soil

Parent material: Loess over mixed loess and drift
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Sodium adsorption ratio within a depth of 30 inches: 0 to 5
Available water capacity: About 9.6 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.5 to 3.5 percent
Shrink-swell potential: High
Apparent seasonal high water table (depth, months): 1 to 2 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and concrete
Surface runoff class: Low
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Properties and Qualities of the Darmstadt Soil

Parent material: Loess over mixed loess and drift
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow or slow
Depth to restrictive feature: 10 to 20 inches to a natric horizon
Sodium adsorption ratio within a depth of 30 inches: 13 to 25
Available water capacity: About 10.2 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.0 to 2.5 percent
Shrink-swell potential: Moderate
Apparent seasonal high water table (depth, months): 1 to 2 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Hoyleton—2w; Darmstadt—3s
Prime farmland category: Not prime farmland
Hydric soil status: Hoyleton—not hydric; Darmstadt—not hydric

912B—Hoyleton-Darmstadt silt loams, 2 to 5 percent slopes

Setting

Landform: Till plains
Position on the landform: Summits, shoulders, and backslopes

Map Unit Composition

Hoyleton and similar soils: 50 percent
Darmstadt and similar soils: 40 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

Similar soils:
- Soils that have more sand in the subsoil
- Soils that have sodium deeper in the profile
- Soils that have a deeper water table

Dissimilar soils:
- The moderately well drained Tamalco soils on slight rises; in landscape positions above those of the Hoyleton and Darmstadt soils
- The poorly drained Cisne and Huey soils on flats and in depressions; in landscape positions below those of the Hoyleton and Darmstadt soils

Properties and Qualities of the Hoyleton Soil

Parent material: Loess over mixed loess and drift
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow

Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Sodium adsorption ratio within a depth of 30 inches: 0 to 5
Available water capacity: About 9.9 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.5 to 3.5 percent
Shrink-swell potential: High
Apparent seasonal high water table (depth, months): 1 to 2 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and concrete
Surface runoff class: Low
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Properties and Qualities of the Darmstadt Soil

Parent material: Loess over mixed loess and drift
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow or slow
Depth to restrictive feature: 10 to 20 inches to a natric horizon
Sodium adsorption ratio within a depth of 30 inches: 13 to 25
Available water capacity: About 9.2 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.0 to 2.5 percent
Shrink-swell potential: Moderate
Apparent seasonal high water table (depth, months): 1 to 2 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Hoyleton—2e; Darmstadt—3s
Prime farmland category: Not prime farmland
Hydric soil status: Hoyleton—not hydric; Darmstadt—not hydric

912B2—Hoyleton-Darmstadt silt loams, 2 to 5 percent slopes, eroded

Setting

Landform: Till plains
Position on the landform: Summits, shoulders, and backslopes

Map Unit Composition

Hoyleton and similar soils: 50 percent
Darmstadt and similar soils: 40 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

Similar soils:
- Soils that have more sand in the subsoil
- Soils that have sodium deeper in the profile

Dissimilar soils:
- The poorly drained Cisne and Huey soils on flats; in landscape positions above those of the Hoyleton and Darmstadt soils

Properties and Qualities of the Hoyleton Soil

Parent material: Loess over mixed loess and drift
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Sodium adsorption ratio within a depth of 30 inches: 0 to 5
Available water capacity: About 9.5 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.0 to 2.5 percent
Shrink-swell potential: High
Apparent seasonal high water table (depth, months): 1 to 2 feet, January through May
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: High
Hazard of corrosion: High for steel and concrete
Surface runoff class: Low
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Properties and Qualities of the Darmstadt Soil

Parent material: Loess over mixed loess and drift
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow or slow
Depth to restrictive feature: 6 to 20 inches to a natric horizon
Sodium adsorption ratio within a depth of 30 inches: 13 to 25
Available water capacity: About 8.7 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.0 to 2.5 percent
Shrink-swell potential: Moderate
Apparent seasonal high water table (depth, months): 1 to 2 feet, January through May
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: High
Hazard of corrosion: High for steel and concrete
Surface runoff class: High
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Hoyleton—2e; Darmstadt—3s
Prime farmland category: Not prime farmland
Hydric soil status: Hoyleton—not hydric; Darmstadt—not hydric

Gosport Series

Taxonomic classification: Fine, illitic, mesic Oxyaquic Dystrudepts

Typical Pedon

Gosport silt loam, in an area of Hickory-Gosport silt loams, 18 to 35 percent slopes, on a slope of 22 percent at an elevation of 545 feet above mean sea level; Jasper County, Illinois; about 135 feet north and 1,650 feet west of the southeast corner of sec. 31, T. 8 N., R. 9 E.; USGS Wheeler, Illinois, topographic quadrangle; lat. 39 degrees 05 minutes 0.8 second N. and long. 88 degrees 15 minutes 06.5 seconds W.; UTM Zone 16S, 0391729 Easting, 4326794 Northing; NAD 83:

A—0 to 10 cm (0 to 4 inches); very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; many very fine and fine roots; few pebbles and shale fragments; slightly acid; clear smooth boundary.

E—10 to 18 cm (4 to 7 inches); yellowish brown (10YR 5/4) silt loam; weak fine subangular blocky structure; friable; many very fine and common fine roots; few pebbles and shale fragments; extremely acid; clear smooth boundary.

Bt—18 to 33 cm (7 to 13 inches); yellowish brown (10YR 5/4) silty clay loam; moderate fine subangular blocky structure; firm; common very fine roots; few faint pale brown (10YR 6/3) clay films on faces of peds; few shale fragments and till pebbles; very strongly acid; gradual smooth boundary.

Bw1—33 to 64 cm (13 to 25 inches); yellowish brown (10YR 5/4) silty clay; moderate medium subangular blocky structure; firm; common very fine and few fine and medium roots; common fine distinct yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; common shale fragments; extremely acid; gradual smooth boundary.

Bw2—64 to 81 cm (25 to 32 inches); yellowish brown (10YR 5/4) silty clay; weak coarse subangular blocky structure; some medium platy rock structure; firm; common very fine and few fine and medium roots; few fine faint brown (10YR 5/3) iron depletions and common medium distinct yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; common shale fragments; extremely acid; gradual smooth boundary.

Cr—81 to 152 cm (32 to 60 inches); grayish brown (10YR 5/2), gray (N 5/), and very dark gray (N 3/) extremely paraflaggy silty clay; medium to very thick platy rock structure; extremely firm; few fine and medium roots in bedding planes; strongly acid.

Range in Characteristics

Thickness of the loess: Less than 50 cm (20 inches)
Depth to the base of the cambic horizon: 50 to 90 cm (20 to 35 inches)
Depth to shale bedrock: 50 to 90 cm (20 to 35 inches)

A horizon:
Hue—10YR
Value—3 or 4
Chroma—1 or 2
Texture—silt loam
Content of rock fragments—1 to 15 percent
Reaction—slightly acid or neutral

E horizon (where present):
Hue—10YR
Value—4 or 5
Chroma—2 to 4

Texture—silt loam
Content of rock fragments—1 to 15 percent
Reaction—extremely acid to strongly acid

Bw horizon:
Hue—10YR or 2.5Y
Value—5 or 6
Chroma—3 or 4
Texture—silty clay or silty clay loam
Content of rock fragments—2 to 15 percent
Reaction—extremely acid to strongly acid

Cr horizon:
Hue—7.5YR to 5Y or N
Value—3 to 6
Chroma—0 to 6
Texture—extremely paraflaggy silty clay
Content of rock fragments—65 to 98 percent
Reaction—very strongly acid to slightly acid

551D2—Gosport silt loam, 10 to 18 percent slopes, eroded

Setting

Landform: Hillslopes on rock pediments
Position on the landform: Backslopes

Map Unit Composition

Gosport and similar soils: 90 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

Similar soils:
- Soils that are deeper to bedrock
- Soils that have less clay in the subsoil

Dissimilar soils:
- The somewhat poorly drained Atlas and Passport soils on the gentler slopes; in landscape positions above those of the Gosport soil
- The somewhat poorly drained Bluford soils on ridges; in landscape positions above those of the Gosport soil

Properties and Qualities of the Gosport Soil

Parent material: Shale residuum
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Available water capacity: About 6.1 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.0 to 2.5 percent
Shrink-swell potential: High
Apparent seasonal high water table (depth, months): 1.5 to 4.0 feet, February through April
Ponding: None
Flooding: None

Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Hazard of corrosion: High for steel and concrete
Surface runoff class: High
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 4e
Prime farmland category: Not prime farmland
Hydric soil status: Not hydric

551F—Gosport silt loam, 18 to 35 percent slopes

Setting

Landform: Hillslopes on rock pediments
Position on the landform: Backslopes

Map Unit Composition

Gosport and similar soils: 90 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

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

Dissimilar soils:
- The well drained Hickory soils in landscape positions above those of the Gosport soil

Properties and Qualities of the Gosport Soil

Parent material: Shale residuum
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Available water capacity: About 6.1 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.0 to 2.5 percent
Shrink-swell potential: High
Apparent seasonal high water table (depth, months): 1.5 to 4.0 feet, February through April
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: High for steel and concrete
Surface runoff class: Very high
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 6e
Prime farmland category: Not prime farmland
Hydric soil status: Not hydric

551G—Gosport silt loam, 35 to 60 percent slopes

Setting

Landform: Hillslopes on rock pediments
Position on the landform: Backslopes

Map Unit Composition

Gosport and similar soils: 90 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

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

Dissimilar soils:
- The well drained Hickory soils in landscape positions above those of the Gosport soil

Properties and Qualities of the Gosport Soil

Parent material: Shale residuum
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Available water capacity: About 6.1 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.0 to 2.5 percent
Shrink-swell potential: High
Apparent seasonal high water table (depth, months): 1.5 to 4.0 feet, February through April
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: High for steel and concrete
Surface runoff class: Very high
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 7e
Prime farmland category: Not prime farmland
Hydric soil status: Not hydric

967F—Hickory-Gosport silt loams, 18 to 35 percent slopes

Setting

Landform: Hillslopes
Position on the landform: Backslopes

Map Unit Composition

Hickory and similar soils: 50 percent
Gosport and similar soils: 35 percent
Dissimilar soils: 15 percent

Soils of Minor Extent

Similar soils:
- Soils that have steeper slopes
- Soils that have bedrock closer to the surface

Dissimilar soils:
- The moderately well drained Ava soils on the crest of slopes; in landscape positions above those of the Hickory soil

Properties and Qualities of the Hickory Soil

Parent material: Till
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 8.2 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: Moderate for steel and high for concrete
Surface runoff class: High
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Properties and Qualities of the Gosport Soil

Parent material: Shale residuum
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Available water capacity: About 6.1 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.0 to 2.5 percent
Shrink-swell potential: High
Apparent seasonal high water table (depth, months): 1.5 to 4.0 feet, February through April
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: High for steel and concrete
Surface runoff class: Very high
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Hickory—6e; Gosport—6e
Prime farmland category: Not prime farmland
Hydric soil status: Hickory—not hydric; Gosport—not hydric

Grantfork Series

Taxonomic classification: Fine-loamy, mixed, superactive, mesic Aeric Epiaqualfs
Taxadjunct features: The Grantfork soils in map units 888C2 and 914C2 are slightly

better drained than is defined as the range for the series. Also, the Grantfork soil in map unit 914C2 contains more clay in the particle-size control section. These differences, however, do not significantly affect the use and management of the soils. The Grantfork soil in map unit 888C2 is classified as a fine-loamy, mixed, active, mesic Aquic Hapludalf. The Grantfork soil in map unit 914C2 is classified as a fine, smectitic, mesic Albaquic Hapludalf.

Typical Pedon

Grantfork silt loam, in an area of Passport-Grantfork silt loams, 5 to 10 percent slopes, eroded, on a slope of 11 percent at an elevation of 580 feet above mean sea level; Marion County, Illinois; about 1,360 feet south and 205 feet west of the center of sec. 23, T. 3 N., R. 2 E.; USGS Salem North, Illinois, topographic quadrangle; lat. 38 degrees 40 minutes 55.3 seconds N. and long. 88 degrees 57 minutes 01.2 seconds W.; UTM Zone 16S, 0330357 Easting, 4283296 Northing; NAD 83:

Ap—0 to 10 cm (0 to 4 inches); dark brown (10YR 3/3) silt loam, pale brown (10YR 6/3) dry; mixed with few fine pockets of brown (10YR 5/3) subsurface material; weak very fine granular structure; friable; common very fine and fine roots; few fine spherical iron-manganese nodules throughout; about 1 percent fine and medium gravel; very strongly acid; abrupt smooth boundary.

E—10 to 23 cm (4 to 9 inches); brown (10YR 5/3) silt loam; weak medium and thin platy and weak medium subangular blocky structure; friable; common very fine and fine roots; common fine and medium spherical iron-manganese nodules throughout; common fine faint light brownish gray (10YR 6/2) iron depletions in the matrix; about 1 percent fine and medium gravel; strongly acid; clear smooth boundary.

Bt—23 to 41 cm (9 to 16 inches); brown (10YR 5/3) loam; moderate fine and medium prismatic structure parting to moderate medium angular blocky; firm; common very fine and fine roots; common distinct dark gray (10YR 4/1) clay films on faces of peds; common fine and medium irregular manganese coatings and iron-manganese nodules throughout; common fine distinct yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; few fine faint light brownish gray (10YR 6/2) iron depletions in the matrix; about 1 percent fine and medium gravel; moderately acid; clear wavy boundary.

Btng1—41 to 76 cm (16 to 30 inches); light brownish gray (10YR 6/2) silt loam; moderate medium prismatic structure parting to moderate coarse angular blocky; firm; common very fine and fine roots; common distinct dark gray (10YR 4/1) clay films on faces of peds; common fine and medium irregular manganese coatings and iron-manganese nodules throughout; common medium prominent yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; about 3 percent fine and medium gravel; moderately alkaline; clear smooth boundary.

2Btng2—76 to 107 cm (30 to 42 inches); light brownish gray (10YR 6/2) loam; moderate medium prismatic structure parting to moderate coarse angular blocky; firm; common very fine and fine roots; many prominent dark gray (10YR 4/1) clay films on faces of peds; common medium irregular manganese coatings and iron-manganese nodules throughout; common medium prominent yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; about 5 percent fine, medium, and coarse gravel; strongly alkaline; clear wavy boundary.

2Btng3—107 to 135 cm (42 to 53 inches); gray (10YR 6/1) loam; moderate medium prismatic structure parting to weak coarse angular blocky; firm; few very fine roots; common distinct dark gray (10YR 4/1) and gray (10YR 5/1) clay films on faces of peds; common medium irregular manganese coatings and iron-manganese nodules throughout; many medium and coarse prominent strong brown (7.5YR 5/6) masses of oxidized iron in the matrix; about 5 percent fine, medium, and coarse gravel; strongly alkaline; gradual wavy boundary.

2BCtng—135 to 152 cm (53 to 60 inches); gray (10YR 6/1) loam; weak medium prismatic structure; friable; few distinct gray (10YR 5/1) and dark gray (10YR 4/1) clay films on faces of peds; common medium irregular manganese coatings and iron-manganese nodules throughout; many medium and coarse prominent strong brown (7.5YR 5/6) masses of oxidized iron in the matrix; about 5 percent fine, medium, and coarse gravel; strongly alkaline.

Range in Characteristics

Depth to carbonates: More than 115 cm (45 inches)
Depth to the base of the argillic horizon: 115 to 200 cm (45 to 80 inches)

Ap or A horizon:
Hue—10YR
Value—3 or 4
Chroma—2 to 4
Texture—silt loam
Content of rock fragments—0 to 1 percent
Reaction—very strongly acid to neutral

E, EB, or BE horizon:
Hue—10YR
Value—4 or 5
Chroma—2 to 4
Texture—silt loam
Content of rock fragments—0 to 1 percent
Reaction—strongly acid to neutral

Bt, Btg, Btng, 2Bt, 2Btg, or 2Btng horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 7
Chroma—1 to 4
Texture—silt loam, loam, clay loam, or silty clay loam
Content of rock fragments—0 to 5 percent
Reaction—moderately acid to strongly alkaline

2BCtng, 2BC, or 2C horizon:
Hue—10YR or 2.5Y
Value—5 or 6
Chroma—1 or 2
Texture—silt loam, loam, clay loam, or silty clay loam
Content of rock fragments—0 to 5 percent
Reaction—slightly alkaline to strongly alkaline

888C2—Passport-Grantfork silt loams, 5 to 10 percent slopes, eroded

Setting

Landform: Till plains
Position on the landform: Shoulders and backslopes

Map Unit Composition

Passport and similar soils: 50 percent
Grantfork and similar soils: 35 percent
Dissimilar soils: 15 percent

Soils of Minor Extent

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

Dissimilar soils:
- The poorly drained Cisne soils on flats; in landscape positions above those of the Passport soil

Properties and Qualities of the Passport Soil

Parent material: Mixed loess and drift over a paleosol that formed in till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: More than 80 inches
Sodium adsorption ratio within a depth of 30 inches: 0 to 3
Available water capacity: About 7.8 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.0 to 2.5 percent
Shrink-swell potential: Moderate
Apparent seasonal high water table (depth, months): 1 to 2 feet, January through May
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Hazard of corrosion: High for steel and concrete
Surface runoff class: Medium
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Properties and Qualities of the Grantfork Soil

Parent material: Mixed loess and drift over a paleosol that formed in till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: More than 80 inches
Sodium adsorption ratio within a depth of 30 inches: 5 to 13
Available water capacity: About 8.1 inches to a depth of 60 inches
Content of organic matter in the surface layer: 0.5 to 2.0 percent
Shrink-swell potential: Moderate
Apparent seasonal high water table (depth, months): 1 to 2 feet, January through May
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Medium
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Passport—3e; Grantfork—3e
Prime farmland category: Not prime farmland
Hydric soil status: Passport—not hydric; Grantfork—not hydric

914C2—Atlas-Grantfork silt loams, 5 to 10 percent slopes, eroded

Setting

Landform: Till plains
Position on the landform: Shoulders and backslopes

Map Unit Composition

Atlas and similar soils: 50 percent
Grantfork and similar soils: 40 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

Similar soils:
- Soils that have less clay in the subsoil
- Soils that have more sodium in the subsoil
- Soils that have a darker surface layer

Dissimilar soils:
- The poorly drained Cisne soils on flats; in landscape positions above those of the Atlas soil

Properties and Qualities of the Atlas Soil

Parent material: Loess over a paleosol or paleo accretionary deposits
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow or moderately slow
Depth to restrictive feature: More than 80 inches
Sodium adsorption ratio within a depth of 30 inches: 0 to 3
Available water capacity: About 7.8 inches to a depth of 60 inches
Content of organic matter in the surface layer: 0.5 to 2.0 percent
Shrink-swell potential: High
Apparent seasonal high water table (depth, months): 1 to 2 feet, January through May
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: High
Hazard of corrosion: High for steel and concrete
Surface runoff class: Very high
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Properties and Qualities of the Grantfork Soil

Parent material: Paleosol or paleo accretionary deposits
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 5 to 10 inches to abrupt textural change
Sodium adsorption ratio within a depth of 30 inches: 5 to 13
Available water capacity: About 7.9 inches to a depth of 60 inches
Content of organic matter in the surface layer: 0.5 to 2.0 percent
Shrink-swell potential: High

Apparent seasonal high water table (depth, months): 1 to 2 feet, January through May
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Hazard of corrosion: High for steel and concrete
Surface runoff class: High
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Atlas—3e; Grantfork—3e
Prime farmland category: Not prime farmland
Hydric soil status: Atlas—not hydric; Grantfork—not hydric

Hickory Series

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

Typical Pedon

Hickory silt loam, 18 to 35 percent slopes, on a slope of 30 percent at an elevation of 590 feet above mean sea level; Bond County, Illinois; about 38 feet north and 792 feet west of the southeast corner of sec. 28, T. 7 N., R. 3 W.; USGS Coffeen, Illinois, topographic quadrangle; lat. 39 degrees 00 minutes 48.3 seconds N. and long. 89 degrees 25 minutes 13.1 seconds W.; UTM Zone 16S, 0290448 Easting, 4321051 Northing; NAD 83:

A—0 to 10 cm (0 to 4 inches); dark grayish brown (10YR 4/2) silt loam, pale brown (10YR 6/3) dry; weak fine granular structure; friable; many very fine and few fine and medium roots; few fine and medium continuous tubular pores; about 20 percent sand; very strongly acid; clear smooth boundary.

E—10 to 30 cm (4 to 12 inches); light yellowish brown (10YR 6/4) silt loam, very pale brown (10YR 7/4) dry; weak very thick platy structure parting to weak fine granular; friable; few very fine to medium roots; few fine and medium continuous tubular pores; pockets of dark grayish brown (10YR 4/2) surface soil filling large root channels; 20 percent sand and 1 percent gravel; strongly acid; clear smooth boundary.

Bt1—30 to 43 cm (12 to 17 inches); yellowish brown (10YR 5/6) clay loam; moderate fine subangular blocky structure; firm; common very fine and few fine and medium roots; common distinct brown (10YR 4/3) clay films on faces of peds; 1 percent gravel; very strongly acid; clear smooth boundary.

Bt2—43 to 66 cm (17 to 26 inches); dark yellowish brown (10YR 4/6) clay loam; moderate medium subangular blocky structure; firm; few very fine and medium roots; common distinct brown (10YR 5/3) clay films on faces of peds; 2 percent fine and medium gravel; very strongly acid; gradual smooth boundary.

Bt3—66 to 89 cm (26 to 35 inches); yellowish brown (10YR 5/4) clay loam; moderate medium and coarse angular blocky structure; firm; few very fine and medium roots; many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds and few prominent brown (7.5YR 4/4) clay films coating medium pebbles; many medium and coarse prominent brownish yellow (10YR 6/8) and strong brown (7.5YR 5/8) masses of oxidized iron in the matrix; few fine spherical black (10YR 2/1) iron-manganese nodules with sharp boundaries; about 3 percent fine and medium gravel; very strongly acid; gradual smooth boundary.

Bt4—89 to 117 cm (35 to 46 inches); yellowish brown (10YR 5/4) clay loam; weak medium and coarse prismatic structure parting to weak coarse angular blocky; firm; few very fine and medium roots; common distinct dark yellowish brown (10YR 4/4) clay films on vertical faces of peds and few prominent brown (7.5YR 4/4) clay films coating medium and coarse pebbles; many coarse distinct strong brown (7.5YR 5/6) masses of oxidized iron in the matrix; few fine spherical black (10YR 2/1) iron-manganese nodules with sharp boundaries; 4 percent fine to coarse gravel; strongly acid; diffuse smooth boundary.

BCt—117 to 147 cm (46 to 58 inches); light yellowish brown (10YR 6/4) loam; weak medium and coarse subangular blocky structure; friable; few very fine and fine roots; few distinct dark yellowish brown (10YR 4/4) clay films on vertical faces of peds and few prominent brown (7.5YR 4/4) clay films coating medium pebbles; common medium distinct dark yellowish brown (10YR 4/6) and few fine distinct strong brown (7.5YR 5/6) masses of oxidized iron in the matrix; few fine spherical black (10YR 2/1) iron-manganese nodules with sharp boundaries; 5 percent fine and medium gravel; strongly acid; gradual smooth boundary.

CBt—147 to 165 cm (58 to 65 inches); yellowish brown (10YR 5/6) loam; massive; friable; few very fine and fine roots; few distinct brown (10YR 4/3) clay films lining root channels and coating medium pebbles; few fine distinct brown (10YR 5/3) iron depletions in the matrix; 5 percent fine and medium gravel; moderately acid; clear smooth boundary.

C—165 to 203 cm (65 to 80 inches); yellowish brown (10YR 5/4), strong brown (7.5YR 5/6), and light gray (10YR 7/1) loam; massive; friable; few very fine roots; 3 percent fine and medium gravel; slightly acid.

Range in Characteristics

Thickness of the loess: Less than 51 cm (20 inches)
Depth to carbonates: More than 102 cm (40 inches)
Depth to the base of the argillic horizon: More than 102 cm (40 inches)

Ap or A horizon:
Hue—7.5YR or 10YR
Value—2 to 5
Chroma—2 to 6
Texture—silt loam
Content of rock fragments—0 to 5 percent
Reaction—very strongly acid to neutral

E horizon:
Hue—10YR
Value—4 to 6
Chroma—2 to 4
Texture—silt loam or loam
Content of rock fragments—0 to 5 percent
Reaction—very strongly acid to neutral

Bt horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—3 to 6
Texture—clay loam, loam, silty clay loam, or gravelly clay loam
Content of rock fragments—0 to 20 percent
Reaction—very strongly acid to neutral

BCt or BC horizon (where present):
Hue—7.5YR, 10YR, or 2.5Y

Value—4 to 6
Chroma—3 to 6
Texture—clay loam, loam, gravelly clay loam, or sandy loam
Content of rock fragments—0 to 20 percent
Reaction—strongly acid to slightly alkaline

C and CBt horizons:
Hue—7.5YR, 10YR, or 2.5Y
Value—5 to 7
Chroma—1 to 8
Texture—loam, clay loam, or sandy loam or the gravelly analogs of these textures
Content of rock fragments—2 to 20 percent
Reaction—slightly acid to moderately alkaline

8D3—Hickory clay loam, 10 to 18 percent slopes, severely eroded

Setting

Landform: Hillslopes on till plains
Position on the landform: Shoulders and backslopes

Map Unit Composition

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

Soils of Minor Extent

Similar soils:
- Moderately well drained soils on the gentler slopes; in landscape positions above those of the Hickory soil

Dissimilar soils:
- The somewhat poorly drained Atlas soils near the head of drainageways
- The moderately well drained Ava soils along the crest of slopes; in landscape positions above those of the Hickory soil
- Soils that are subject to flooding

Properties and Qualities of the Hickory Soil

Parent material: Loamy till
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate
Depth to restrictive feature: More than 80 inches
Available water capacity: About 9.9 inches to a depth of 60 inches
Content of organic matter in the surface layer: 0.5 to 1.0 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Accelerated erosion: The surface layer is mostly subsoil material.
Potential for frost action: Moderate
Hazard of corrosion: Moderate for steel and concrete
Surface runoff class: Medium
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 4e
Prime farmland category: Not prime farmland
Hydric soil status: Not hydric

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

Setting

Landform: Hillslopes on till plains
Position on the landform: Backslopes

Map Unit Composition

Hickory and similar soils: 91 percent
Dissimilar soils: 9 percent

Soils of Minor Extent

Similar soils:
- Soils that are moderately deep to bedrock
- Soils that are more eroded
- Soils that are in steeper areas

Dissimilar soils:
- The somewhat poorly drained Atlas and Passport soils on the gentler slopes; in landscape positions above those of the Hickory soil
- The moderately well drained Ava soils along the crest of slopes; in landscape positions above those of the Hickory soil
- Soils that are subject to flooding

Properties and Qualities of the Hickory Soil

Parent material: Till
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 8.4 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: Moderate for steel and high for concrete
Surface runoff class: High
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 6e
Prime farmland category: Not prime farmland
Hydric soil status: Not hydric

8G—Hickory loam, 35 to 60 percent slopes

Setting

Landform: Hillslopes on till plains
Position on the landform: Backslopes

Map Unit Composition

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

Components of Minor Extent

Similar soils:
- Soils that are moderately deep to bedrock
- Soils that are more eroded

Dissimilar components:
- The moderately well drained Ava soils along the crest of slopes; in landscape positions above those of the Hickory soil
- Rock outcrops at the base of slopes
- Soils that are subject to flooding

Properties and Qualities of the Hickory Soil

Parent material: Till
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 7.4 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: Moderate for steel and high for concrete
Surface runoff class: High
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 7e
Prime farmland category: Not prime farmland
Hydric soil status: Not hydric

908D2—Hickory-Kell silt loams, 10 to 18 percent slopes, eroded

Setting

Landform: Hillslopes
Position on the landform: Backslopes

Map Unit Composition

Hickory and similar soils: 60 percent

Kell and similar soils: 30 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

Similar soils:
- Soils that have more clay in the subsoil
- Soils that have bedrock closer to the surface

Dissimilar soils:
- The somewhat poorly drained Bluford and moderately well drained Ava soils along the crest of slopes; in landscape positions above those of the Hickory soil

Properties and Qualities of the Hickory Soil

Parent material: Till
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 7.5 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.0 to 2.5 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Hazard of corrosion: Moderate for steel and high for concrete
Surface runoff class: Medium
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Properties and Qualities of the Kell Soil

Parent material: Loamy diamicton over residuum derived from sandstone and shale
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow to moderately slow
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Available water capacity: About 5 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.0 to 2.5 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Hazard of corrosion: Moderate for steel and high for concrete
Surface runoff class: High
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Hickory—4e; Kell—4e
Prime farmland category: Not prime farmland
Hydric soil status: Hickory—not hydric; Kell—not hydric

908F—Hickory-Kell silt loams, 18 to 35 percent slopes

Setting

Landform: Hillslopes
Position on the landform: Backslopes

Map Unit Composition

Hickory and similar soils: 55 percent
Kell and similar soils: 35 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

Similar soils:
- Soils that have more clay in the subsoil
- Soils that have bedrock closer to the surface

Dissimilar soils:
- The somewhat poorly drained Bluford and moderately well drained Ava soils along the crest of slopes; in landscape positions above those of the Hickory soil
- Soils that are subject to flooding

Properties and Qualities of the Hickory Soil

Parent material: Till
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 7.9 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: Moderate for steel and high for concrete
Surface runoff class: High
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Properties and Qualities of the Kell Soil

Parent material: Loamy diamicton over residuum derived from sandstone and shale
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow to moderately slow
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Available water capacity: About 5.3 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.0 to 2.5 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: Moderate for steel and high for concrete
Surface runoff class: High
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Hickory—6e; Kell—6e
Prime farmland category: Not prime farmland
Hydric soil status: Hickory—not hydric; Kell—not hydric

929D2—Ava-Hickory silt loams, 10 to 18 percent slopes, eroded

Setting

Landform: Hillslopes on till plains
Position on the landform: Shoulders and backslopes

Map Unit Composition

Ava and similar soils: 55 percent
Hickory and similar soils: 40 percent
Dissimilar soils: 5 percent

Soils of Minor Extent

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

Dissimilar soils:
- The somewhat poorly drained Bluford soils in landscape positions above those of the Ava soil
- Soils that are subject to flooding

Properties and Qualities of the Ava Soil

Parent material: Loess over mixed loess and drift
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow
Depth to restrictive feature: 25 to 40 inches to a fragipan
Available water capacity: About 6 inches to a depth of 60 inches
Content of organic matter in the surface layer: 0.5 to 2.0 percent
Shrink-swell potential: Moderate
Perched seasonal high water table (depth, months): 1.5 to 2.9 feet, February through April
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: High
Hazard of corrosion: High for steel and concrete
Surface runoff class: High
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Properties and Qualities of the Hickory Soil

Parent material: Loamy till
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches

Available water capacity: About 7.3 inches to a depth of 60 inches
Content of organic matter in the surface layer: 0.5 to 2.0 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Hazard of corrosion: Moderate for steel and high for concrete
Surface runoff class: Medium
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Ava—4e; Hickory—4e
Prime farmland category: Not prime farmland
Hydric soil status: Ava—not hydric; Hickory—not hydric

947D2—Hickory-Passport silt loams, 10 to 18 percent slopes, eroded

Setting

Landform: Hillslopes on till plains
Position on the landform: Backslopes

Map Unit Composition

Hickory and similar soils: 45 percent
Passport and similar soils: 40 percent
Dissimilar soils: 15 percent

Soils of Minor Extent

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

Dissimilar soils:
- The moderately well drained Ava soils on the crest of slopes; in landscape positions above those of the Passport soil
- Soils that are subject to flooding

Properties and Qualities of the Hickory Soil

Parent material: Loamy till
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 7.3 inches to a depth of 60 inches
Content of organic matter in the surface layer: 0.5 to 2.0 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Hazard of corrosion: Moderate for steel and high for concrete
Surface runoff class: Medium
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Properties and Qualities of the Passport Soil

Parent material: Mixed loess and drift over a paleosol that formed in till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 7.8 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.0 to 2.5 percent
Shrink-swell potential: Moderate
Apparent seasonal high water table (depth, months): 1 to 2 feet, January through May
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Hazard of corrosion: High for steel and concrete
Surface runoff class: Medium
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Hickory—4e; Passport—4e
Prime farmland category: Not prime farmland
Hydric soil status: Hickory—not hydric; Passport—not hydric

947D3—Hickory-Passport clay loams, 10 to 18 percent slopes, severely eroded

Setting

Landform: Hillslopes on till plains
Position on the landform: Backslopes

Map Unit Composition

Hickory and similar soils: 45 percent
Passport and similar soils: 40 percent
Dissimilar soils: 15 percent

Soils of Minor Extent

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

Dissimilar soils:
- The moderately well drained Ava soils on the crest of slopes; in landscape positions above those of the Passport soil
- Soils that are subject to flooding

Properties and Qualities of the Hickory Soil

Parent material: Till
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 6.9 inches to a depth of 60 inches

Content of organic matter in the surface layer: 0.3 to 1.0 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Accelerated erosion: The surface layer is mostly subsoil material.
Potential for frost action: Moderate
Hazard of corrosion: Moderate for steel and high for concrete
Surface runoff class: Medium
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Properties and Qualities of the Passport Soil

Parent material: Mixed loess and drift over a paleosol that formed in till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 7.5 inches to a depth of 60 inches
Content of organic matter in the surface layer: 0.3 to 1.0 percent
Shrink-swell potential: Moderate
Apparent seasonal high water table (depth, months): 1 to 2 feet, January through May
Ponding: None
Flooding: None
Accelerated erosion: The surface layer is mostly subsoil material.
Potential for frost action: Moderate
Hazard of corrosion: High for steel and concrete
Surface runoff class: Medium
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Hickory—4e; Passport—4e
Prime farmland category: Not prime farmland
Hydric soil status: Hickory—not hydric; Passport—not hydric

967F—Hickory-Gosport silt loams, 18 to 35 percent slopes

Setting

Landform: Hillslopes
Position on the landform: Backslopes

Map Unit Composition

Hickory and similar soils: 50 percent
Gosport and similar soils: 35 percent
Dissimilar soils: 15 percent

Soils of Minor Extent

Similar soils:
- Soils that have steeper slopes
- Soils that have bedrock closer to the surface

Dissimilar soils:

- The moderately well drained Ava soils on the crest of slopes; in landscape positions above those of the Hickory soil

Properties and Qualities of the Hickory Soil

Parent material: Till
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 8.2 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: Moderate for steel and high for concrete
Surface runoff class: High
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Properties and Qualities of the Gosport Soil

Parent material: Shale residuum
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Available water capacity: About 6.1 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.0 to 2.5 percent
Shrink-swell potential: High
Apparent seasonal high water table (depth, months): 1.5 to 4.0 feet, February through April
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: High for steel and concrete
Surface runoff class: Very high
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Hickory—6e; Gosport—6e
Prime farmland category: Not prime farmland
Hydric soil status: Hickory—not hydric; Gosport—not hydric

Holton Series

Taxonomic classification: Coarse-loamy, mixed, active, nonacid, mesic Aeric Endoaquepts

Typical Pedon

Holton silt loam, 0 to 2 percent slopes, frequently flooded, at an elevation of 530 feet above mean sea level; Marion County, Illinois; about 1,125 feet north and 160 feet west of the center of sec. 33, T. 1 N., R. 2 E.; USGS Kell, Illinois, topographic quadrangle; lat. 38 degrees 29 minutes 08.2 seconds N. and long. 88 degrees 59 minutes 22.2 seconds W.; UTM Zone 16S, 0326477 Easting, 4261571 Northing; NAD 83:

A1—0 to 5 cm (0 to 2 inches); very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak medium granular structure; friable; many very fine and fine roots; common fine spherical iron-manganese nodules throughout; neutral; abrupt smooth boundary.

A2—5 to 23 cm (2 to 9 inches); dark grayish brown (10YR 4/2) silt loam; weak medium and coarse subangular blocky structure; friable; common very fine and fine roots; common fine and medium spherical iron-manganese nodules throughout; few fine distinct dark brown (7.5YR 3/4) masses of oxidized iron-manganese in the matrix; common fine faint light brownish gray (10YR 6/2) iron depletions in the matrix; about 1 percent fine gravel; neutral; clear smooth boundary.

Bw—23 to 36 cm (9 to 14 inches); brown (10YR 5/3) silt loam; weak medium and coarse angular blocky structure; friable; common very fine and fine roots; common distinct dark grayish brown (10YR 4/2) organic coatings on faces of peds; common medium spherical iron-manganese nodules throughout; common fine faint dark yellowish brown (10YR 3/4) masses of oxidized iron-manganese in the matrix; many fine faint grayish brown (10YR 5/2) iron depletions in the matrix; about 1 percent fine gravel; neutral; abrupt smooth boundary.

Bg—36 to 66 cm (14 to 26 inches); grayish brown (10YR 5/2) loam; weak medium prismatic structure parting to weak coarse angular blocky; friable; common very fine and fine roots; few coarse and many medium spherical iron-manganese nodules throughout; common fine distinct dark yellowish brown (10YR 4/4) and prominent dark yellowish brown (10YR 4/6) masses of oxidized iron-manganese in the matrix; many medium faint light brownish gray (10YR 6/2) iron depletions in the matrix; about 2 percent fine gravel; slightly alkaline; clear smooth boundary.

Cg1—66 to 84 cm (26 to 33 inches); grayish brown (10YR 5/2) loam stratified with thin sand lenses; weak coarse prismatic structure; friable; common very fine and fine roots; common medium irregular manganese coatings; common medium and coarse spherical iron-manganese nodules throughout; few fine prominent dark yellowish brown (10YR 4/6) masses of oxidized iron-manganese in the matrix; many medium faint light brownish gray (10YR 6/2) iron depletions in the matrix; about 2 percent fine gravel; slightly alkaline; clear smooth boundary.

Cg2—84 to 135 cm (33 to 53 inches); grayish brown (10YR 5/2) loam; weak medium and coarse prismatic structure; friable; common very fine and fine roots; many medium irregular manganese coatings; many medium and coarse spherical iron-manganese nodules throughout; common medium faint light brownish gray (10YR 6/2) and light gray (10YR 7/1) iron depletions in the matrix; about 5 percent fine gravel; slightly alkaline; clear wavy boundary.

C—135 to 152 cm (53 to 60 inches); dark yellowish brown (10YR 4/4) fine sandy loam; massive; friable; few very fine and fine roots; many coarse and very coarse spherical and irregular iron-manganese nodules throughout; common medium faint dark brown (7.5YR 3/4) masses of oxidized iron-manganese in the matrix; common coarse distinct light brownish gray (10YR 6/2) iron depletions in the matrix; about 5 percent fine gravel; slightly alkaline.

Range in Characteristics

Depth to the base of the cambic horizon: 56 to 122 cm (22 to 48 inches)

Ap or A horizon:
Hue—10YR
Value—3 to 5

Chroma—2 or 3
Texture—silt loam
Content of rock fragments—0 to 3 percent
Reaction—moderately acid to neutral

BA, Bw, or Bg horizon:
Hue—10YR
Value—4 to 6
Chroma—1 to 6
Texture—silt loam, loam, or fine sandy loam
Content of rock fragments—0 to 10 percent
Reaction—moderately acid to slightly alkaline

C or Cg horizon:
Hue—10YR
Value—4 to 6
Chroma—1 to 4
Texture—loam, sandy loam, or fine sandy loam
Content of rock fragments—0 to 14 percent
Reaction—moderately acid to slightly alkaline

3225A—Holton silt loam, 0 to 2 percent slopes, frequently flooded

Setting

Landform: Narrow flood plains

Map Unit Composition

Holton and similar soils: 90 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

Similar soils:
- Soils that have less sand in the subsoil

Dissimilar soils:
- The well drained Wirt and somewhat poorly drained Banlic soils in landscape positions above those of the Holton soil
- The poorly drained Birds soils in swales; in landscape positions below those of the Holton soil

Properties and Qualities of the Holton Soil

Parent material: Stratified loamy alluvium
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity: About 7.9 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Low
Apparent seasonal high water table (depth, months): 0.5 foot 2.0 feet, January through May
Ponding: None
Frequency and most likely period of flooding: Frequent, November through June
Potential for frost action: High

Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3w
Prime farmland category: Prime farmland where drained and either protected from flooding or not frequently flooded during the growing season
Hydric soil status: Not hydric

Hoyleton Series

Taxonomic classification: Fine, smectitic, mesic Aquollic Hapludalfs

Typical Pedon

Hoyleton silt loam, 0 to 2 percent slopes, at an elevation of 655 feet above mean sea level; Shelby County, Illinois; about 295 feet south and 2,160 feet east of the northwest corner of sec. 15, T. 9 N., R. 5 E.; USGS Shumway, Illinois, topographic quadrangle; lat. 39 degrees 13 minutes 46.1 seconds N. and long. 88 degrees 37 minutes 48.4 seconds W.; UTM Zone 16S, 0359299 Easting, 4343508 Northing; NAD 83:

Ap—0 to 20 cm (0 to 8 inches); dark brown (10YR 3/3) and very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; many very fine roots; few fine spherical iron-manganese concretions throughout; moderately acid; abrupt smooth boundary.

E—20 to 28 cm (8 to 11 inches); brown (10YR 5/3) silt loam; weak thin platy structure; friable; common very fine and few fine roots; common faint dark grayish brown (10YR 4/2) organic stains lining root channels and pores; few fine spherical iron-manganese concretions and stains throughout; strongly acid; clear smooth boundary.

BEt—28 to 36 cm (11 to 14 inches); brown (10YR 5/3) silty clay loam; weak fine subangular blocky structure; friable; few very fine roots; few faint grayish brown (10YR 5/2) clay films and few distinct very pale brown (10YR 7/3) (dry) silt coatings on faces of peds; few fine distinct yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; few fine spherical iron-manganese concretions throughout; strongly acid; clear smooth boundary.

Bt1—36 to 51 cm (14 to 20 inches); brown (10YR 5/3) silty clay loam; strong fine subangular blocky structure; firm; few very fine roots; many distinct grayish brown (10YR 5/2) clay films and many prominent very pale brown (10YR 8/2) (dry) silt coatings on faces of peds; common medium prominent yellowish red (5YR 5/6 and 5/8) masses of oxidized iron in the matrix; common fine spherical iron-manganese concretions throughout; strongly acid; clear smooth boundary.

Bt2—51 to 84 cm (20 to 33 inches); brown (10YR 5/3) silty clay; moderate medium subangular blocky structure; firm; few fine and very fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few distinct dark gray (10YR 4/1) clay films lining root channels and pores; common fine prominent yellowish red (5YR 5/8) masses of oxidized iron and common medium faint light brownish gray (2.5Y 6/2) iron depletions in the matrix; common fine spherical iron-manganese concretions throughout; strongly acid; gradual smooth boundary.

2Bt3—84 to 99 cm (33 to 39 inches); pale brown (10YR 6/3) silty clay loam; weak coarse subangular blocky structure; firm; few fine and very fine roots; few faint grayish brown (10YR 5/2) clay films on faces of peds; few faint very dark grayish brown (10YR 3/2) organo-clay films lining root channels and pores; many medium prominent yellowish brown (10YR 5/8) masses of oxidized iron and common medium faint light brownish gray (2.5Y 6/2) iron depletions in the matrix; common fine spherical iron-manganese concretions throughout; about 10 percent fine sand; strongly acid; gradual smooth boundary.

2BCt—99 to 137 cm (39 to 54 inches); pale brown (10YR 6/3) silt loam; massive; friable; few very fine roots; few faint dark gray (10YR 4/1) clay films lining root channels and pores; few fine prominent yellowish brown (10YR 5/8) and few fine faint yellowish brown (10YR 5/4) masses of oxidized iron in the matrix; common medium faint grayish brown (2.5Y 5/2) iron depletions in the matrix; common fine spherical iron-manganese concretions throughout; about 15 percent fine sand; slightly acid; gradual smooth boundary.

2Cg—137 to 203 cm (54 to 80 inches); brown (7.5YR 5/2) silt loam; massive; friable; many medium prominent strong brown (7.5YR 4/6) masses of oxidized iron and many medium distinct brown (7.5YR 4/4) masses of oxidized iron-manganese in the matrix; few fine spherical iron-manganese concretions throughout; about 25 percent fine sand; slightly acid.

Range in Characteristics

Thickness of the mollic layer: 18 to 23 cm (7 to 9 inches)
Thickness of the loess: 76 to 140 cm (30 to 55 inches)
Depth to carbonates: More than 152 cm (60 inches)
Depth to the base of the argillic horizon: More than 91 cm (36 inches)

Ap or A horizon:
Hue—10YR
Value—2 to 3
Chroma—1 to 3
Texture—silt loam
Content of rock fragments—none
Reaction—very strongly acid to neutral

E or EB horizon (where present):
Hue—10YR
Value—4 to 6
Chroma—3 or 4
Texture—silt loam
Content of rock fragments—none
Reaction—very strongly acid to neutral

BEt or Bt horizon:
Hue—5YR, 7.5YR, or 10YR
Value—4 to 6
Chroma—2 to 4
Texture—silty clay loam or silty clay
Content of rock fragments—none
Reaction—very strongly acid or strongly acid

2Bt or 2BC horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—1 to 4
Texture—silt loam, loam, silty clay loam, or clay loam

Content of rock fragments—0 to 5 percent
Reaction—strongly acid to slightly acid

2C or 2Cg horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—5 or 6
Chroma—1 to 4
Texture—silty clay loam, clay loam, or silt loam
Content of rock fragments—0 to 5 percent by volume
Reaction—moderately acid to neutral

3A—Hoyleton silt loam, 0 to 2 percent slopes

Setting

Landform: Till plains
Position on the landform: Summits

Map Unit Composition

Hoyleton and similar soils: 90 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

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

Dissimilar soils:
- Soils that have more sodium in the subsoil
- The poorly drained Cisne and Huey soils in swales and depressions

Properties and Qualities of the Hoyleton Soil

Parent material: Loess over mixed loess and drift
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 9.6 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.5 to 3.5 percent
Shrink-swell potential: High
Apparent seasonal high water table (depth, months): 1 to 2 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and concrete
Surface runoff class: Low
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2w
Prime farmland category: Prime farmland
Hydric soil status: Not hydric

3B—Hoyleton silt loam, 2 to 5 percent slopes

Setting

Landform: Till plains
Position on the landform: Summits and backslopes

Map Unit Composition

Hoyleton and similar soils: 90 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

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

Dissimilar soils:
- Soils that have more sodium in the subsoil
- The poorly drained Cisne and Huey soils in swales and depressions

Properties and Qualities of the Hoyleton Soil

Parent material: Loess over mixed loess and drift
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 9.9 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.5 to 3.5 percent
Shrink-swell potential: High
Apparent seasonal high water table (depth, months): 1 to 2 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and concrete
Surface runoff class: Low
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2e
Prime farmland category: Prime farmland
Hydric soil status: Not hydric

3B2—Hoyleton silt loam, 2 to 5 percent slopes, eroded

Setting

Landform: Till plains
Position on the landform: Summits and backslopes

Map Unit Composition

Hoyleton and similar soils: 90 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

Similar soils:
- Soils that have less clay in the subsoil
- Soils that have a lighter colored surface layer

Dissimilar soils:
- Soils that have more sodium in the subsoil
- The poorly drained Cisne and Huey soils in swales and depressions

Properties and Qualities of the Hoyleton Soil

Parent material: Loess over mixed loess and drift
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 9.5 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.0 to 2.5 percent
Shrink-swell potential: High
Apparent seasonal high water table (depth, months): 1 to 2 feet, January through May
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: High
Hazard of corrosion: High for steel and concrete
Surface runoff class: Low
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2e
Prime farmland category: Prime farmland
Hydric soil status: Not hydric

912A—Hoyleton-Darmstadt silt loams, 0 to 2 percent slopes

Setting

Landform: Till plains
Position on the landform: Summits

Map Unit Composition

Hoyleton and similar soils: 50 percent
Darmstadt and similar soils: 40 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

Similar soils:
- Soils that have sodium deeper in the profile
- Soils that have a deeper water table

Dissimilar soils:
- The poorly drained Cisne and Huey soils on flats and in depressions; in landscape positions below those of the Hoyleton and Darmstadt soils

Properties and Qualities of the Hoyleton Soil

Parent material: Loess over mixed loess and drift
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Sodium adsorption ratio within a depth of 30 inches: 0 to 5
Available water capacity: About 9.6 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.5 to 3.5 percent
Shrink-swell potential: High
Apparent seasonal high water table (depth, months): 1 to 2 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and concrete
Surface runoff class: Low
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Properties and Qualities of the Darmstadt Soil

Parent material: Loess over mixed loess and drift
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow or slow
Depth to restrictive feature: 10 to 20 inches to a natric horizon
Sodium adsorption ratio within a depth of 30 inches: 13 to 25
Available water capacity: About 10.2 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.0 to 2.5 percent
Shrink-swell potential: Moderate
Apparent seasonal high water table (depth, months): 1 to 2 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Hoyleton—2w; Darmstadt—3s
Prime farmland category: Not prime farmland
Hydric soil status: Hoyleton—not hydric; Darmstadt—not hydric

912B—Hoyleton-Darmstadt silt loams, 2 to 5 percent slopes

Setting

Landform: Till plains
Position on the landform: Summits, shoulders, and backslopes

Map Unit Composition

Hoyleton and similar soils: 50 percent
Darmstadt and similar soils: 40 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

Similar soils:
- Soils that have more sand in the subsoil
- Soils that have sodium deeper in the profile
- Soils that have a deeper water table

Dissimilar soils:
- The moderately well drained Tamalco soils on slight rises; in landscape positions above those of the Hoyleton and Darmstadt soils
- The poorly drained Cisne and Huey soils on flats and in depressions; in landscape positions below those of the Hoyleton and Darmstadt soils

Properties and Qualities of the Hoyleton Soil

Parent material: Loess over mixed loess and drift
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Sodium adsorption ratio within a depth of 30 inches: 0 to 5
Available water capacity: About 9.9 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.5 to 3.5 percent
Shrink-swell potential: High
Apparent seasonal high water table (depth, months): 1 to 2 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and concrete
Surface runoff class: Low
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Properties and Qualities of the Darmstadt Soil

Parent material: Loess over mixed loess and drift
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow or slow
Depth to restrictive feature: 10 to 20 inches to a natric horizon
Sodium adsorption ratio within a depth of 30 inches: 13 to 25
Available water capacity: About 9.2 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.0 to 2.5 percent
Shrink-swell potential: Moderate
Apparent seasonal high water table (depth, months): 1 to 2 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Medium

Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Hoyleton—2e; Darmstadt—3s
Prime farmland category: Not prime farmland
Hydric soil status: Hoyleton—not hydric; Darmstadt—not hydric

912B2—Hoyleton-Darmstadt silt loams, 2 to 5 percent slopes, eroded

Setting

Landform: Till plains
Position on the landform: Summits, shoulders, and backslopes

Map Unit Composition

Hoyleton and similar soils: 50 percent
Darmstadt and similar soils: 40 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

Similar soils:
- Soils that have more sand in the subsoil
- Soils that have sodium deeper in the profile

Dissimilar soils:
- The poorly drained Cisne and Huey soils on flats; in landscape positions above those of the Hoyleton and Darmstadt soils

Properties and Qualities of the Hoyleton Soil

Parent material: Loess over mixed loess and drift
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Sodium adsorption ratio within a depth of 30 inches: 0 to 5
Available water capacity: About 9.5 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.0 to 2.5 percent
Shrink-swell potential: High
Apparent seasonal high water table (depth, months): 1 to 2 feet, January through May
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: High
Hazard of corrosion: High for steel and concrete
Surface runoff class: Low
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Properties and Qualities of the Darmstadt Soil

Parent material: Loess over mixed loess and drift
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Very slow

Permeability below a depth of 60 inches: Very slow or slow
Depth to restrictive feature: 6 to 20 inches to a natric horizon
Sodium adsorption ratio within a depth of 30 inches: 13 to 25
Available water capacity: About 8.7 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.0 to 2.5 percent
Shrink-swell potential: Moderate
Apparent seasonal high water table (depth, months): 1 to 2 feet, January through May
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: High
Hazard of corrosion: High for steel and concrete
Surface runoff class: High
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Hoyleton—2e; Darmstadt—3s
Prime farmland category: Not prime farmland
Hydric soil status: Hoyleton—not hydric; Darmstadt—not hydric

Huey Series

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

Typical Pedon

Huey silt loam, in an area of Cisne-Huey silt loams, 0 to 2 percent slopes, at an elevation of 635 feet above mean sea level; Effingham County, Illinois; about 8 miles west and 2.75 miles north of Effingham; 1,040 feet east and 1,290 feet south of the northwest corner of sec. 12, T. 8 N., R. 4 E.; USGS Shumway, Illinois, topographic quadrangle; lat. 39 degrees 09 minutes 33.8 seconds N. and long. 88 degrees 42 minutes 23.4 seconds W.; UTM Zone 16S, 0352558 Easting, 4335850 Northing; NAD 83:

Ap—0 to 20 cm (0 to 8 inches); dark grayish brown (2.5Y 4/2) silt loam, light brownish gray (2.5Y 6/2) dry; moderate fine granular structure; friable; common fine roots; neutral; abrupt smooth boundary.

Eg—20 to 25 cm (8 to 10 inches); grayish brown (2.5Y 5/2) silt loam; weak thin platy structure parting to weak fine granular; friable; common fine roots; moderately acid; clear smooth boundary.

Btg—25 to 38 cm (10 to 15 inches); dark grayish brown (2.5Y 4/2) silty clay loam; moderate medium subangular blocky structure; firm; few fine roots; few distinct grayish brown (10YR 5/2) clay films on faces of peds; common distinct light gray (10YR 7/2) (dry) clay depletions on faces of peds in the upper 3 inches; few fine prominent yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; few fine black (N 2.5/) manganese accumulations in the matrix; neutral; clear smooth boundary.

Btng1—38 to 46 cm (15 to 18 inches); grayish brown (2.5Y 5/2) silty clay loam; moderate coarse subangular blocky structure; firm; few fine roots; few distinct grayish brown (10YR 5/2) clay films on faces of peds; few fine prominent yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; few fine prominent black (N 2.5/) manganese accumulations in the matrix; moderately alkaline; clear smooth boundary.

Btng2—46 to 58 cm (18 to 23 inches); grayish brown (2.5Y 5/2) silty clay; moderate coarse subangular blocky structure; very firm; few fine roots; common distinct grayish brown (10YR 5/2) clay films on faces of peds; few fine and medium prominent yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; few fine prominent black (N 2.5/) iron-manganese accumulations throughout; few prominent white (N 8/) calcium carbonate accumulations in the matrix; moderately alkaline; gradual smooth boundary.

Btng3—58 to 86 cm (23 to 34 inches); grayish brown (2.5Y 5/2) silty clay loam; moderate coarse subangular blocky structure; firm; few fine roots; few distinct grayish brown (10YR 5/2) clay films on faces of peds; few medium and coarse prominent yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; few fine prominent black (N 2.5/) iron-manganese accumulations throughout; moderately alkaline; gradual smooth boundary.

Btng4—86 to 124 cm (34 to 49 inches); grayish brown (2.5Y 5/2) silty clay loam; moderate coarse angular blocky structure; firm; few fine roots; few distinct grayish brown (10YR 5/2) clay films on faces of peds; common coarse prominent dark yellowish brown (10YR 4/6) masses of oxidized iron-manganese in the matrix; few fine and coarse prominent black (N 2.5/) iron-manganese accumulations throughout; moderately alkaline; gradual smooth boundary.

2BCtg—124 to 145 cm (49 to 57 inches); light brownish gray (10YR 6/2) silt loam; weak coarse subangular blocky structure; firm; few faint grayish brown (10YR 5/2) clay films on faces of peds and lining crayfish holes and pores; about 20 percent fine sand; common coarse prominent yellowish brown (10YR 5/6) and dark yellowish brown (10YR 4/6) masses of oxidized iron in the matrix; few fine prominent black (N 2.5/) iron-manganese accumulations throughout; moderately alkaline; gradual smooth boundary.

2Cg—145 to 165 cm (57 to 65 inches); light brownish gray (10YR 6/2) loam; massive; friable; common coarse prominent dark yellowish brown (10YR 4/6) masses of oxidized iron in the matrix; moderately alkaline.

Range in Characteristics

Thickness of the loess: More than 115 cm (45 inches)
Carbonates: Commonly in the natric horizon
Depth to the base of the natric horizon: More than 115 cm (45 inches)

Ap or A horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—1 or 2
Texture—silt loam
Content of rock fragments—none
Reaction—strongly acid to neutral

E horizon:
Hue—10YR or 2.5Y
Value—5 or 6
Chroma—2
Texture—silt or silt loam
Content of rock fragments—none
Reaction—moderately acid to neutral

Btg horizon:
Hue—10YR or 2.5Y
Value—5 or 6
Chroma—1 or 2
Texture—silty clay loam or silt loam

Content of rock fragments—none
Reaction—slightly acid to moderately alkaline

Btng horizon:
Hue—10YR or 2.5Y
Value—5 or 6
Chroma—1 or 2
Texture—silty clay loam or silt loam
Content of rock fragments—none
Reaction—slightly alkaline to strongly alkaline

2BCg or 2Cg horizon (where present):
Hue—10YR or 2.5Y
Value—5 or 6
Chroma—1 or 2
Texture—silty clay loam, silt loam, or loam
Content of rock fragments—2 to 14 percent
Reaction—neutral to moderately alkaline

120A—Huey silt loam, 0 to 2 percent slopes

Setting

Landform: Depressions on till plains
Position on the landform: Toeslopes

Map Unit Composition

Huey and similar soils: 90 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

Similar soils:
- Soils that have a darker surface layer
- Soils that have less sodium in the subsoil

Dissimilar soils:
- The poorly drained Cisne and Wynoose soils in landscape positions similar to those of the Huey soil

Properties and Qualities of the Huey Soil

Parent material: Loess over mixed loess and drift
Drainage class: Poorly drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow to moderately slow
Depth to restrictive feature: 8 to 16 inches to a natric horizon
Sodium adsorption ratio within a depth of 30 inches: 13 to 30
Available water capacity: About 10.1 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.0 to 2.5 percent
Shrink-swell potential: Moderate
Apparent seasonal high water table (depth, months): At the surface to 1 foot below the surface, January through May
Duration, depth, and most likely period of ponding: Brief, at the surface to 0.5 foot above the surface, January through May
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and concrete

Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3w
Prime farmland category: Not prime farmland
Hydric soil status: Hydric

991A—Cisne-Huey silt loams, 0 to 2 percent slopes

Setting

Landform: Till plains
Position on the landform: Summits

Map Unit Composition

Cisne and similar soils: 50 percent
Huey and similar soils: 40 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

Similar soils:
- Soils that have a thicker dark surface layer
- Soils that have less clay in the subsoil

Dissimilar soils:
- The somewhat poorly drained Darmstadt and Hoyleton soils on ridges and knolls; in landscape positions above those of the Cisne soil

Properties and Qualities of the Cisne Soil

Parent material: Loess over mixed loess and drift
Drainage class: Poorly drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Slow or moderately slow
Depth to restrictive feature: 16 to 21 inches to abrupt textural change
Sodium adsorption ratio within a depth of 30 inches: 0 to 5
Available water capacity: About 9.8 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.5 to 3.5 percent
Shrink-swell potential: High
Apparent seasonal high water table (depth, months): At the surface to 1 foot below the surface, January through May
Duration, depth, and most likely period of ponding: Brief, at the surface to 0.5 foot above the surface, January through May
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Properties and Qualities of the Huey Soil

Parent material: Loess over mixed loess and drift
Drainage class: Poorly drained
Slowest permeability within a depth of 40 inches: Very slow

Permeability below a depth of 60 inches: Very slow to moderately slow
Depth to restrictive feature: 8 to 16 inches to a natric horizon
Sodium adsorption ratio within a depth of 30 inches: 13 to 30
Available water capacity: About 10.1 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.0 to 2.5 percent
Shrink-swell potential: Moderate
Apparent seasonal high water table (depth, months): At the surface to 1 foot below the surface, January through May
Duration, depth, and most likely period of ponding: Brief, at the surface to 0.5 foot above the surface, January through May
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Cisne—3w; Huey—3w
Prime farmland category: Not prime farmland
Hydric soil status: Cisne—hydric; Huey—hydric

Kell Series

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

Typical Pedon

Kell silt loam, in a wooded area of Hickory-Kell silt loams, 18 to 35 percent slopes, at an elevation of about 460 feet above sea level; Jefferson County, Illinois; 1,975 feet west and 1,175 feet north of the southeast corner of sec. 15, T. 3 S., R. 3 E.; USGS Opdyke, Illinois, topographic quadrangle; lat. 38 degrees 15 minutes 40.5 seconds N. and long. 88 degrees 51 minutes 28.1 seconds W.; UTM Zone 16S, 0337463 Easting, 4236433 Northing; NAD 83:

A—0 to 8 cm (0 to 3 inches); very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/1) dry; moderate medium granular structure; friable; common very fine and fine roots throughout; moderately acid; abrupt smooth boundary.
E—8 to 18 cm (3 to 7 inches); 60 percent dark grayish brown (10YR 4/2) and 40 percent dark yellowish brown (10YR 4/4) silt loam; weak thin platy structure; friable; common very fine and fine roots; few fine distinct spherical black (10YR 2/1) iron-manganese concretions throughout; 1 percent shale rock fragments; 1 percent subrounded quartz pebbles; moderately acid; clear smooth boundary.
Bt1—18 to 33 cm (7 to 13 inches); yellowish brown (10YR 5/4) silt loam; strong fine subangular blocky structure; friable; common fine and medium roots; few distinct brown (10YR 4/3) clay films on faces of peds; few fine faint dark brown (10YR 4/3) masses of oxidized iron on faces of peds; common fine distinct spherical black (10YR 2/1) iron-manganese concretions throughout; 1 percent shale rock fragments; 1 percent subrounded quartz pebbles; moderately acid; clear smooth boundary.
2Bt2—33 to 46 cm (13 to 18 inches); yellowish brown (10YR 5/4) silty clay loam; moderate fine subangular blocky structure; friable; few medium roots between peds; many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; many fine distinct irregular yellowish brown (10YR 5/8) masses of oxidized iron

with clear boundaries on faces of peds; few fine distinct spherical black (10YR 2/1) iron-manganese concretions throughout; 1 percent shale rock fragments; 1 percent subrounded quartz pebbles; very strongly acid; clear smooth boundary.

2Bt3—46 to 64 cm (18 to 25 inches); yellowish brown (10YR 5/6) silty clay loam; moderate medium subangular blocky structure; firm; few medium roots between peds; few distinct yellowish brown (10YR 5/4) clay films on faces of peds; few fine distinct irregular yellowish brown (10YR 5/8) masses of oxidized iron with clear boundaries on faces of peds; few fine distinct spherical black (10YR 2/1) iron-manganese concretions throughout; 10 percent shale rock fragments; 1 percent subrounded quartz pebbles; very strongly acid; clear smooth boundary.

2BC—64 to 89 cm (25 to 35 inches); 50 percent yellowish brown (10YR 5/4) and 50 percent light brownish gray (2.5Y 6/2) very channery silty clay loam; weak coarse prismatic structure; firm; few medium roots in cracks; few fine prominent irregular yellowish brown (10YR 5/8) and reddish yellow (7.5YR 6/6) masses of oxidized iron with clear boundaries around rock fragments; 50 percent shale rock fragments; extremely acid; gradual wavy boundary.

3Cr—89 to 152 cm (35 to 60 inches); 50 percent yellowish brown (10YR 5/4) and 50 percent light brownish gray (2.5Y 6/2), weathered shale bedrock; few fine prominent irregular yellowish brown (10YR 5/8) and reddish yellow (7.5YR 6/6) masses of oxidized iron with clear boundaries around rock fragments; extremely acid.

Range in Characteristics

Depth to the base of the argillic horizon: 51 to 102 cm (20 to 40 inches)
Depth to paralithic contact: 51 to 102 cm (20 to 40 inches)

A horizon:
Hue—10YR
Value—3 to 5
Chroma—2 to 4
Texture—silt loam
Content of rock fragments—0 to 10 percent
Reaction—very strongly acid to moderately acid

E horizon:
Hue—10YR
Value—4 to 6
Chroma—2 to 4
Texture—silt loam or loam
Content of rock fragments—0 to 10 percent
Reaction—very strongly acid to moderately acid

Bt horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—4 to 8
Texture—silt loam or silty clay loam
Content of rock fragments—0 to 10 percent
Reaction—very strongly acid to moderately acid

2Bt and 2BC horizons:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 or 5
Chroma—2 to 8
Texture—silty clay loam, loam, silt loam, or clay loam

Content of rock fragments—1 to 15 percent; ranges to 60 percent immediately above the Cr horizon
Reaction—extremely acid to moderately acid

2Cr horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—2 to 8
Kind of bedrock—weathered, level-bedded shale, sandstone, or siltstone

421G—Kell silt loam, 35 to 60 percent slopes

Setting

Landform: Hillslopes
Position on the landform: Backslopes

Map Unit Composition

Kell and similar soils: 90 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

Similar soils:
- Soils that are have bedrock closer to the surface
- Soils that are deeper to bedrock
- Soils that have less clay in the subsoil

Dissimilar soils:
- The moderately well drained Ava soils on the crest of ridges; in landscape positions above those of the Kell soil
- Soils that are subject to flooding; in landscape positions below those of the Kell soil

Properties and Qualities of the Kell Soil

Parent material: Loamy diamicton over residuum derived from sandstone and shale
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow to moderately slow
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Available water capacity: About 5.3 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.0 to 2.5 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: Moderate for steel and high for concrete
Surface runoff class: Very high
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 7e
Prime farmland category: Not prime farmland
Hydric soil status: Not hydric

908D2—Hickory-Kell silt loams, 10 to 18 percent slopes, eroded

Setting

Landform: Hillslopes
Position on the landform: Backslopes

Map Unit Composition

Hickory and similar soils: 60 percent
Kell and similar soils: 30 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

Similar soils:
- Soils that have more clay in the subsoil
- Soils that have bedrock closer to the surface

Dissimilar soils:
- The somewhat poorly drained Bluford and moderately well drained Ava soils along the crest of slopes; in landscape positions above those of the Hickory soil

Properties and Qualities of the Hickory Soil

Parent material: Till
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 7.5 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.0 to 2.5 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Hazard of corrosion: Moderate for steel and high for concrete
Surface runoff class: Medium
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Properties and Qualities of the Kell Soil

Parent material: Loamy diamicton over residuum derived from sandstone and shale
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow to moderately slow
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Available water capacity: About 5 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.0 to 2.5 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Hazard of corrosion: Moderate for steel and high for concrete
Surface runoff class: High

Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Hickory—4e; Kell—4e
Prime farmland category: Not prime farmland
Hydric soil status: Hickory—not hydric; Kell—not hydric

908F—Hickory-Kell silt loams, 18 to 35 percent slopes

Setting

Landform: Hillslopes
Position on the landform: Backslopes

Map Unit Composition

Hickory and similar soils: 55 percent
Kell and similar soils: 35 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

Similar soils:
- Soils that have more clay in the subsoil
- Soils that have bedrock closer to the surface

Dissimilar soils:
- The somewhat poorly drained Bluford and moderately well drained Ava soils along the crest of slopes; in landscape positions above those of the Hickory soil
- Soils that are subject to flooding

Properties and Qualities of the Hickory Soil

Parent material: Till
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 7.9 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: Moderate for steel and high for concrete
Surface runoff class: High
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Properties and Qualities of the Kell Soil

Parent material: Loamy diamicton over residuum derived from sandstone and shale
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow to moderately slow
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Available water capacity: About 5.3 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.0 to 2.5 percent

Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: Moderate for steel and high for concrete
Surface runoff class: High
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Hickory—6e; Kell—6e
Prime farmland category: Not prime farmland
Hydric soil status: Hickory—not hydric; Kell—not hydric

M-W—Miscellaneous water

This map unit consists of manmade areas that are used for industrial or sanitary applications and that contain water most of the year. It includes sewage lagoons, animal waste lagoons, and water treatment facilities.

Newberry Series

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

Typical Pedon

Newberry silt loam, 0 to 2 percent slopes, at an elevation of 432 feet above mean sea level; Richland County, Illinois; about 173 feet south and 2,482 feet west of the northeast corner of sec. 18, T. 3 N., R. 10 E.; USGS Noble, Illinois, topographic quadrangle; lat. 38 degrees 41 minutes 59.6 seconds N. and long. 88 degrees 08 minutes 24.0 seconds W.; UTM Zone 16S, 0400868 Easting, 4284091 Northing; NAD 83:

Ap—0 to 23 cm (0 to 9 inches); very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate medium granular structure; friable; few fine and very fine roots throughout; few fine and common very fine tubular pores; neutral; abrupt smooth boundary.

Eg—23 to 41 cm (9 to 16 inches); light brownish gray (2.5Y 6/2) silt loam; weak medium platy structure parting to weak medium subangular blocky; friable; common very fine roots throughout; few very fine tubular pores; common fine prominent spherical yellowish brown (10YR 5/6) masses of oxidized iron throughout; moderately acid; clear smooth boundary.

BEtg—41 to 51 cm (16 to 20 inches); light brownish gray (10YR 6/2) silty clay loam; weak medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots throughout; few very fine tubular pores; few faint light brownish gray (2.5Y 6/2) clay films and common prominent white (10YR 8/1) (dry) silt coatings on faces of peds; few fine prominent spherical brownish yellow (10YR 6/6) masses of oxidized iron throughout; strongly acid; clear smooth boundary.

Btg1—51 to 76 cm (20 to 30 inches); grayish brown (10YR 5/2) silty clay loam; strong medium prismatic structure; very firm; few very fine roots throughout; few very fine tubular pores; many prominent dark grayish brown (10YR 4/2) clay films and few prominent white (10YR 8/1) (dry) silt coatings on faces of peds; common medium prominent spherical yellowish brown (10YR 5/8) masses of oxidized iron and few fine and medium prominent spherical black (2.5Y 2.5/1) manganese accumulations throughout; very strongly acid; clear smooth boundary.

Btg2—76 to 89 cm (30 to 35 inches); grayish brown (2.5Y 5/2) silty clay loam; strong medium prismatic structure parting to moderate medium subangular blocky; very firm; few very fine roots throughout; few very fine tubular pores; common distinct dark grayish brown (10YR 4/2) and brown (10YR 4/3) clay films and very few prominent white (10YR 8/1) (dry) silt coatings on faces of peds; few fine prominent spherical strong brown (7.5YR 5/8) masses of oxidized iron and common fine and medium prominent spherical black (2.5Y 2.5/1) manganese accumulations throughout; very strongly acid; clear smooth boundary.

2Btg3—89 to 122 cm (35 to 48 inches); grayish brown (2.5Y 5/2) silty clay loam; moderate medium prismatic structure parting to weak medium subangular blocky; very firm; few very fine roots throughout; few very fine tubular pores; few faint dark grayish brown (10YR 4/2) clay films and very few prominent white (10YR 8/1) (dry) silt coatings on faces of peds; common fine and medium prominent spherical dark yellowish brown (10YR 4/6) masses of oxidized iron and few fine and medium prominent spherical black (2.5Y 2.5/1) manganese accumulations throughout; 15 percent krotovina; very strongly acid; clear smooth boundary.

3Btgb1—122 to 160 cm (48 to 63 inches); gray (2.5Y 5/1) clay loam; strong medium prismatic structure; very firm; few very fine roots throughout; few very fine and fine tubular pores; many prominent gray (2.5Y 5/1) clay films and very few prominent white (10YR 8/1) (dry) silt coatings on faces of peds; common medium and coarse prominent irregular strong brown (7.5YR 5/8) masses of oxidized iron and few medium and coarse prominent spherical black (2.5Y 2.5/1) manganese accumulations throughout; about 1 percent fine gravel; neutral; abrupt smooth boundary.

3Btgb2—160 to 203 cm (63 to 80 inches); gray (2.5Y 5/1) clay loam; strong medium and coarse prismatic structure; very firm; few very fine and fine tubular pores; many prominent gray (2.5Y 5/1) clay films and very few distinct brown (10YR 4/3) clay films on faces of peds; common medium and coarse prominent irregular strong brown (7.5YR 5/8) masses of oxidized iron and few coarse prominent irregular black (2.5Y 2.5/1) manganese accumulations throughout; about 1 percent fine gravel; neutral.

Range in Characteristics

Thickness of the mollic layer: 18 to 23 cm (7 to 9 inches)
Thickness of the loess: 75 to 140 cm (30 to 55 inches)
Depth to carbonates: More than 150 cm (60 inches)
Depth to the base of the argillic horizon: More than 100 cm (40 inches)

Ap or A horizon:
Hue—10YR
Value—2 to 3
Chroma—1 or 2
Texture—silt loam
Content of rock fragments—none
Reaction—moderately acid to neutral

Eg horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 or 2
Texture—silt loam
Content of rock fragments—none
Reaction—very strongly acid to moderately acid

Btg or BEtg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silty clay loam or silt loam
Content of rock fragments—none
Reaction—very strongly acid to moderately acid

2Btg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silty clay loam, clay loam, loam, or silt loam
Content of rock fragments—0 to 10 percent
Reaction—very strongly acid to neutral

3Btgb horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—3 to 6
Chroma—0 to 3
Texture—clay loam or silty clay loam
Content of rock fragments—0 to 15 percent
Reaction—moderately acid to neutral

218A—Newberry silt loam, 0 to 2 percent slopes

Setting

Landform: Depressions on till plains
Position on the landform: Toeslopes

Map Unit Composition

Newberry and similar soils: 95 percent
Dissimilar soils: 5 percent

Soils of Minor Extent

Similar soils:
- Soils that have more clay in the subsoil
- Soils that have more sodium in the subsoil
- Soils that have a thicker dark surface layer

Dissimilar soils:
- The somewhat poorly drained Darmstadt and Hoyleton soils on slight rises; in landscape positions above those of the Newberry soil

Properties and Qualities of the Newberry Soil

Parent material: Loess over mixed loess and drift over weathered till
Drainage class: Poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow or moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 10 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.5 to 3.5 percent
Shrink-swell potential: High
Apparent seasonal high water table (depth, months): At the surface to 1 foot below the surface, January through May

Duration, depth, and most likely period of ponding: Brief, at the surface to 0.5 foot above the surface, January through May
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2w
Prime farmland category: Prime farmland where drained
Hydric soil status: Hydric

810—Oil-waste land, brine damaged

This map unit consists of areas that have been damaged by oil brine. The brine is from spills and seepage. The spills are caused by overflow from shallow slush pits or other oilfield activities. The seepage is from broken subsurface lines that carry the oil brine under pressure. Areas of this map unit are characterized by a high or low pH, poor tilth, and a sparse plant cover or a cover of salt-tolerant grasses.

Orion Series

Taxonomic classification: Coarse-silty, mixed, superactive, nonacid, mesic Aquic Udifluvents
Taxadjunct feature: The Orion soils in this survey area have more sand in the particle-size control section than is defined as the range for the series. This difference, however, does not significantly affect the use and management of the soils. These soils are classified as coarse-loamy, mixed, superactive, nonacid, mesic Aquic Udifluvents.

Typical Pedon

Orion silt loam, 0 to 2 percent slopes, frequently flooded, at an elevation of 495 feet above mean sea level; Marion County, Illinois; about 160 feet north and 455 feet east of the center of sec. 1, T. 1 N., R. 1 E.; USGS Centralia East, Illinois, topographic quadrangle; lat. 38 degrees 33 minutes 15.3 seconds N. and long. 89 degrees 02 minutes 23.0 seconds W.; UTM Zone 16S, 0322265 Easting, 4269286 Northing; NAD 83:

Ap—0 to 18 cm (0 to 7 inches); dark grayish brown (10YR 4/2) silt loam, pale brown (10YR 6/3) dry; weak very fine and fine granular structure; friable; few very fine and fine roots; few distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few fine spherical iron-manganese nodules throughout; moderately acid; clear smooth boundary.
Bw1—18 to 48 cm (7 to 19 inches); brown (10YR 4/3) silt loam; weak medium and thick platy structure parting to weak medium granular; friable; few very fine and fine roots; few distinct very dark gray (10YR 3/1) organic coatings on faces of peds; common fine spherical iron-manganese nodules throughout; common fine faint dark grayish brown (10YR 4/2) and common fine distinct gray (10YR 5/1) iron depletions in the matrix; slightly acid; gradual smooth boundary.
Bw2—48 to 61 cm (19 to 24 inches); dark grayish brown (10YR 4/2) silt loam; weak medium subangular blocky structure; friable; few very fine roots; few distinct very dark gray (10YR 3/1) organic coatings on faces of peds; common fine irregular

manganese coatings; common fine spherical iron-manganese nodules throughout; common fine faint dark gray (10YR 4/1) iron depletions in the matrix; common fine distinct yellowish brown (10YR 5/4) masses of oxidized iron in the matrix; moderately acid; abrupt wavy boundary.

Ab1—61 to 89 cm (24 to 35 inches); very dark gray (10YR 3/1) silt loam; weak fine and medium prismatic structure parting to weak fine and medium subangular blocky; friable; few very fine roots; few medium and common fine spherical iron-manganese nodules throughout; many fine faint grayish brown (10YR 5/2) iron depletions in the matrix; few fine distinct yellowish brown (10YR 5/4) masses of oxidized iron in the matrix; about 1 percent fine gravel; moderately acid; clear smooth boundary.

Ab2—89 to 107 cm (35 to 42 inches); very dark gray (10YR 3/1) and very dark grayish brown (10YR 3/2) silt loam; moderate fine and medium prismatic structure; friable; few very fine roots; few medium and common fine spherical iron-manganese nodules throughout; common fine faint grayish brown (10YR 5/2) iron depletions in the matrix; few fine distinct yellowish brown (10YR 5/4) masses of oxidized iron in the matrix; about 2 percent fine and medium gravel; moderately acid; clear smooth boundary.

ACb—107 to 152 cm (42 to 60 inches); grayish brown (10YR 5/2) and very dark gray (10YR 3/1) silt loam; weak medium prismatic structure; firm; few very fine roots; few medium and common fine spherical iron-manganese nodules throughout; common fine prominent yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; about 2 percent fine and medium gravel; neutral.

Range in Characteristics

Ap or A horizon:

Hue—10YR
Value—3 to 6
Chroma—2 or 3
Texture—silt loam
Content of rock fragments—none
Reaction—moderately acid to neutral

Bw or C horizon:

Hue—10YR
Value—3 to 5
Chroma—2 or 3
Texture—silt loam or loam
Content of rock fragments—none
Reaction—moderately acid to neutral

Ab horizon:

Hue—10YR
Value—2 to 3
Chroma—1 or 2
Texture—silt loam
Content of rock fragments—0 to 5 percent
Reaction—moderately acid to neutral

ACb horizon:

Hue—10YR
Value—3 to 6
Chroma—1 or 2
Texture—silt loam or loam
Content of rock fragments—0 to 5 percent
Reaction—moderately acid to neutral

3415A—Orion silt loam, 0 to 2 percent slopes, frequently flooded

Setting

Landform: Narrow flood plains

Map Unit Composition

Orion and similar soils: 90 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

Similar soils:
- Soils that have less sand in the subsoil

Dissimilar soils:
- The well drained Wirt soils in landscape positions above those of the Orion soil
- The poorly drained Birds soils in old oxbows; in landscape positions below those of the Orion soil

Properties and Qualities of the Orion Soil

Parent material: Alluvium
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate
Depth to restrictive feature: More than 80 inches
Available water capacity: About 11.3 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Low
Apparent seasonal high water table (depth, months): 1 to 2 feet, January through May
Ponding: None
Frequency and most likely period of flooding: Frequent, November through June
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3w
Prime farmland category: Prime farmland where protected from flooding or not frequently flooded during the growing season
Hydric soil status: Not hydric

801B—Orthents, silty, undulating

Setting

Landform: Fill; leveled land

General Description

- This map unit is in areas where soil material has been excavated and redeposited during road construction, dam building, or other activities requiring mass disturbance of earthy material.

Map Unit Composition

Orthents and similar soils: 90 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

Similar soils:
- Soils in steeper areas
- Undisturbed soils adjacent to the Orthents

Dissimilar soils:
- Poorly drained soils in undisturbed areas
- The well drained Hickory soils in the steeper areas

Properties and Qualities of the Orthents

Parent material: Mine spoil or earthy fill
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Moderately slow
Permeability below a depth of 60 inches: Moderately slow or moderate
Depth to restrictive feature: More than 80 inches
Available water capacity: About 12 inches to a depth of 60 inches
Content of organic matter in the surface layer: 0.2 to 1.0 percent
Shrink-swell potential: Moderate
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Low
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Moderate

Interpretive Groups

Land capability classification: 2e
Prime farmland category: Not prime farmland
Hydric soil status: Not hydric

Parke Series

Taxonomic classification: Fine-silty, mixed, active, mesic Ultic Hapludalfs

Typical Pedon

Parke silt loam, 2 to 5 percent slopes, eroded, on a slope of 3 percent at an elevation of 421 feet above mean sea level; Wayne County, Illinois; about 2,100 feet east and 85 feet north of the center of sec. 5, T. 3 S., R. 9 E.; USGS Golden Gate, Illinois, topographic quadrangle; lat. 38 degrees 17 minutes 34.9 seconds N. and long. 88 degrees 13 minutes 29.7 seconds W.; UTM Zone 16S, 0392884 Easting, 4239039 Northing; NAD 83:

Ap—0 to 18 cm (0 to 7 inches); brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine granular structure; friable; common very fine roots; moderately acid; abrupt smooth boundary.

Bt1—18 to 30 cm (7 to 12 inches); yellowish brown (10YR 5/6) silty clay loam; moderate fine subangular blocky structure; friable; common very fine roots; many distinct brown (7.5YR 4/4) clay films on faces of peds; slightly acid; clear smooth boundary.

Bt2—30 to 48 cm (12 to 19 inches); strong brown (7.5YR 5/6) silty clay loam; moderate fine and medium subangular blocky structure; firm; few very fine roots; many distinct brown (7.5YR 4/4) clay films on faces of peds; few fine extremely weakly cemented iron-manganese accumulations throughout; moderately acid; clear smooth boundary.

2Bt3—48 to 97 cm (19 to 38 inches); strong brown (7.5YR 5/6) silt loam; moderate medium prismatic structure parting to moderate coarse subangular blocky; firm; few very fine roots; many distinct brown (7.5YR 4/4) clay films on faces of peds; very strongly acid; clear smooth boundary.

3Bt4—97 to 137 cm (38 to 54 inches); strong brown (7.5YR 5/6) loam; moderate medium prismatic structure parting to moderate coarse subangular blocky; friable; many distinct reddish brown (5YR 4/4) clay films on faces of peds; 3 percent gravel; very strongly acid; gradual smooth boundary.

3Bt5—137 to 173 cm (54 to 68 inches); yellowish red (5YR 5/6) loam; weak coarse prismatic structure; friable; common distinct reddish brown (5YR 4/4) clay films on faces of peds; 3 percent gravel; very strongly acid.

Range in Characteristics

Thickness of the loess: 51 to 102 cm (20 to 40 inches)
Depth to the base of the argillic horizon: More than 203 cm (80 inches)

Ap or A horizon:
Hue—10YR
Value—2 to 5
Chroma—2 to 6
Texture—silt loam
Content of rock fragments—none
Reaction—strongly acid to neutral

EB or E horizon (where present):
Hue—10YR
Value—4 to 6
Chroma—2 to 4
Texture—silt loam
Content of rock fragments—none
Reaction—strongly acid to neutral

Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—4 to 6
Texture—silty clay loam or silt loam
Content of rock fragments—none
Reaction—very strongly acid to slightly acid

2Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—4 to 6
Texture—silt loam
Content of rock fragments—none
Reaction—very strongly acid to moderately acid

3Btb horizon:
Hue—2.5YR to 7.5YR; hue of 5YR or redder is present in some part
Value—3 to 5
Chroma—3 to 6
Texture—sandy clay loam, loam, sandy loam, or fine sandy loam
Content of rock fragments—0 to 10 percent
Reaction—very strongly acid or strongly acid

15B2—Parke silt loam, 2 to 5 percent slopes, eroded

Setting

Landform: Eskers on uplands
Position on the landform: Summits, shoulders, and backslopes

Map Unit Composition

Parke and similar soils: 90 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

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

Dissimilar soils:
- The moderately well drained Ava and somewhat poorly drained Bluford soils in landscape positions below those of the Parke soil

Properties and Qualities of the Parke Soil

Parent material: Loess or other silty material and the underlying paleosol that formed in loamy outwash
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate
Depth to restrictive feature: More than 80 inches
Available water capacity: About 9 inches to a depth of 60 inches
Content of organic matter in the surface layer: 0.5 to 2.0 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: High
Hazard of corrosion: Moderate for steel and high for concrete
Surface runoff class: Low
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2e
Prime farmland category: Prime farmland
Hydric soil status: Not hydric

Passport Series

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

Typical Pedon

Passport silt loam, 5 to 10 percent slopes, eroded, on a slope of 5 percent at an elevation of 440 feet above mean sea level; Clay County, Illinois; about 1.75 miles west and 1.75 miles south of the village of Passport; 1,775 feet north and 135 feet east of the southwest corner of sec. 24, T. 4 N., R. 8 E.; USGS Sailor Springs, Illinois, topographic quadrangle; lat. 38 degrees 45 minutes 55.8 seconds N. and long. 88 degrees 16 minutes 33.8 seconds W.; UTM Zone 16S, 0389137 Easting, 4291529 Northing; NAD 83:

Ap—0 to 10 cm (0 to 4 inches); 90 percent dark grayish brown (10YR 4/2) silt loam, light yellowish brown (10YR 6/4) dry; mixed with 10 percent yellowish brown (10YR 5/4) subsoil material; weak very fine and fine granular structure; friable; few very fine roots throughout; about 1 percent gravel; neutral; abrupt smooth boundary.

Bt1—10 to 18 cm (4 to 7 inches); yellowish brown (10YR 5/4) clay loam; moderate fine prismatic structure parting to moderate fine angular blocky; firm; few very fine roots throughout; very few distinct very dark grayish brown (10YR 3/2) organic coatings and very few distinct pale brown (10YR 6/3) (dry) clay depletions in root channels and pores; common distinct brown (10YR 4/3) clay films on faces of peds; common fine distinct reddish brown (5YR 4/4) masses of oxidized iron-manganese and common fine distinct yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; about 1 percent gravel; neutral; clear smooth boundary.

Bt2—18 to 30 cm (7 to 12 inches); brown (10YR 5/3) clay loam; moderate fine and medium prismatic structure parting to moderate fine and medium angular blocky; firm; few very fine roots throughout; few distinct pale brown (10YR 6/3) (dry) clay depletions in root channels and pores and on faces of peds; common distinct brown (10YR 4/3) clay films on faces of peds; common fine distinct reddish brown (5YR 4/4) masses of oxidized iron-manganese and common fine distinct yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; about 1 percent gravel; slightly acid; clear smooth boundary.

Bt3—30 to 56 cm (12 to 22 inches); brown (10YR 5/3) clay loam; weak medium prismatic structure parting to moderate medium angular blocky; firm; few very fine roots between peds; few distinct pale brown (10YR 6/3) (dry) clay depletions in root channels and pores; few distinct dark grayish brown (10YR 4/2) and common distinct brown (10YR 4/3) clay films on faces of peds; common fine and medium faint grayish brown (10YR 5/2) iron depletions and many medium distinct yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; about 1 percent gravel; very strongly acid; clear smooth boundary.

Btg1—56 to 81 cm (22 to 32 inches); light brownish gray (10YR 6/2) clay loam; weak coarse angular blocky structure; firm; few very fine roots between peds; few distinct dark grayish brown (10YR 4/2) clay films on faces of peds; many medium prominent yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; about 1 percent gravel; strongly acid; clear smooth boundary.

Btg2—81 to 97 cm (32 to 38 inches); grayish brown (10YR 5/2) clay loam; moderate medium angular blocky structure; firm; few very fine roots between peds; few distinct gray (10YR 5/1) clay films on faces of peds and lining root channels and pores; common medium faint brown (7.5YR 4/3) masses of oxidized iron-manganese and common medium prominent yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; common fine and medium distinct dendritic black (10YR 2/1) manganese accumulations between peds; about 1 percent gravel; moderately acid; clear smooth boundary.

2Btg3—97 to 130 cm (38 to 51 inches); gray (10YR 6/1) clay loam; moderate medium prismatic structure parting to moderate medium angular blocky; firm; few very fine roots between peds; few distinct reddish brown (5YR 4/4) and common distinct dark gray (10YR 4/1) and gray (10YR 5/1) clay films on faces of peds; common medium distinct brown (7.5YR 4/3) masses of oxidized iron-manganese and many medium prominent strong brown (7.5YR 4/6 and 5/6) masses of oxidized iron in the matrix; common fine and medium prominent irregular black (7.5YR 2.5/1) manganese accumulations throughout; common fine spherical white (10YR 8/1) masses of barite throughout; about 2 percent gravel; slightly acid; gradual wavy boundary.

2Btg4—130 to 150 cm (51 to 59 inches); gray (10YR 6/1) clay loam; moderate medium prismatic structure parting to moderate medium angular blocky; firm; few distinct brown (7.5YR 4/3) clay films in root channels and pores; many distinct gray (10YR 5/1) clay films on faces of peds; common medium prominent strong brown (7.5YR 5/6) masses of oxidized iron in the matrix; common fine and medium prominent irregular black (7.5YR 2.5/1) manganese accumulations throughout; common fine spherical white (10YR 8/1) masses of barite throughout; about 2 percent gravel; neutral; clear wavy boundary.

2Btg5—150 to 173 cm (59 to 68 inches); gray (10YR 6/1) clay loam; weak medium prismatic structure parting to moderate medium angular blocky; firm; few distinct gray (10YR 5/1) clay films on faces of peds; many distinct brown (7.5YR 4/3) clay films on faces of peds and lining root channels and pores; many medium prominent strong brown (7.5YR 5/6) masses of oxidized iron in the matrix; common medium prominent irregular black (7.5YR 2.5/1) manganese accumulations throughout; common fine spherical white (10YR 8/1) masses of barite throughout; about 2 percent gravel; neutral; clear wavy boundary.

2Btg6—173 to 198 cm (68 to 78 inches); gray (2.5Y 6/1) clay loam; weak medium prismatic structure; firm; few distinct gray (10YR 5/1) clay films on faces of peds and lining root channels and pores; few distinct brown (7.5YR 4/3) clay films in root channels and pores; common medium distinct brown (10YR 5/3) masses of oxidized iron-manganese and common medium prominent yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; common fine distinct spherical white (10YR 8/1) masses of barite throughout; about 2 percent gravel; neutral; abrupt wavy boundary.

2BCtb—198 to 295 cm (78 to 116 inches); 90 percent yellowish brown (10YR 5/6) and 10 percent gray (10YR 6/1) loam; massive; firm; common prominent brown (7.5YR 4/2) clay films in root channels and pores; common fine and medium prominent irregular black (7.5YR 2.5/1) manganese accumulations throughout; common fine spherical white (10YR 8/1) masses of barite throughout; about 3 percent gravel; slightly alkaline; gradual wavy boundary.

2C—295 to 424 cm (116 to 167 inches); 50 percent yellowish brown (10YR 5/6) and 50 percent brown (10YR 5/3) loam; massive; firm; few distinct dark grayish brown (10YR 4/2) clay films on horizontal faces of soil fragments in the upper 5 inches; common fine prominent irregular black (7.5YR 2.5/1) manganese accumulations on horizontal faces of soil fragments; common fine prominent spherical light gray (10YR 7/2) masses and nodules of calcium carbonate and common fine prominent spherical white (10YR 8/1) masses of barite throughout; about 6 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the loess: Less than 25 cm (10 inches)
Depth to carbonates: More than 150 cm (60 inches)
Depth to the base of the argillic horizon: 100 to 200 cm (40 to 80 inches)

Ap or A horizon:
Hue—10YR
Value—3 to 5
Chroma—2 to 4
Texture—silt loam
Content of rock fragments—less than 1 percent
Reaction—strongly acid to neutral

Bt or Btg horizon:
Hue—10YR
Value—4 to 6

Chroma—1 to 6
Texture—silty clay loam, clay loam, silt loam, or loam
Content of rock fragments—less than 5 percent
Reaction—very strongly acid to neutral

2Bt or 2Btg horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—1 to 8
Texture—clay loam, loam, silt loam, silty clay loam, or silty clay
Content of rock fragments—1 to 5 percent
Reaction—strongly acid to neutral

2Btgb, 2BCb, 2C, or 2Cg horizon:
Hue—7.5YR, 10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 8
Texture—clay loam or loam
Content of rock fragments—1 to 10 percent
Reaction—neutral to moderately alkaline

652C2—Passport silt loam, 5 to 10 percent slopes, eroded

Setting

Landform: Till plains
Position on the landform: Shoulders and backslopes

Map Unit Composition

Passport and similar soils: 90 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

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

Dissimilar soils:
- The somewhat poorly drained Bluford and moderately well drained Ava soils in landscape positions above those of the Passport soil

Properties and Qualities of the Passport Soil

Parent material: Mixed loess and drift over a paleosol that formed in till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 7.8 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.0 to 2.5 percent
Shrink-swell potential: Moderate
Apparent seasonal high water table (depth, months): 1 to 2 feet, January through May
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Hazard of corrosion: High for steel and concrete

Surface runoff class: Medium
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3e
Prime farmland category: Not prime farmland
Hydric soil status: Not hydric

652D2—Passport silt loam, 10 to 18 percent slopes, eroded

Setting

Landform: Hillslopes on till plains
Position on the landform: Shoulders and backslopes

Map Unit Composition

Passport and similar soils: 90 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

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

Dissimilar soils:
- The somewhat poorly drained Bluford and moderately well drained Ava soils in landscape positions above those of the Passport soil

Properties and Qualities of the Passport Soil

Parent material: Mixed loess and drift over a paleosol that formed in till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 7.8 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.0 to 2.5 percent
Shrink-swell potential: Moderate
Apparent seasonal high water table (depth, months): 1 to 2 feet, January through May
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Hazard of corrosion: High for steel and concrete
Surface runoff class: Medium
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 4e
Prime farmland category: Not prime farmland
Hydric soil status: Not hydric

888C2—Passport-Grantfork silt loams, 5 to 10 percent slopes, eroded

Setting

Landform: Till plains
Position on the landform: Shoulders and backslopes

Map Unit Composition

Passport and similar soils: 50 percent
Grantfork and similar soils: 35 percent
Dissimilar soils: 15 percent

Soils of Minor Extent

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

Dissimilar soils:
- The poorly drained Cisne soils on flats; in landscape positions above those of the Passport soil

Properties and Qualities of the Passport Soil

Parent material: Mixed loess and drift over a paleosol that formed in till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: More than 80 inches
Sodium adsorption ratio within a depth of 30 inches: 0 to 3
Available water capacity: About 7.8 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.0 to 2.5 percent
Shrink-swell potential: Moderate
Apparent seasonal high water table (depth, months): 1 to 2 feet, January through May
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Hazard of corrosion: High for steel and concrete
Surface runoff class: Medium
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Properties and Qualities of the Grantfork Soil

Parent material: Mixed loess and drift over a paleosol that formed in till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: More than 80 inches
Sodium adsorption ratio within a depth of 30 inches: 5 to 13
Available water capacity: About 8.1 inches to a depth of 60 inches
Content of organic matter in the surface layer: 0.5 to 2.0 percent
Shrink-swell potential: Moderate

Apparent seasonal high water table (depth, months): 1 to 2 feet, January through May
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Medium
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Passport—3e; Grantfork—3e
Prime farmland category: Not prime farmland
Hydric soil status: Passport—not hydric; Grantfork—not hydric

947D2—Hickory-Passport silt loams, 10 to 18 percent slopes, eroded

Setting

Landform: Hillslopes on till plains
Position on the landform: Backslopes

Map Unit Composition

Hickory and similar soils: 45 percent
Passport and similar soils: 40 percent
Dissimilar soils: 15 percent

Soils of Minor Extent

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

Dissimilar soils:
- The moderately well drained Ava soils on the crest of slopes; in landscape positions above those of the Passport soil
- Soils that are subject to flooding

Properties and Qualities of the Hickory Soil

Parent material: Loamy till
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 7.3 inches to a depth of 60 inches
Content of organic matter in the surface layer: 0.5 to 2.0 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Hazard of corrosion: Moderate for steel and high for concrete
Surface runoff class: Medium
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Properties and Qualities of the Passport Soil

Parent material: Mixed loess and drift over a paleosol that formed in till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 7.8 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.0 to 2.5 percent
Shrink-swell potential: Moderate
Apparent seasonal high water table (depth, months): 1 to 2 feet, January through May
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Hazard of corrosion: High for steel and concrete
Surface runoff class: Medium
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Hickory—4e; Passport—4e
Prime farmland category: Not prime farmland
Hydric soil status: Hickory—not hydric; Passport—not hydric

947D3—Hickory-Passport clay loams, 10 to 18 percent slopes, severely eroded

Setting

Landform: Hillslopes on till plains
Position on the landform: Backslopes

Map Unit Composition

Hickory and similar soils: 45 percent
Passport and similar soils: 40 percent
Dissimilar soils: 15 percent

Soils of Minor Extent

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

Dissimilar soils:
- The moderately well drained Ava soils on the crest of slopes; in landscape positions above those of the Passport soil
- Soils that are subject to flooding

Properties and Qualities of the Hickory Soil

Parent material: Till
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 6.9 inches to a depth of 60 inches

Content of organic matter in the surface layer: 0.3 to 1.0 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Accelerated erosion: The surface layer is mostly subsoil material.
Potential for frost action: Moderate
Hazard of corrosion: Moderate for steel and high for concrete
Surface runoff class: Medium
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Properties and Qualities of the Passport Soil

Parent material: Mixed loess and drift over a paleosol that formed in till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 7.5 inches to a depth of 60 inches
Content of organic matter in the surface layer: 0.3 to 1.0 percent
Shrink-swell potential: Moderate
Apparent seasonal high water table (depth, months): 1 to 2 feet, January through May
Ponding: None
Flooding: None
Accelerated erosion: The surface layer is mostly subsoil material.
Potential for frost action: Moderate
Hazard of corrosion: High for steel and concrete
Surface runoff class: Medium
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Hickory—4e; Passport—4e
Prime farmland category: Not prime farmland
Hydric soil status: Hickory—not hydric; Passport—not hydric

Plumfield Series

Taxonomic classification: Fine-silty, mixed, active, mesic Aquic Fragiudalfs

Typical Pedon

Plumfield silty clay loam, 5 to 10 percent slopes, on a slope of 8 percent at an elevation of 404 feet above mean sea level; Franklin County, Illinois; about 500 feet east and 2,060 feet south of the northwest corner of sec. 18, T. 7 S., R. 2 E.; USGS Christopher, Illinois, topographic quadrangle; lat. 37 degrees 54 minutes 56 seconds N. and long. 89 degrees 02 minutes 15 seconds W.; UTM Zone 16, 0320900 Easting, 4198402 Northing; NAD 83:

Ap—0 to 13 cm (0 to 5 inches); yellowish brown (10YR 5/4) silty clay loam, light yellowish brown (10YR 6/4) dry; weak fine granular structure; friable; common very fine and fine roots throughout; very strongly acid; abrupt smooth boundary.

Btx1—13 to 18 cm (5 to 7 inches); yellowish brown (10YR 5/6) silty clay loam; strong thick platy structure parting to strong medium platy; very firm; brittle; few very fine roots between peds; few faint dark yellowish brown (10YR 4/6) clay films on faces of peds and in pores; common fine prominent spherical very dark gray (10YR 3/1) extremely weakly cemented iron-manganese accumulations throughout; extremely acid; abrupt smooth boundary.

2Btx2—18 to 30 cm (7 to 12 inches); yellowish brown (10YR 5/6) silty clay loam; moderate medium prismatic structure parting to weak medium subangular blocky; very firm; brittle; few very fine roots between peds; common faint grayish brown (10YR 5/2) and brown (10YR 5/3) clay films on faces of peds and in pores; few prominent white (10YR 8/1) (dry) silt coatings on faces of peds and in pores; common fine and medium prominent grayish brown (10YR 5/2) iron depletions in the matrix; common fine prominent spherical very dark gray (10YR 3/1) extremely weakly cemented iron-manganese accumulations throughout; extremely acid; clear smooth boundary.

2Btx3—30 to 91 cm (12 to 36 inches); yellowish brown (10YR 5/6) silt loam; weak very coarse prismatic structure; very firm; brittle; few very fine roots between peds; few faint dark yellowish brown (10YR 4/6) clay films on faces of peds and in pores; common fine prominent grayish brown (10YR 5/2) iron depletions in the matrix; common fine prominent spherical very dark gray (10YR 3/1) extremely weakly cemented iron-manganese accumulations throughout; 1 percent pebbles (igneous); very strongly acid; gradual smooth boundary.

3Btgb1—91 to 117 cm (36 to 46 inches); grayish brown (10YR 5/2) silty clay loam; moderate coarse and medium prismatic structure parting to moderate medium angular blocky; very firm; few distinct dark yellowish brown (10YR 4/6) and few faint brown (10YR 5/3) and gray (10YR 5/1) clay films on faces of peds and in pores; many fine and medium prominent yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; common fine faint irregular very dark gray (10YR 3/1) extremely weakly cemented iron-manganese accumulations throughout; common fine irregular barite crystals; 1 percent gravel; strongly acid; gradual smooth boundary.

3Btgb2—117 to 142 cm (46 to 56 inches); grayish brown (10YR 5/2) silty clay loam; weak coarse prismatic structure; very firm; few distinct dark yellowish brown (10YR 4/6) and few faint brown (10YR 5/3) and gray (10YR 5/1) clay films on faces of peds and in pores; many fine and medium prominent yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; common fine faint irregular very dark gray (10YR 3/1) extremely weakly cemented iron-manganese accumulations throughout; common fine irregular barite crystals; 1 percent gravel; moderately acid; gradual smooth boundary.

3Btgb3—142 to 178 cm (56 to 70 inches); grayish brown (10YR 5/2) silty clay loam; weak very coarse prismatic structure; very firm; common faint gray (10YR 5/1) and brown (10YR 5/3) pores and few distinct dark yellowish brown (10YR 4/6) clay films on faces of peds and in pores; many fine and medium prominent yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; many fine and medium faint irregular very dark gray (10YR 3/1) extremely weakly cemented iron-manganese accumulations throughout; common fine irregular barite crystals; 1 percent gravel; slightly acid.

Range in Characteristics

Thickness of the Peoria Loess: 0 to 51 centimeters (0 to 20 inches)
Depth to the fragipan: 13 to 51 centimeters (5 to 20 inches)
Depth to the base of soil development and depth to bedrock: More than 152 centimeters (60 inches)

Ap horizon:
Hue—10YR
Value—4 or 5
Chroma—2 to 4

Texture—silty clay loam or silt loam
Clay content—averages 20 to 35 percent
Sand content—averages 2 to 15 percent
Reaction—very strongly acid to neutral

Btx horizon:
Hue—10YR
Value—4 to 6
Chroma—2 to 8
Texture—silt loam or silty clay loam
Clay content—averages 20 to 30 percent
Sand content—averages 2 to 15 percent
Reaction—extremely acid to moderately acid

2Btx horizon:
Hue—10YR
Value—4 to 6
Chroma—2 to 8
Texture—silt loam, silty clay loam, or loam
Clay content—averages 20 to 30 percent
Sand content—averages 10 to 25 percent
Content of rock fragments—0 to 3 percent
Reaction—extremely acid to strongly acid

3Btg horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—1 or 2
Texture—loam, silt loam, clay loam, or silty clay loam
Clay content—averages 20 to 35 percent
Sand content—averages 15 to 35 percent
Content of rock fragments—1 to 10 percent
Reaction—extremely acid to slightly acid

10C—Plumfield silty clay loam, 5 to 10 percent slopes

Setting

Landform: Till plains
Position on the landform: Shoulders and backslopes

Map Unit Composition

Plumfield and similar soils: 90 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

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

Dissimilar soils:
- The somewhat poorly drained Atlas and Passport soils on side slopes; in landscape positions below those of the Plumfield soil
- The well drained Hickory and Kell soils on the steeper slopes; in landscape positions below those of the Plumfield soil

Properties and Qualities of the Plumfield Soil

Parent material: Loess over drift
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: 5 to 20 inches to a fragipan
Available water capacity: About 6.9 inches to a depth of 60 inches
Content of organic matter in the surface layer: 0.3 to 1.0 percent
Shrink-swell potential: Moderate
Perched seasonal high water table (depth, months): 1.5 to 3.5 feet, February through April
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and concrete
Surface runoff class: Very high
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 4s
Prime farmland category: Not prime farmland
Hydric soil status: Not hydric

Racoon Series

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

Typical Pedon

Racoon silt loam, 0 to 2 percent slopes, at an elevation of 425 feet above mean sea level; Saline County, Illinois; about 135 feet north and 2,095 feet east of the center of sec. 30, T. 7 S., R. 5 E.; USGS Akin, Illinois, topographic quadrangle; lat. 37 degrees 53 minutes 07.2 seconds N. and long. 88 degrees 41 minutes 25.3 seconds W.; UTM Zone 16S, 0351356 Easting, 4194441 Northing; NAD 83:

Ap—0 to 15 cm (0 to 6 inches); dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; moderate fine granular structure; friable; common fine faint very dark grayish brown (10YR 3/2) extremely weakly cemented iron-manganese accumulations throughout; neutral; abrupt smooth boundary.

Eg1—15 to 25 cm (6 to 10 inches); dark grayish brown (10YR 4/2) silt loam; weak thin platy structure; firm; common faint very dark grayish brown (10YR 3/2) extremely weakly cemented iron-manganese accumulations throughout; neutral; abrupt smooth boundary.

Eg2—25 to 36 cm (10 to 14 inches); dark grayish brown (10YR 4/2) silt loam; weak medium platy structure parting to weak fine granular; friable; common fine faint grayish brown (10YR 5/2) and few fine distinct light gray (10YR 7/1) iron depletions in the matrix; common fine faint very dark grayish brown (10YR 3/2) extremely weakly cemented iron-manganese accumulations throughout; strongly acid; clear smooth boundary.

Eg3—36 to 76 cm (14 to 30 inches); gray (10YR 6/1) silt loam; weak medium platy structure parting to weak fine granular; friable; common very fine tubular pores; common medium prominent yellowish brown (10YR 5/6) and brownish yellow (10YR 6/6) masses of oxidized iron in the matrix; many fine prominent black (10YR 2/1) extremely weakly cemented iron-manganese accumulations throughout; few grayish brown (10YR 5/2) krotovinas; very strongly acid; clear smooth boundary.

Btg1—76 to 94 cm (30 to 37 inches); gray (10YR 6/1) silty clay loam; weak medium prismatic structure parting to weak fine subangular blocky; firm; few very fine tubular pores; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common fine prominent yellowish brown (10YR 5/6) and brownish yellow (10YR 6/6) masses of oxidized iron in the matrix; common fine black iron-manganese concretions throughout; very strongly acid; clear smooth boundary.

Btg2—94 to 119 cm (37 to 47 inches); gray (10YR 6/1) silty clay loam; moderate medium prismatic structure parting to weak medium subangular blocky; firm; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; many fine prominent yellowish brown (10YR 5/6) masses of oxidized iron and few fine faint light gray (10YR 7/1) iron depletions in the matrix; common fine black iron-manganese concretions throughout; very strongly acid; clear smooth boundary.

Btg3—119 to 150 cm (47 to 59 inches); gray (10YR 6/1) silty clay loam; weak medium prismatic structure parting to weak medium subangular blocky; firm; few faint gray (10YR 5/1) and common prominent dark olive gray (5Y 3/2) clay films on faces of peds; common medium prominent strong brown (7.5YR 5/6) masses of oxidized iron and brown (7.5YR 4/4) masses of oxidized iron-manganese in the matrix; few fine black iron-manganese concretions throughout; strongly acid; clear smooth boundary.

Cg—150 to 185 cm (59 to 73 inches); gray (5Y 6/1) and gray (10YR 6/1) silt loam; massive; friable; many coarse faint and distinct grayish brown (10YR 5/2) iron depletions and many coarse prominent brown (7.5YR 4/4) masses of oxidized iron-manganese in the matrix; slightly acid increasing to neutral in the lower part.

Range in Characteristics

Depth to the base of the argillic horizon: 100 to 200 cm (40 to 80 inches)

Ap or A horizon:
Hue—10YR
Value—3 to 6
Chroma—2 or 3
Texture—silt loam
Content of rock fragments—0 to 2 percent
Reaction—very strongly acid to neutral

Eg horizon:
Hue—10YR or 2.5Y
Value—4 to 7
Chroma—1 or 2
Texture—silt loam
Content of rock fragments—0 to 2 percent
Reaction—very strongly acid to neutral

Btg horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—4 to 7
Chroma—0 to 2
Texture—dominantly silty clay loam; silt loam in individual subhorizons
Content of rock fragments—0 to 2 percent
Reaction—very strongly acid or strongly acid

Cg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 7

Chroma—1 or 2
Texture—silt loam or loam
Content of rock fragments—0 to 2 percent
Reaction—moderately acid to neutral

109A—Racoon silt loam, 0 to 2 percent slopes

Setting

Landform: Depressions on till plains
Position on the landform: Footslopes

Map Unit Composition

Racoon and similar soils: 90 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

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

Dissimilar soils:
- The somewhat poorly drained Bluford soils in landscape positions above those of the Racoon soil

Properties and Qualities of the Racoon Soil

Parent material: Mixture of loess and local silty alluvium
Drainage class: Poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 10.9 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.0 to 2.5 percent
Shrink-swell potential: Moderate
Apparent seasonal high water table (depth, months): At the surface to 1 foot below the surface, January through May
Duration, depth, and most likely period of ponding: Brief, at the surface to 0.5 foot above the surface, January through May
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3w
Prime farmland category: Prime farmland where drained
Hydric soil status: Hydric

Richview Series

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

Typical Pedon

Richview silt loam, 5 to 10 percent slopes, eroded, on a slope of 8 percent at an elevation of 625 feet above mean sea level; Shelby County, Illinois; about 2 miles southwest of Stewardson; 1,914 feet west and 100 feet north of the southeast corner of sec. 8, T. 9 N., R. 5 E.; USGS Shumway, Illinois, topographic quadrangle; lat. 39 degrees 13 minutes 50.7 seconds N. and long. 88 degrees 39 minutes 48.9 seconds W.; UTM Zone 16S, 0356412 Easting, 4343701 Northing; NAD 83:

Ap—0 to 18 cm (0 to 7 inches); very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate medium granular structure; friable; slightly acid; clear smooth boundary.

E—18 to 30 cm (7 to 12 inches); dark grayish brown (10YR 4/2) silt loam; some mixing of very dark grayish brown (10YR 3/2) from the horizon above; weak thin platy structure parting to weak fine granular; friable; moderately acid; clear smooth boundary.

Bt1—30 to 43 cm (12 to 17 inches); dark yellowish brown (10YR 4/4) silt loam; moderate medium subangular blocky structure; friable; many faint brown (10YR 4/3) clay films on faces of peds; moderately acid; clear smooth boundary.

Bt2—43 to 61 cm (17 to 24 inches); brown (7.5YR 4/4) silty clay loam; strong medium subangular blocky structure; firm; many distinct brown (10YR 5/3) clay films on faces of peds; common fine faint reddish brown (5YR 4/4) masses of oxidized iron-manganese in the matrix; strongly acid; clear smooth boundary.

Bt3—61 to 79 cm (24 to 31 inches); brown (7.5YR 4/4) silty clay loam; moderate medium subangular blocky structure; firm; many prominent grayish brown (10YR 5/2) clay films on faces of peds; few fine faint reddish brown (5YR 4/4) masses of oxidized iron-manganese in the matrix; very strongly acid; abrupt smooth boundary.

Bt4—79 to 102 cm (31 to 40 inches); brown (7.5YR 4/4) silty clay loam; moderate medium angular blocky structure; firm; many prominent dark gray (10YR 4/1) clay films on faces of peds; common fine distinct light brownish gray (10YR 6/2) iron depletions in the matrix; many dark iron-manganese concretions throughout; very strongly acid; clear smooth boundary.

2Bt5—102 to 140 cm (40 to 55 inches); dark yellowish brown (10YR 4/4) silt loam; weak coarse angular blocky structure; friable; few distinct gray (10YR 5/1) clay films on faces of peds; common fine distinct light brownish gray (10YR 6/2) iron depletions in the matrix; sand grains readily evident (about 15 percent sand); strongly acid; clear smooth boundary.

2BC—140 to 152 cm (55 to 60 inches); dark yellowish brown (10YR 4/4) loam; weak coarse subangular blocky structure; friable; many medium distinct brown (7.5YR 5/2) iron depletions in the matrix; moderately acid; clear smooth boundary.

2C1—152 to 191 cm (60 to 75 inches); dark yellowish brown (10YR 4/4) sandy loam; massive; very friable; many medium distinct brown (7.5YR 5/2) iron depletions in the matrix; slightly acid; clear smooth boundary.

2C2—191 to 203 cm (75 to 80 inches); dark yellowish brown (10YR 4/4) sandy loam; massive; very friable; many medium distinct brown (7.5YR 5/2) iron depletions in the matrix; neutral.

Range in Characteristics

Thickness of the loess: 75 to 125 cm (30 to 50 inches)
Depth to carbonates: More than 165 cm (65 inches)

Ap or A horizon:
Hue—10YR
Value—2 to 3
Chroma—1 to 3

Texture—silt loam
Content of rock fragments—none
Reaction—strongly acid to neutral

E horizon:
Hue—10YR
Value—4 or 5
Chroma—2 or 3
Texture—silt loam
Content of rock fragments—none
Reaction—strongly acid to neutral

Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 to 6
Texture—silty clay loam; silt loam in some subhorizons
Content of rock fragments—none
Reaction—very strongly acid to slightly acid

2Bt or 2BC horizon:
Hue—10YR
Value—4 to 6
Chroma—3 to 6
Texture—silt loam, loam, or clay loam
Content of rock fragments—1 to 15 percent
Reaction—very strongly acid to slightly acid

2C horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 4
Texture—loam, sandy loam, or silt loam
Content of rock fragments—1 to 15 percent
Reaction—slightly acid or neutral

4B—Richview silt loam, 2 to 5 percent slopes

Setting

Landform: Eskers on till plains
Position on the landform: Shoulders and backslopes

Map Unit Composition

Richview and similar soils: 92 percent
Dissimilar soils: 8 percent

Soils of Minor Extent

Similar soils:
- Somewhat poorly drained soils on the gentler slopes; in landscape positions below those of the Richview soil

Dissimilar soils:
- The poorly drained Cisne soils on flats; in positions below those of the Richview soil

Properties and Qualities of the Richview Soil

Parent material: Loess over drift
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate
Depth to restrictive feature: More than 80 inches
Available water capacity: About 10.6 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.5 to 3.5 percent
Shrink-swell potential: Moderate
Apparent seasonal high water table (depth, months): 1.5 to 4.0 feet, February through April
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and concrete
Surface runoff class: Low
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2e
Prime farmland category: Prime farmland
Hydric soil status: Not hydric

4C2—Richview silt loam, 5 to 10 percent slopes, eroded

Setting

Landform: Kames on till plains
Position on the landform: Shoulders and backslopes

Map Unit Composition

Richview and similar soils: 92 percent
Dissimilar soils: 8 percent

Soils of Minor Extent

Similar soils:
- Somewhat poorly drained soils on the gentler slopes; in landscape positions below those of the Richview soil

Dissimilar soils:
- The somewhat poorly drained Passport soils on side slopes; in landscape positions below those of the Richview soil

Properties and Qualities of the Richview Soil

Parent material: Loess over drift
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity: About 10.1 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.0 to 2.5 percent
Shrink-swell potential: Moderate
Apparent seasonal high water table (depth, months): 1.5 to 4.0 feet, February through April

Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: High
Hazard of corrosion: High for steel and concrete
Surface runoff class: Medium
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3e
Prime farmland category: Not prime farmland
Hydric soil status: Not hydric

Sharon Series

Taxonomic classification: Coarse-silty, mixed, active, acid, mesic Oxyaquic Udifluvents

Typical Pedon

Sharon silt loam, 0 to 2 percent slopes, frequently flooded, at an elevation of 447 feet above mean sea level; Williamson County, Illinois; about 265 feet south and 275 feet east of the northwest corner of sec. 15, T. 9 S., R. 4 E.; USGS Crab Orchard, Illinois, topographic quadrangle; lat. 37 degrees 44 minutes 43.5 seconds N. and long. 88 degrees 45 minutes 40.3 seconds W.; UTM Zone 16S, 0344834 Easting, 4179030 Northing; NAD 83:

Ap—0 to 18 cm (0 to 7 inches); brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak and moderate fine granular structure; friable; many fine roots; about 30 percent sand; very strongly acid; abrupt smooth boundary.

A1—18 to 25 cm (7 to 10 inches); brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak medium platy structure parting to weak fine granular; friable; many fine roots; slightly compact as a weak plowsole; about 10 percent sand; strongly acid; abrupt smooth boundary.

A2—25 to 64 cm (10 to 25 inches); brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak medium granular structure; friable; common fine roots; few wormcasts; about 10 percent sand; strongly acid; clear smooth boundary.

C1—64 to 84 cm (25 to 33 inches); brown (10YR 4/3) silt loam; massive; friable; few fine roots; common medium faint pale brown (10YR 6/3) masses of oxidized iron-manganese in the matrix; few wormcasts; few fine dark iron-manganese concretions throughout; about 15 percent sand; very strongly acid; clear smooth boundary.

C2—84 to 102 cm (33 to 40 inches); brown (10YR 5/3) silt loam; massive; friable; few fine roots; common medium faint light brownish gray (10YR 6/2) iron depletions in the matrix; few fine distinct yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; few fine dark iron-manganese concretions throughout; about 20 percent sand; very strongly acid; gradual smooth boundary.

C3—102 to 127 cm (40 to 50 inches); mixed brown (10YR 5/3), light brownish gray (10YR 6/2), light gray (10YR 7/2), and yellowish brown (10YR 5/6) silt loam; massive; friable; few fine roots; common fine dark iron-manganese concretions throughout; about 15 percent sand; very strongly acid; gradual smooth boundary.

C4—127 to 155 cm (50 to 61 inches); light gray (10YR 7/2) silt loam; massive; friable; common medium prominent strong brown (7.5YR 5/6) masses of oxidized iron in the matrix; common fine dark iron-manganese concretions throughout; about 15 percent sand; very strongly acid.

Range in Characteristics

Ap or A horizon:
Hue—10YR
Value—2 to 5
Chroma—3 or 4
Texture—silt loam
Content of rock fragments—none
Reaction—very strongly acid or strongly acid from a depth of 25 to 102 cm (10 to 40 inches)

C horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 7
Chroma—2 to 6
Texture—silt loam; thin strata of loam, sandy loam, loamy sand, or sand in some pedons
Content of rock fragments—none
Reaction—very strongly acid or strongly acid above a depth of 102 cm (40 inches); very strongly acid to neutral below this depth

3072A—Sharon silt loam, 0 to 2 percent slopes, frequently flooded

Setting

Landform: Natural levees on flood plains

Map Unit Composition

Sharon and similar soils: 90 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

Similar soils:
- Soils that have more sand in the subsoil
- Soils that have more clay in the subsoil
- Somewhat poorly drained soils in swales; in positions below those of the Sharon soil

Dissimilar soils:
- The well drained Hickory soils on steep slopes; in landscape positions above those of the Sharon soil

Properties and Qualities of the Sharon Soil

Parent material: Alluvium
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate
Depth to restrictive feature: More than 80 inches
Available water capacity: About 11.4 inches to a depth of 60 inches
Content of organic matter in the surface layer: 0.5 to 3.0 percent
Shrink-swell potential: Low

Apparent seasonal high water table (depth, months): 1.7 to 6.7 feet, February through April
Ponding: None
Frequency and most likely period of flooding: Frequent, November through June
Potential for frost action: High
Hazard of corrosion: Moderate for steel and high for concrete
Surface runoff class: Low
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3w
Prime farmland category: Prime farmland where protected from flooding or not frequently flooded during the growing season
Hydric soil status: Not hydric

Tamalco Series

Taxonomic classification: Fine, smectitic, mesic Typic Natrudalfs

Typical Pedon

Tamalco silt loam, 0 to 2 percent slopes, at an elevation of 530 feet above mean sea level; Marion County, Illinois; about 1,114 feet south and 93 feet west of the northeast corner of sec. 19, T. 2 N., R. 2 E.; USGS Centralia East, Illinois, topographic quadrangle; lat. 38 degrees 36 minutes 06.6 seconds N. and long. 89 degrees 00 minutes 50.5 seconds W.; UTM Zone 16S, 0324620 Easting, 4274517 Northing; NAD 83:

Ap—0 to 20 cm (0 to 8 inches); brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine and medium subangular blocky structure parting to weak very fine and fine granular; friable; many distinct very dark grayish brown (10YR 3/2) organic stains on faces of peds; common fine spherical iron-manganese nodules throughout; neutral; abrupt smooth boundary.
E—20 to 33 cm (8 to 13 inches); pale brown (10YR 6/3) silt loam; weak thin and medium platy structure; friable; common distinct very dark grayish brown (10YR 3/2) organic stains and few distinct brown (10YR 4/3) clay films on faces of peds; common fine and medium spherical iron-manganese nodules throughout; slightly acid; abrupt smooth boundary.
Bt1—33 to 43 cm (13 to 17 inches); strong brown (7.5YR 5/6) silty clay; moderate fine prismatic structure parting to moderate very fine and fine angular blocky; firm; few distinct dark grayish brown (10YR 4/2) and many distinct reddish brown (5YR 4/4) clay films on faces of peds; few fine and medium spherical iron-manganese nodules throughout; moderately acid; clear smooth boundary.
Bt2—43 to 64 cm (17 to 25 inches); yellowish brown (10YR 5/4) silty clay; weak medium prismatic and coarse angular blocky structure; firm; common distinct dark grayish brown (10YR 4/2) and many distinct brown (10YR 4/3) clay films on faces of peds; few fine and medium spherical iron-manganese nodules throughout; many fine distinct yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; slightly acid; abrupt smooth boundary.
Btn—64 to 89 cm (25 to 35 inches); brown (10YR 5/3) silty clay loam; weak medium and coarse prismatic structure; firm; common distinct dark grayish brown (10YR 4/2) and brown (10YR 4/3) clay films on faces of peds; few fine and medium

spherical iron-manganese nodules throughout; few fine distinct gray (10YR 6/1) iron depletions in the matrix; common fine distinct yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; neutral; clear smooth boundary.

Btng—89 to 104 cm (35 to 41 inches); light brownish gray (10YR 6/2) silt loam; weak medium and coarse prismatic structure; friable; few distinct dark grayish brown (10YR 4/2) and brown (10YR 4/3) clay films on faces of peds and on surfaces along pores; few fine and medium spherical iron-manganese nodules throughout; few fine and medium irregular manganese coatings; few fine faint gray (10YR 6/1) iron depletions in the matrix; common fine prominent yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; slightly effervescent; slightly alkaline; abrupt smooth boundary.

2BCng—104 to 178 cm (41 to 70 inches); stratified grayish brown (10YR 5/2) silty clay loam and light brownish gray (10YR 6/2) clay loam; moderate medium and coarse prismatic structure parting to moderate coarse angular blocky; firm; common distinct dark gray (10YR 4/1) clay films on faces of peds; few fine and medium spherical iron-manganese nodules throughout; common fine faint gray (10YR 6/1) iron depletions in the matrix; common fine prominent yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; about 2 percent gravel; slightly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the loess: More than 100 cm (40 inches)
Carbonates: Commonly in the natric horizon
Depth to the base of the natric horizon: More than 90 cm (36 inches)

Ap or A horizon:
Hue—10YR
Value—3 to 5
Chroma—2 or 3
Texture—silt loam
Content of rock fragments—none
Reaction—very strongly acid to neutral

E horizon:
Hue—10YR
Value—4 to 6
Chroma—2 or 3
Texture—silt loam
Content of rock fragments—none
Reaction—very strongly acid to neutral

Bt horizon:
Hue—5YR, 7.5YR, or 10YR
Value—4 or 5
Chroma—3 to 6
Texture—silty clay or silty clay loam
Content of rock fragments—none
Reaction—very strongly acid to neutral

Btn and/or Btng horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 4
Texture—silty clay loam or silt loam

Content of rock fragments—none
Reaction—neutral to moderately alkaline

2BC or 2C horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—2 to 6
Texture—silty clay loam, silt loam, loam, or clay loam
Content of rock fragments—0 to 6 percent
Reaction—slightly alkaline to strongly alkaline

581A—Tamalco silt loam, 0 to 2 percent slopes

Setting

Landform: Till plains
Position on the landform: Summits

Map Unit Composition

Tamalco and similar soils: 90 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

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

Dissimilar soils:
- The somewhat poorly drained Hoyleton and Darmstadt soils in landscape positions below those of the Tamalco soil

Properties and Qualities of the Tamalco Soil

Parent material: Loess over mixed loess and drift
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow or slow
Depth to restrictive feature: 6 to 18 inches to a natric horizon
Sodium adsorption ratio within a depth of 30 inches: 13 to 25
Available water capacity: About 9.5 inches to a depth of 60 inches
Content of organic matter in the surface layer: 0.5 to 2.0 percent
Shrink-swell potential: High
Apparent seasonal high water table (depth, months): 1.5 to 4.0 feet, February through April
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and concrete
Surface runoff class: Medium
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3s
Prime farmland category: Not prime farmland
Hydric soil status: Not hydric

533—Urban land

This map unit occurs as areas that are mostly covered by pavement and buildings. It is mainly in Centralia and Salem. Because of extensive land smoothing, areas of this map unit generally are nearly level or gently sloping.

Wakeland Series

Taxonomic classification: Coarse-silty, mixed, superactive, nonacid, mesic Aeric Fluvaquents

Typical Pedon

Wakeland silt loam, 0 to 2 percent slopes, frequently flooded, at an elevation of 475 feet above mean sea level; Jasper County, Illinois; about 1,188 feet south and 2,500 feet west of the northeast corner of sec. 15, T. 7 N., R. 14 W.; USGS Oblong North, Illinois, topographic quadrangle; lat. 39 degrees 03 minutes 01 second N. and long. 87 degrees 57 minutes 19.7 seconds W.; UTM Zone 16S, 0417321 Easting, 4322790 Northing; NAD 83:

Ap—0 to 23 cm (0 to 9 inches); brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; moderate medium granular structure; very friable; common fine and very fine roots; slightly acid; abrupt smooth boundary.

Cg—23 to 56 cm (9 to 22 inches); grayish brown (10YR 5/2) silt loam; weak fine granular structure; very friable; common very fine roots; few distinct dark yellowish brown (10YR 4/4) organic coatings on faces of peds; many medium faint brown (10YR 5/3) and common medium distinct yellowish brown (10YR 5/4) masses of oxidized iron-manganese and few fine prominent yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; slightly acid; clear smooth boundary.

C—56 to 112 cm (22 to 44 inches); brown (10YR 5/3) silt loam; weak fine granular structure; very friable; common very fine roots; many coarse faint grayish brown (10YR 5/2) iron depletions and few fine distinct yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; moderately acid; clear smooth boundary.

C´g—112 to 152 cm (44 to 60 inches); grayish brown (10YR 5/2) silt loam; massive; friable; few very fine roots; many medium faint brown (10YR 5/3) masses of oxidized iron-manganese and common fine prominent yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; moderately acid.

Range in Characteristics

Ap or A horizon:
Hue—10YR
Value—4 or 5
Chroma—2 to 4
Texture—silt loam
Content of rock fragments—none
Reaction—moderately acid to neutral

C and Cg horizons:
Hue—10YR or 2.5Y
Value—4 to 7
Chroma—1 to 6
Texture—silt loam; thin strata of coarser textures in some pedons
Content of rock fragments—none
Reaction—moderately acid to slightly alkaline

3333A—Wakeland silt loam, 0 to 2 percent slopes, frequently flooded

Setting

Landform: Narrow flood plains

Map Unit Composition

Wakeland and similar soils: 90 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

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

Dissimilar soils:
- The well drained Wirt soils in landscape positions above those of the Wakeland soil
- The poorly drained Birds soils in swales; in landscape positions below those of the Wakeland soil

Properties and Qualities of the Wakeland Soil

Parent material: Silty alluvium
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate
Depth to restrictive feature: More than 80 inches
Available water capacity: About 12.1 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Low
Apparent seasonal high water table (depth, months): 0.5 foot to 2.0 feet, January through May
Ponding: None
Frequency and most likely period of flooding: Frequent, November through June
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Low
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3w
Prime farmland category: Prime farmland where drained and either protected from flooding or not frequently flooded during the growing season
Hydric soil status: Not hydric

W—Water

This map unit includes rivers, streams, lakes, and ponds. These areas are covered with water in most years, at least during the period that is warm enough for plant growth. Most areas are covered throughout the year.

Wirt Series

Taxonomic classification: Coarse-loamy, mixed, superactive, mesic Dystric Fluventic Eutrudepts

Typical Pedon

Wirt silt loam, 0 to 2 percent slopes, frequently flooded, at an elevation of 574 feet above mean sea level; Coles County, Illinois; about 390 feet west and 540 feet south of the northeast corner of sec. 14, T. 11 N., R. 9 E.; USGS Charleston South, Illinois, topographic quadrangle; lat. 39 degrees 24 minutes 10.8 seconds N. and long. 88 degrees 09 minutes 36.6 seconds W.; UTM Zone 16S, 0400111 Easting, 4362143 Northing; NAD 83:

A—0 to 8 cm (0 to 3 inches); very dark grayish brown (10YR 3/2) silt loam, pale brown (10YR 6/3) dry; weak fine subangular blocky structure parting to moderate fine granular; friable; neutral; abrupt smooth boundary.

Bw1—8 to 58 cm (3 to 23 inches); brown (10YR 4/3) silt loam; weak fine and medium subangular blocky structure; friable; common distinct dark brown (10YR 3/3) organic coatings on faces of peds; neutral; clear smooth boundary.

Bw2—58 to 81 cm (23 to 32 inches); dark yellowish brown (10YR 4/4) loam; weak medium subangular blocky structure; firm; common distinct dark brown (10YR 3/3) organic coatings on faces of peds; neutral; clear smooth boundary.

C—81 to 152 cm (32 to 60 inches); brown (10YR 5/3) and dark yellowish brown (10YR 4/4), stratified loam, sandy loam, and silt loam; massive; friable; neutral.

Range in Characteristics

Depth to carbonates: More than 100 cm (40 inches)
Depth to the base of the cambic horizon: 60 to 120 cm (24 to 48 inches)

Ap or A horizon:
Hue—10YR
Value—2 to 5
Chroma—2 to 4
Texture—silt loam
Content of rock fragments—0 to 5 percent
Reaction—moderately acid to neutral

Bw horizon(s):
Hue—10YR
Value—3 to 5
Chroma—3 to 6
Texture—loam, silt loam, or fine sandy loam
Content of rock fragments—0 to 15 percent
Reaction—moderately acid to neutral

C horizon:
Hue—10YR
Value—3 to 5
Chroma—3 to 6
Texture—stratified sandy loam, loam, and silt loam; strata of sand and loamy sand below a depth of 40 inches in some pedons
Content of rock fragments—0 to 15 percent
Reaction—moderately acid to neutral

3226A—Wirt silt loam, 0 to 2 percent slopes, frequently flooded

Setting

Landform: Natural levees and narrow flood plains

Map Unit Composition

Wirt and similar soils: 90 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

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

Dissimilar soils:
- The moderately well drained Sharon soils adjacent to the Wirt soil
- The somewhat poorly drained Holton soils in landscape positions below those of the Wirt soil

Properties and Qualities of the Wirt Soil

Parent material: Stratified, loamy alluvium
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity: About 8.6 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Low
Ponding: None
Frequency and most likely period of flooding: Frequent, November through June
Potential for frost action: Moderate
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Low
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3w
Prime farmland category: Prime farmland where protected from flooding or not frequently flooded during the growing season
Hydric soil status: Not hydric

Wynoose Series

Taxonomic classification: Fine, smectitic, mesic Typic Albaqualfs

Typical Pedon

Wynoose silt loam, 0 to 2 percent slopes, at an elevation of 455 feet above mean sea level; Wayne County, Illinois; about 967 feet west and 2,458 feet north of the southeast corner of sec. 10, T. 1 N., R. 8 E.; USGS Enterprise, Illinois, topographic quadrangle; lat. 38 degrees 31 minutes 57.4 seconds N. and long. 88 degrees 17 minutes 50.3 seconds W.; UTM Zone 16S, 0386926 Easting, 4265710 Northing; NAD 83:

Ap—0 to 18 cm (0 to 7 inches); dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; moderate fine granular structure; friable; common very fine roots throughout; common fine distinct brown (7.5YR 4/4) masses of oxidized iron-manganese in the matrix; few fine spherical extremely weakly cemented iron-manganese accumulations throughout; neutral; abrupt smooth boundary.

Eg1—18 to 36 cm (7 to 14 inches); light brownish gray (10YR 6/2) silt loam, white (2.5Y 8/1) dry; moderate medium platy structure; friable; few very fine roots throughout; common distinct light gray (10YR 7/2) (dry) clay depletions on faces of peds; common fine prominent strong brown (7.5YR 5/6) and yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; few fine spherical extremely weakly cemented iron-manganese accumulations throughout; strongly acid; clear smooth boundary.

Eg2—36 to 51 cm (14 to 20 inches); light brownish gray (10YR 6/2) silt loam, white (2.5Y 8/1) dry; moderate medium platy structure; friable; few very fine roots throughout; common distinct light gray (10YR 7/2) (dry) clay depletions on faces of peds; many fine prominent strong brown (7.5YR 5/6) masses of oxidized iron in the matrix; few fine spherical extremely weakly cemented iron-manganese accumulations throughout; few fine irregular iron-manganese concretions throughout; very strongly acid; abrupt smooth boundary.

Btg1—51 to 74 cm (20 to 29 inches); light brownish gray (10YR 6/2) silty clay; strong medium prismatic structure parting to strong medium angular blocky; firm; few very fine roots along faces of peds; many distinct gray (10YR 5/1) clay films and common distinct light gray (10YR 7/2) (dry) clay depletions on faces of peds; many fine and medium prominent strong brown (7.5YR 5/6) masses of oxidized iron in the matrix; common fine spherical extremely weakly cemented iron-manganese accumulations throughout; common fine and medium irregular iron-manganese concretions throughout; very strongly acid; clear smooth boundary.

Btg2—74 to 91 cm (29 to 36 inches); light brownish gray (10YR 6/2) silty clay; strong medium prismatic structure parting to strong medium angular blocky; firm; few very fine roots along faces of peds; common distinct gray (10YR 5/1) clay films and few distinct light gray (10YR 7/2) (dry) clay depletions on faces of peds; many fine and medium prominent strong brown (7.5YR 5/6) masses of oxidized iron in the matrix; few fine spherical extremely weakly cemented iron-manganese accumulations throughout; few fine irregular iron-manganese concretions throughout; very strongly acid; clear smooth boundary.

2Btg3—91 to 122 cm (36 to 48 inches); light brownish gray (10YR 6/2) silty clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots along faces of peds; few distinct grayish brown (10YR 5/2) clay films and few distinct light gray (10YR 7/2) (dry) clay depletions on faces of peds; common fine and medium prominent strong brown (7.5YR 5/6) masses of oxidized iron in the matrix; few fine spherical extremely weakly cemented iron-manganese accumulations throughout; few fine irregular iron-manganese concretions throughout; about 2 percent angular gravel by volume; strongly acid; clear smooth boundary.

2Btg4—122 to 168 cm (48 to 66 inches); gray (10YR 6/1) silty clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots along faces of peds; few distinct gray (10YR 5/1) clay films on faces of peds and few distinct dark grayish brown (10YR 4/2) clay films in root channels and pores; common fine and medium prominent strong brown (7.5YR

5/8) masses of oxidized iron in the matrix; few fine irregular iron-manganese concretions throughout; about 2 percent angular gravel by volume; strongly acid; clear smooth boundary.

3Btgb—168 to 203 cm (66 to 80 inches); gray (10YR 6/1) silty clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; very firm; common distinct gray (10YR 5/1) clay films on faces of peds and common prominent black (N 2.5/) manganese coatings on faces of peds; common fine and medium prominent strong brown (7.5YR 5/6 and 5/8) masses of oxidized iron in the matrix; common medium irregular iron-manganese concretions throughout; about 5 percent angular gravel by volume; moderately acid.

Range in Characteristics

Thickness of the loess: 76 to 140 cm (30 to 55 inches)
Depth to the base of the argillic horizon: More than 102 cm (40 inches)

Ap or A horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 or 2
Texture—silt loam
Content of rock fragments—none
Reaction—strongly acid to neutral

Eg horizon (where present):
Hue—10YR or 2.5Y
Value—5 to 7
Chroma—1 or 2
Texture—silt loam
Content of rock fragments—none
Reaction—extremely acid to neutral

Btg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silty clay loam or silty clay
Content of rock fragments—none
Reaction—extremely acid to moderately acid

2Btg or 2BCg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silt loam, silty clay loam, or clay loam
Content of rock fragments—0 to 10 percent
Reaction—extremely acid to moderately acid

3Agb and/or 3Btgb horizon:
Hue—7.5YR, 10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silt loam, silty clay loam, loam, or clay loam
Content of rock fragments—0 to 10 percent
Reaction—moderately acid to slightly alkaline

12A—Wynoose silt loam, 0 to 2 percent slopes

Setting

Landform: Till plains
Position on the landform: Summits

Map Unit Composition

Wynoose and similar soils: 90 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

Similar soils:
- Soils that have less clay in the subsoil
- Soils that have a darker surface layer

Dissimilar soils:
- The somewhat poorly drained Bluford soils on broad ridges and knolls; in landscape positions above those of the Wynoose soil

Properties and Qualities of the Wynoose Soil

Parent material: Loess over mixed loess and drift over paleo accretionary deposits
Drainage class: Poorly drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 13 to 30 inches to abrupt textural change
Available water capacity: About 10 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1.0 to 2.5 percent
Shrink-swell potential: High
Apparent seasonal high water table (depth, months): At the surface to 1 foot below the surface, January through May
Duration, depth, and most likely period of ponding: Brief, at the surface to 0.5 foot above the surface, January through May
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3w
Prime farmland category: Not prime farmland
Hydric soil status: Hydric

Zipp Series

Taxonomic classification: Fine, mixed, active, nonacid, mesic Typic Endoaquepts

Typical Pedon

Zipp silty clay loam, undrained, 0 to 2 percent slopes, frequently flooded, at an elevation of 385 feet above mean sea level; Wayne County, Illinois; about 800 feet south and 1,950 feet east of the northwest corner of sec. 21, T. 1 S., R. 9 E.; USGS

Albion NW, Illinois, topographic quadrangle; lat. 38 degrees 25 minutes 37.7 seconds N. and long. 88 degrees 12 minutes 53.3 seconds W.; UTM Zone 16S, 0393964 Easting, 4253909 Northing; NAD 83:

A—0 to 8 cm (0 to 3 inches); dark gray (10YR 4/1) silty clay loam; weak medium subangular blocky structure; firm; common fine roots; few distinct very dark gray (10YR 3/1) organic coatings on faces of peds; common medium prominent dark yellowish brown (10YR 4/6) masses of oxidized iron throughout; slightly acid; clear smooth boundary.

Bg1—8 to 36 cm (3 to 14 inches); gray (10YR 5/1) silty clay; weak medium subangular blocky structure; firm; few fine roots; few distinct dark gray (10YR 4/1) coatings on faces of peds; common medium distinct yellowish brown (10YR 5/4) masses of oxidized iron throughout; few fine iron-manganese concretions throughout; slightly acid; gradual wavy boundary.

Bg2—36 to 107 cm (14 to 42 inches); gray (10YR 5/1) silty clay; weak medium angular blocky structure; firm; few fine roots; few distinct dark gray (10YR 4/1) coatings on faces of peds; many coarse prominent brownish yellow (10YR 6/6) masses of oxidized iron throughout; few fine iron-manganese concretions throughout; slightly acid; gradual wavy boundary.

Cg—107 to 152 cm (42 to 60 inches); gray (10YR 5/1) silty clay; massive; firm; few distinct dark gray (10YR 4/1) organic coatings on faces of peds; common medium prominent yellowish brown (10YR 5/6) and common fine prominent strong brown (7.5YR 4/6) masses of oxidized iron throughout; few fine iron-manganese concretions throughout; neutral.

Range in Characteristics

Depth to the base of the cambic horizon: 75 to 150 cm (30 to 60 inches)

Ap or A horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—1 or 2
Texture—silty clay loam
Content of rock fragments—none
Reaction—moderately acid to neutral

Bg horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—4 to 6
Chroma—0 or 1
Texture—silty clay loam, silty clay, or clay
Content of rock fragments—none
Reaction—moderately acid to neutral

Cg or C horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—4 to 7
Chroma—0 to 6
Texture—silty clay loam or silty clay
Content of rock fragments—none
Reaction—neutral to moderately alkaline

1524A—Zipp silty clay loam, undrained, 0 to 2 percent slopes, frequently flooded

Setting

Landform: Depressions on flood plains

Map Unit Composition

Zipp and similar soils: 90 percent
Dissimilar soils: 10 percent

Soils of Minor Extent

Similar soils:
- Soils that are subject to ponding all year

Dissimilar soils:
- The well drained Hickory soils on steep slopes; in landscape positions above those of the Zipp soil

Properties and Qualities of the Zipp Soil

Parent material: Fine-textured lacustrine deposits
Drainage class: Very poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 5 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: High
Apparent seasonal high water table (depth, months): At the surface to 0.5 foot below the surface, November through May
Duration, depth, and most likely period of ponding: Long, at the surface to 0.5 foot above the surface, November through May
Frequency and most likely period of flooding: Frequent, November through June
Potential for frost action: High
Hazard of corrosion: Moderate for steel and concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Very low

Interpretive Groups

Land capability classification: 5w
Prime farmland category: Not prime farmland
Hydric soil status: Hydric

Use and Management of the Soils

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

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as forestland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and as wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

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

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

Interpretive Ratings

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

Rating Class Terms

Rating classes are expressed in the tables in terms that indicate the extent to which the soils are limited by all of the soil features that affect a specified use or in terms that indicate the potential of the soils for the use. Terms for limitation classes are *not limited, somewhat limited,* and *very limited*. Terms indicating the potential of the soils for a given use are *good, fair,* and *poor*.

Numerical Ratings

Numerical ratings in the tables indicate the relative severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use and the point at which the soil feature is not a limitation. The limitations appear in order from the most limiting to the least limiting. Thus, if more than one limitation is identified, the most severe limitation is listed first and the least severe one is listed last.

Crops and Pasture

General management needed for crops and pasture is suggested in this section. The estimated yields of the main crops and pasture plants are listed, the system of land capability classification used by the Natural Resources Conservation Service is explained, and prime farmland is described.

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

In 2002, approximately 215,000 acres in Marion County was used as cropland (USDA, National Agricultural Statistics Service, 2002). Data for the years 1998-2007 provide the following 10-year averages for the county: soybeans were grown on about 99,300 acres with a yield of 36 bushels per acre; corn was grown on about 64,800 acres with a yield of 123 bushels per acre; wheat was grown on about 22,100 acres with a yield of 57 bushels per acre; and sorghum was grown on about 7,920 acres with an average yield of 99 bushels per acre (USDA, National Agricultural Statistics Service Web site). Orchard, vegetable, and forage crops also are grown.

The soils in Marion County have excellent potential for continued crop production, particularly if the latest crop production technologies are applied. This soil survey can be used as a resource for applying the latest crop production technologies.

Limitations Affecting Cropland and Pastureland

The management concerns affecting the use of the detailed soil map units in the survey area for crops and pasture are shown in table 6.

Cropland

The main concerns affecting the management of nonirrigated cropland in Marion County are crusting, depth to bedrock, excess sodium, flooding, high pH, limited available water capacity, low pH, ponding, poor tilth, restricted permeability, root-restrictive layers, water erosion, and wetness.

Crusting occurs 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. Crusting can reduce the rate of water infiltration, increase the runoff rate, inhibit seedling emergence and proper growth, and reduce oxygen diffusion to seedlings. Generally, if the structure in the surface layer is weak, a crust forms on the surface during periods of intense rainfall. Bluford, Bonnie, Hoyleton, and Passport soils are examples of soils that have a low content of organic matter in the surface layer, which typically increases the risk of surface crusting. Practices that help to minimize surface crusting and improve tilth are those that protect the surface from the impact of raindrops and from flowing water. Incorporating green manure crops, manure, or crop residue into the soil and using a system of conservation tillage can help to prevent crusting by improving tilth.

Bedrock within a depth of 40 inches can increase the hazard of erosion and limit the effectiveness of subsurface drainage systems. The restricted rooting depth affects plant growth by limiting nutrients and available water. Gosport and Kell soils have bedrock within a depth of 40 inches.

Excess sodium restricts the availability and uptake of some plant nutrients. Excess sodium also causes clay in the soil to disperse, which in turn plugs pores and restricts permeability. Applications of gypsum may be needed to improve the fertility and permeability of soils for which excess sodium is a limitation, such as Darmstadt, Huey, and Tamalco soils. Returning crop residue to the soil and regularly adding manure or other organic material improve fertility and tilth in the surface layer.

Flooding occurs in unprotected areas along the major rivers and their tributaries (fig. 9). Dikes or diversions reduce the extent of crop damage caused by floodwater. Flooding is a hazard on more than 36,000 acres in Marion County, or about 10 percent of the total acreage. Most of the affected soils are frequently flooded by stream overflow. Flooding typically occurs in winter and spring. Damage to crops, particularly winter small grain crops, occurs in some years.

Bonnie, Belknap, and Wakeland soils are examples of soils that are subject to frequent flooding for brief periods, and Banlic soils are subject to occasional flooding for brief periods. In areas that are subject to flooding, planting crops that are adapted to a shorter growing season and wetter conditions reduces the risk of crop damage caused by floodwater. Controlling runoff from higher ground within the watershed can reduce the frequency and severity of flooding. Changing land use from cropland to pasture or forestland can also minimize the economic effects of damage caused by flooding.

High pH can create plant toxicity or reduce the availability of plant nutrients, either of which can affect the health and vigor of the plants. Darmstadt, Huey, and Tamalco soils are examples of soils that have high pH in one or more layers in the upper 40 inches. Incorporating green manure crops, manure, or crop residue into the soil,

Figure 9.—Flooding can delay planting and damage crops in areas of Birds soils.

applying a system of conservation tillage, applying a nutrient management system that includes additions of trace elements, and using conservation cropping systems can help to overcome this limitation. Crops that are tolerant of high pH, such as oats and barley, should be selected for planting in areas where high pH is a concern.

Limited available water capacity can result in droughtiness during periods of low rainfall. Some Kell soils have a limited available water capacity. Applying supplemental irrigation or planting crops that are tolerant of droughtiness, such as wheat, rye, oats, barley, alfalfa, and pasture grasses, can help to overcome this limitation.

Low pH can create toxicity or reduce the availability of nutrients, either of which can affect the health and vigor of the plants. Applications of lime can help to overcome this limitation. The form of lime and the timing, amount, and method of application should be based on the results of soil testing and on the type of crop to be grown. Benefits of liming include nutritive calcium and magnesium; neutralization of toxic compounds; retardation of plant diseases; increased availability of plant nutrients; and encouragement of micro-organism activity that is favorable to plants. Examples of soils with low pH are Kell and Wynoose soils.

Ponding inhibits aeration and increases nutrient losses. Soils affected by ponding in the survey area include Bonnie, Cisne, Newberry, and Wynoose soils. Land grading helps to control ponding. Surface ditches and surface inlet tile also help to remove excess water if suitable outlets are available. Management of drainage in conformance with regulations influencing wetlands may require special permits and extra planning.

Poor tilth can be inherent or may be caused by excessive tillage. Soils with poor tilth generally have a surface layer that is sticky when wet and hard and cloddy when dry. Because such soils can be tilled within only a narrow range in moisture content, seedbed preparation is difficult. If the timing is not right, the resultant clods can affect seed-to-soil contact. Poor tilth inhibits seedling germination and emergence, increases the rate of runoff and the hazard of erosion, and reduces the rate of water infiltration. Soils with good tilth are granular and porous and have a high content of organic matter in the surface layer. Soils that have poor tilth generally have more clay, a lower content of organic matter, and weaker soil structure in the surface layer. Plumfield soils and the severely eroded Atlas and Hickory soils have poor tilth. If these soils are plowed when too wet, they can become cloddy. Practices that improve soil tilth are those that protect the surface from the impact of raindrops and from flowing water. Incorporating green manure crops, manure, or crop residue into the soil and using a system of conservation tillage can improve tilth. Surface cloddiness can be controlled by avoiding tillage when the soil is too wet or by using no-till farming practices.

Restricted permeability interferes with internal soil drainage and aeration. Water-logging, denitrification, compaction, delayed planting, and a higher rate of surface runoff are some common effects of restricted permeability in areas used as cropland. Bluford, Bonnie, Cisne, Hoyleton, and Wynoose soils have restricted permeability; drainage is required for optimum crop yields in areas of these soils. A system of surface ditches composed of mains and laterals is the most common drainage method used. Tile drainage is less effective than surface drainage in these areas unless the tiles are closely spaced. Conservation tillage or no-till farming and crop residue management can help to minimize compaction and reduce the surface runoff rate.

Root-restrictive layers include dense material, natric horizons, bedrock, and fragipans. Such layers can increase the hazard of erosion and can affect plant growth by limiting nutrients and the available water capacity. Examples of soils with root-restrictive layers are Ava and Plumfield soils, which have a fragipan, and Darmstadt, Huey, and Tamalco soils, which have a natric horizon. A combination of conservation measures, including using special tillage practices, incorporating organic material into the soil, and selecting proper crop varieties, can help to overcome this limitation.

Water erosion reduces the stability of soil aggregates and thus reduces the rate of water infiltration and increases the rate of surface runoff (Brady, 1984). Soils that have long or steep slopes are susceptible to water erosion. Sheet and rill erosion is a hazard in areas where slopes are long or are subject to concentrated flow. Excessive runoff can reduce the quality of surface water through sedimentation and contamination by agricultural chemicals attached to soil particles in the sediment that enters streams, rivers, water impoundments, and road ditches. Many of the soils in Marion County are subject to water erosion, including Atlas, Hickory, Passport, and Plumfield soils. Erosion can be controlled by a conservation tillage system that leaves crop residue on the surface after planting or by a cropping system that includes rotations of grasses and legumes. On soils that have long, uniform slopes, contour farming and/or terraces in combination with a conservation tillage system can help to control erosion. Management measures that help to control water erosion can also reduce sedimentation and improve the quality of water available for rural, municipal, and recreational uses and for fish and wildlife.

Wetness is a management concern on about 80 percent of the acreage in Marion County. Some soils are naturally so wet that the production of crops generally is not possible unless a drainage system is installed. The poorly drained Bonnie, Cisne, Huey, Newberry, and Wynoose soils are examples of soils that are subject to wetness. Seasonal wetness in areas of somewhat poorly drained soils, such as Belknap, Bluford, and Hoyleton soils, can delay planting in some years. Most of the soils needing drainage have already been drained by surface ditches or tile. The maintenance or replacement of drainage systems is needed for maximum efficiency. Subsurface drains can lower the seasonal high water table if suitable outlets are available. In soils that have a high content of clay and restricted permeability, subsurface drainage is not practical. In these soils, surface ditches are used to reduce the wetness. Management of drainage in conformance with regulations influencing wetlands may require special permits and extra planning.

Pastureland

Growing legumes, cool-season grasses, and warm-season grasses that are suited to the soils and climate of the area helps to maintain a productive stand of pasture or hay. Suitable pasture and hay plants include several legumes, cool-season grasses, and native warm-season grasses. Alfalfa, red clover, alsike clover, and ladino clover are legumes commonly grown in the county. Alfalfa is best suited to well drained soils, such as Hickory, Kell, and Parke soils, and to moderately well drained soils, such as Ava and Richview soils. Alfalfa is also suited to some of the somewhat poorly drained soils, such as Hoyleton and Passport soils. Other legumes, such as alsike clover, red clover, and ladino clover, are more tolerant of wetter conditions. These legumes are best suited to poorly drained soils, such as Bonnie, Cisne, Racoon, and Wynoose soils, and to somewhat poorly drained soils, such as Atlas, Belknap, Bluford, and Creal soils.

Cool-season grasses commonly grown in the county include smooth bromegrass, orchardgrass, and tall fescue. These grasses can be used alone or in mixtures with legumes. Native warm-season grasses, such as indiangrass, little bluestem, and switchgrass, grow very well in the summer. They require different management techniques from those used for cool-season grasses.

Proper grazing is essential for the production of high-quality forage, stand survival, and erosion control. It helps plants to maintain sufficient and generally vigorous top growth during the growing season. Brush control is essential in many areas, and weed control is generally needed. Using rotation grazing, deferring grazing when the soil is wet, and applying lime and fertilizers as needed also are important management practices.

The main concerns affecting the management of pastureland in Marion County are depth to bedrock, equipment limitations, excess sodium, flooding, frost heave, high pH, limited available water capacity, low fertility, low pH, ponding, poor tilth, root-restrictive layers, water erosion, and wetness.

Bedrock within a depth of 40 inches can increase the hazard of erosion and limit the effectiveness of drainage systems. Bedrock affects plant growth by limiting nutrients and the available water capacity. Gosport and Kell soils have bedrock within a depth of 40 inches.

Equipment limitations make fertilization, harvest, pasture renovation, and seedbed preparation difficult or costly. The use of equipment is limited in moderately steep and steep areas of Hickory, Gosport, and Kell soils.

Excess sodium restricts the availability and uptake of some plant nutrients. Excess sodium also causes clay in the soil to disperse, which in turn plugs pores and restricts permeability. Applications of gypsum may be needed to improve the fertility and permeability of soils for which excess sodium is a limitation, such as Darmstadt, Huey, and Tamalco soils. Regularly adding manure or other organic material to the soil can improve fertility and tilth in the surface layer.

Flooding occurs in unprotected areas along the major rivers and their tributaries. Surface drainage ditches help to remove floodwater where suitable outlets are available. Flooding may damage pasture plants in some years. Banlic, Belknap, Birds, Bonnie, Holton, Orion, Sharon, Wakeland, Wirt, and Zipp soils are examples of soils that are subject to flooding. Selecting forage and hay varieties adapted to a shorter growing season and wetter conditions also reduces the extent of flood damage. Dikes and diversions can help to minimize the extent of flood damage. Restricted use during wet periods helps to keep the pasture in good condition. Management of drainage in conformance with regulations influencing wetlands may require special permits and extra planning.

Frost heave occurs in soils when ice lenses or bands develop into or push an ice wedge between layers of soil near the surface. The ice wedges heave the overlying soil layer upward, snapping the roots. Soils that have textures low in sand have small pores that hold water and enable ice lenses to form. Cisne, Newberry, Racoon, and Wynoose soils are examples of soils that are susceptible to frost heave. Selecting adapted forage and hay varieties helps to minimize the effects of frost heave. Timely rotation of grazing maintains a vegetative cover on the surface, which insulates the soil and thus reduces the effects of frost heave. In winter, leaving stubble 4 to 6 inches high helps to prevent frost heave. Using grass-legume mixtures can also help to prevent frost heave.

High pH can create plant toxicity or reduce the availability of plant nutrients, either of which can affect the health and vigor of the plants. Darmstadt, Huey, and Tamalco soils are examples of soils that have a high pH in one or more layers in the upper 40 inches. This limitation can be overcome by incorporating green manure crops, manure, or crop residue into the soil; applying a system of conservation tillage; applying a nutrient management system, including additions of trace elements; and using conservation cropping systems. Selecting crops that are tolerant of high pH, such as oats and barley, can also help to overcome this limitation.

Limited available water capacity can result in droughtiness during periods of low rainfall. Applying supplemental irrigation or planting crops that are tolerant of droughtiness, such as big bluestem, smooth brome, red fescue, alfalfa, and Kentucky bluegrass, can help to overcome this limitation. Some Kell soils have a limited available water capacity.

Low fertility is associated with a low content of organic matter in the surface layer and a low cation-exchange capacity. These characteristics may result in a limited capacity of the soil to retain nutrients for plant use. The severely eroded Atlas, Hickory, and Passport soils are examples of soils that have low fertility. Frequent applications of small amounts of fertilizer help to prevent excessive loss of plant nutrients through leaching. Using legumes as part of a seeding mixture can provide nitrogen to the grass varieties. Timely deferment of grazing helps to maintain adequate surface cover and the content of organic matter, which is a source of nutrients in the soil.

Low pH can create toxicity or reduce the availability of nutrients, either of which can affect the health and vigor of the plants. With few exceptions, almost all of the soils in Marion County have a pH less than or equal to 5.5 in one or more layers within a depth of 40 inches. Selecting adapted forage and hay varieties and applying lime according to the results of soil tests can help to overcome this limitation. Selecting species that are tolerant of acidic conditions, such as red clover, alsike clover, redtop, big bluestem, smooth brome, orchardgrass, red fescue, tall fescue, timothy, switchgrass, Kentucky bluegrass, and crimson clover, can improve the quantity and quality of livestock forage.

Ponding affects aeration and increases nutrient losses. Some soils affected by ponding in the survey area Bonnie, Cisne, Racoon, Wynoose, and Zipp soils. Land grading helps to control ponding. Surface ditches and surface inlet tile also help to remove excess water if suitable outlets are available. Management of drainage in conformance with regulations influencing wetlands may require special permits and extra planning. Selecting forage and hay varieties adapted to wet conditions can improve forage production. Restricted use during wet periods helps to keep the pasture in good condition.

Poor tilth in pasture or hayland can be inherent or may be caused by erosion or excessive tillage. Soils with poor tilth generally have a surface layer that is sticky when wet and hard and cloddy when dry. Because these soils can be tilled within only a narrow range in moisture content, seedbed preparation is difficult. If the timing is not right, the resultant clods can affect seed-to-soil contact. Poor tilth inhibits seedling germination and emergence, increases runoff and erosion, and reduces the rate of water infiltration. Soils with good tilth are granular and porous and have a high content of organic matter in the surface layer. Soils with poor tilth generally have more clay, a lower content of organic matter, and weaker soil structure in the surface layer. Plumfield soils and the severely eroded Atlas and Hickory soils have poor tilth. If these soils are tilled when too wet, they can become cloddy. Practices that improve soil tilth are those that protect the surface from the impact of raindrops and from flowing water. Surface cloddiness can be controlled by avoiding tillage when the soil is too wet or using no-till planting methods and by using a planned grazing system in areas of pastureland.

Root-restrictive layers include dense material, natric horizons, bedrock, or fragipans. Such layers can increase the hazard of erosion and limit the effectiveness of drainage systems. Root-restrictive layers affect plant growth by limiting available nutrients and the available water capacity. Examples of soils with root-restrictive layers are Ava and Plumfield soils, which have a fragipan, and Darmstadt, Huey, and Tamalco soils, which have a natric horizon. A combination of conservation measures, including special tillage practices, incorporating organic material into the soil, and selecting adapted forage and hay varieties, can help to overcome this limitation.

Water erosion reduces the productivity of the soil. It also results in sediments, livestock manure, and added nutrients entering streams, rivers, water impoundments, and road ditches. Soils with long or steep slopes are susceptible to water erosion. Many of the soils in Marion County are subject to water erosion, including Ava, Bluford, Hickory, Passport, and Plumfield soils. Using a system of rotation grazing prevents overgrazing and thus prevents surface compaction and excessive runoff and helps to control erosion. Tilling on the contour, using a no-till system of seeding, and selecting adapted forage and hay varieties also help to control erosion.

Wetness is a management concern on about 80 percent of the acreage in Marion County. Some soils are naturally so wet that the production of crops generally is not possible unless a drainage system is installed. The poorly drained Bonnie, Cisne, Huey, Newberry, and Wynoose soils are examples of soils that are subject to wetness. Most of the soils needing drainage are already drained by surface ditches or tile. The maintenance or replacement of drainage systems is necessary for maximum efficiency. Subsurface drains can lower the seasonal high water table if suitable outlets are available. In soils that have a high clay content and restricted permeability, subsurface drainage is not practical. In these soils, surface ditches are used to reduce the wetness. Management of drainage in conformance with regulations influencing wetlands may require special permits and extra planning. In undrained areas, grasses and forbs, such as switchgrass, alsike clover, and redtop, should grow well.

Erosion Control

Tony Antonacci, district conservationist, Natural Resources Conservation Service, helped prepare this section.

A survey of the county in 2006 found that erosion rates on 20 percent of the cropland were greater than what is considered tolerable (Illinois Department of Agriculture, 2006). Tolerable erosion rates, which are commonly referred to as “T” values (tons per acre per year), will not affect long-term productivity of the soil. Sheet and rill erosion by water is the most significant type of erosion in the county.

Classic gully erosion and ephemeral gully erosion are other significant types of erosion. Both classic gully erosion and ephemeral gully erosion are caused by the concentrated flow of water, which removes large amounts of soil from relatively small areas. Classic gullies are well defined, permanent, incised drainageways that cannot be crossed by ordinary farming operations. Ephemeral gully erosion, which is sometimes called mega-rill erosion, is similar to classic gully erosion except that the ephemeral gullies are not permanently incised. Ordinary farming operations can be used to remove ephemeral gullies; without treatment, however, these erosion features usually reappear after the next significant rainfall runoff event.

Erosion reduces productivity as the surface layer is removed and part of the subsoil becomes incorporated into the plow layer. Valuable plant nutrients also are lost along with the surface layer. In addition, soil tilth deteriorates as the more clayey subsoil is mixed with the plow layer. Erosion also reduces the rate at which water enters or infiltrates the soil. When infiltration rates are reduced, runoff rates increase and additional damage occurs downstream. The most common downstream damage occurs in the form of flooding, streambank erosion, sedimentation, and nutrient loading in streams, wetlands, and water bodies.

The damaging effects of soil erosion can be greatly reduced through the application of conservation practices. In Marion County the most common measures are conservation cropping sequences, conservation tillage, critical-area seeding, field borders, filter strips, grade-stabilization structures, grassed waterways, ponds, water- and sediment-control basins, tree planting, and the conversion of marginal cropland to properly managed grassland or wildlife habitat.

A cropping sequence can include row crops, small grain, and hay or pasture. In the more gently sloping areas, row crops generally can be grown intensively without excessive erosion. In the steeper areas, a conservation cropping system is needed to control erosion. A conservation cropping system includes fewer years of row crops and more years of small grain and meadow crops.

Conservation tillage leaves a protective cover of crop residue on at least 30 percent of the surface after planting. As the amount of crop residue left on the surface increases, the hazards of soil blowing and sheet and rill erosion decrease.

A survey conducted in 2006 found that conservation tillage methods were used in planting about 66 percent of the soybeans in the county (fig. 10). Conventional tillage, however, is still the dominant tillage practice for planting corn. Only about 19 percent of the corn was planted using conservation tillage methods (Illinois Department of Agriculture, 2006).

Conservation tillage is a cost-effective conservation measure. In row-cropped areas where the rate of sheet and rill erosion is high, conservation tillage should be an integral part of the resource management system.

Critical-area seeding is necessary where sod-protecting vegetation is needed to prevent extremely high erosion rates. This practice is common on classic gullies, road embankments, pond dams, and other erodible sites. Typically, the area is shaped and grass is seeded either with or without legumes.

Field borders are grass strips planted along the edges of fields. In Marion County, these grass strips serve as a buffer between areas of cropland and forestland. Areas immediately adjacent to forestland are typically less productive cropland because of shading and competition for moisture. Field borders can also be used as turning and travel lanes and may provide beneficial cover for wildlife.

Filter strips are strips of grass that filter runoff and remove contaminants before they reach water bodies, such as streams, lakes, and ponds. In other cases, filter strips are used in conjunction with other practices to treat the effluent from livestock facilities. In Marion County, contaminants commonly removed by filter strips are soil or sediment, nutrients, pesticides, and organics from livestock waste.

Figure 10.—Crop residue left on the surface of a soybean field as a result of conservation tillage in an area of Hoyleton soils.

Grade-stabilization structures help to maintain the gradient where a sudden drop in elevation occurs, such as in grassed waterways, diversions, or other surface channels. Construction materials may include rock, concrete, geo-textiles, piping, or earth fill. These structures help to prevent gullying in areas where grassed waterways terminate at an outlet.

Grassed waterways transport concentrated water safely from a cropped field to a stable outlet (fig. 11). They commonly are used in conjunction with grade-stabilization structures.

Ponds help to prevent the formation of gullies. Also, they can be a valuable water supply for people, livestock, and wildlife and can provide opportunities for recreation.

Water- and sediment-control basins, or “wascobs,” are dams constructed across drainageways. These dams are used to trap and remove excess water through underground field tile. Wascobs serve as sediment traps and reduce the concentration of water.

Tree planting is used to establish a tree crop and wildlife habitat in areas of marginal cropland. In Marion County, marginal cropland includes areas of severely eroded upland soils and frequently flooded soils on bottom land. The most desirable trees for harvest are ash, hickory, oak, pecan, and walnut.

Marginal cropland with high potential for erosion can be converted to permanent grassland. Grassland areas can be harvested as pasture or hay or managed for wildlife. These uses are more productive and less damaging than crop production. Hayland and pasture require proper management, such as applications of fertilizer, proper stocking rates, good harvesting methods, and renovation measures. Wildlife benefits are influenced by species selection and management practices.

Figure 11.—A grassed waterway protects this area of Passport and Grantfork soils from gully erosion.

Drainage Systems

Tony Antonacci, district conservationist, Natural Resources Conservation Service, helped prepare this section.

The very poorly drained to somewhat poorly drained soils in the county require artificial drainage for most land uses. The seasonal high water table or ponding can damage crops or delay planting. Most areas in the county can be used for corn, soybeans, or small grain because a surface drainage system has been installed. Measures that maintain the drainage system are needed periodically. Manipulating drainage improves farmability and the timeliness of field operations and reduces crop losses and crop stress.

A system of surface ditches that includes mains and laterals is the most common drainage method in areas of the moderately slowly permeable to very slowly permeable soils in the uplands. Bluford, Cisne, Newberry, and Wynoose soils are examples.

If suitable outlets are available, subsurface tile drainage systems function satisfactorily in some areas of soils on bottom land, such as Belknap, Bonnie, and Holton soils. The tiles should be more closely spaced in the more slowly permeable soils than in the more rapidly permeable soils.

Further information about drainage systems is provided in the Technical Guide, which is available in local offices of the Natural Resources Conservation Service.

Yields per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 7. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of map units in the survey area also is shown in the table.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations also are considered (Olson and Lang, 2000; Olson and others, 2000).

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 grass-legume pasture also are shown in table 7. Pasture yields are expressed in terms of animal unit months. An animal unit month (AUM) is the amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

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

Crops other than those shown in table 7 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 the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

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

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit (USDA, 1961).

Capability classes, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have slight limitations that restrict their use.

Class 2 soils have moderate limitations that restrict the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that restrict the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that restrict the choice of plants or that require very careful management, or both.

Class 5 soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.

Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, 2e. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c,* used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class 1 there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w, s,* or *c* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, forestland, or wildlife habitat.

Capability units are soil groups within a subclass. The soils in a capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, 2e-4 and 3e-6. These units are not given in all soil surveys.

The capability classification of the soils in this survey area is given in the section “Soil Series and Detailed Soil Map Units” and in table 7.

Prime Farmland

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

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

A recent trend in land use in some parts of Illinois has been the conversion of some prime farmland to urban and industrial uses. The loss of prime farmland to other uses puts pressure on lands that generally are less productive than prime farmland.

About 172,500 acres, or nearly 47 percent of the total acreage in Marion County, meets the requirements for prime farmland. This land is generally used for cultivated crops, mainly corn and soybeans. Prime farmland is located throughout the county.

The map units in the survey area that are considered prime farmland are listed in table 8. This list does not constitute a recommendation for a particular land use. On some soils included in the list, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures. The extent of each listed map unit is shown in table 5. The location is shown on the detailed soil maps. Some of the soil qualities that affect use and management are described under the heading "Soil Series and Detailed Soil Map Units."

Hydric Soils

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 all 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, under natural conditions, 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, 2002). These criteria are used to identify map unit components that normally are 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, 2006) and in the “Soil Survey Manual” (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time 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 are specified in “Field Indicators of Hydric Soils in the United States” (Hurt and Vasilas, 2006).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. The 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.

Map units that are dominantly made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units dominantly made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform. Table 9 lists the map units that include hydric soils, either as major components or as soils of minor extent. The hydric soils listed in the table meet the definition of a hydric soil and 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 Vasilas, 2006).

The criteria for hydric soils are represented by codes in the table (for example, 2B3). Definitions for the codes are as follows:

1. All Histels except for Folistels, and Histosols except for Folists.
2. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Historthels great group, Histoturbels great group, Pachic subgroups, or Cumulic subgroups that:
   - A. are somewhat poorly drained and have a water table at the surface (0.0 feet) during the growing season, or
   - B. are poorly drained or very poorly drained and have either:
     - 1) a water table at the surface (0.0 feet) during the growing season if textures are coarse sand, sand, or fine sand in all layers within a depth of 20 inches, or
     - 2) a water table at a depth of 0.5 foot or less during the growing season if saturated hydraulic conductivity (Ksat) is equal to or greater than 6.0 in/hr in all layers within a depth of 20 inches, or
     - 3) a water table at a depth of 1.0 foot or less during the growing season if saturated hydraulic conductivity (Ksat) is less than 6.0 in/hr in any layer within a depth of 20 inches.

3. Soils that are frequently ponded for long or very long duration during the growing season.
4. Soils that are frequently flooded for long or very long duration during the growing season.

Windbreaks and Environmental Plantings

Windbreaks protect livestock, buildings, yards, fruit trees, gardens, and cropland from wind and snow; help to keep snow on fields; and provide food and cover for wildlife. 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.

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.

Table 10 shows the height that locally grown trees and shrubs are expected to reach in 20 years on soils in the survey area. The estimates in the 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 the local office of the Natural Resources Conservation Service or the Cooperative Extension Service or from a commercial nursery.

Forestland

When the first settlers arrived in the survey area, forests covered about 41 percent of the land (Iverson and others, 1989). Since then, about 49 percent of the trees have been cleared from the areas that are most suitable for cultivation. By 2000, only about 76,000 acres, or 21 percent of the total acreage, remained as forestland (Illinois Department of Agriculture Web site). Most of the forestland acres are privately owned. The most common trees in the uplands are white oak, black oak, northern red oak, shagbark hickory, white ash, green ash, sugar maple, silver maple, boxelder, black walnut, black cherry, and American elm. The most common trees on the flood plains are cottonwood, sycamore, willow, bur oak, pin oak, swamp white oak, hackberry, and silver maple.

The remaining forestland acres are predominantly in areas that are too steep, too wet, or too isolated for cultivation. Most of these areas are along the major creeks and rivers and their tributaries. If they are properly managed, the soils in these areas are generally well suited to growing high-quality trees.

The productivity of many of the forestland stands could be improved with proper management. Excluding livestock from the forestland, providing protection from fire, insects, and diseases, using proper logging methods, and applying proven silvicultural methods to enhance growth and regeneration are management practices that are commonly needed in these areas.

Table 11 can help woodland owners or forest managers plan the use of soils for wood crops. Only those soils commonly used for wood crops are listed.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a site index and as a volume number. The *site index* is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that forest managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability. More detailed information regarding site index is available in the “National Forestry Manual,” which is available in local offices of the Natural Resources Conservation Service or online at http://soils.usda.gov/technical/.

The *volume of wood fiber*, a number, is the yield likely to be produced by the most important tree species. This number, expressed as cubic feet per acre per year and calculated at the age of culmination of the mean annual increment (CMAI), indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

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

Recreation

The demand for recreational facilities is increasing throughout Marion County. Public lands available for recreation include the Stephen A. Forbes State Recreation Area (fig. 12), Raccoon Lake, and Lake Centralia. These areas are used for camping, hiking, bicycling, running, hunting, fishing, boating, swimming, picnicking, and sightseeing. Areas for the viewing of wildlife, including the endangered prairie chicken, are available along the Prairie Ridge State Natural Area. A few privately owned campgrounds and hunting lodges have been developed in the county. Other facilities in the county include playgrounds, athletic fields, picnic areas, golf courses, and swimming pools.

The potential for further recreational development is favorable throughout the county. The soils having the best potential for such development are in the uplands along the banks of the major creeks and rivers and their tributaries. These soils are in areas where the hilly terrain, wooded slopes, and numerous streams provide a variety of locations suited to recreational uses.

The soils of the survey area are rated in tables 12a and 12b according to limitations that affect their suitability for recreation. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the recreational uses. *Not limited* indicates that the soil

Figure 12.—The Stephen A. Forbes State Recreation Area provides opportunities for a variety of recreational activities.

has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

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

The information in tables 12a and 12b can be supplemented by other information in this survey, for example, interpretations for building site development, construction materials, sanitary facilities, and water management.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic (fig. 13). The ratings are based on the soil properties that affect the ease of developing camp areas and the performance of the areas after development. Slope, stoniness, and depth to bedrock or a cemented pan are the main concerns affecting the development of camp areas. The soil properties that affect the performance of the areas after development are those that influence trafficability and promote the growth of vegetation, especially in heavily used areas. For good trafficability, the surface of camp areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Picnic areas are subject to heavy foot traffic (fig. 14). Most vehicular traffic is confined to access roads and parking areas. The ratings are based on the soil properties that affect the ease of developing picnic areas and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of picnic areas. For good trafficability, the surface of picnic areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Playgrounds require soils that are nearly level, are free of stones, and can withstand intensive foot traffic (fig. 15). The ratings are based on the soil properties that affect the ease of developing playgrounds and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns

Figure 13.—Recreational vehicles at a campground in an area of Bluford soils.

Figure 14.—A picnic area overlooking Forbes Lake in an area of Bluford soils.

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

Paths and trails for hiking and horseback riding should require little or no slope modification through cutting and filling. The ratings are based on the soil properties that affect trafficability and erodibility. These properties are stoniness, depth to a water table, ponding, flooding, slope, and texture of the surface layer.

Off-road motorcycle trails require little or no site preparation. They are not covered with surfacing material or vegetation. Considerable compaction of the soil material is likely. The ratings are based on the soil properties that influence erodibility, trafficability, dustiness, and the ease of revegetation. These properties are stoniness, slope, depth to a water table, ponding, flooding, and texture of the surface layer.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer. The suitability of the soil for traps, tees, roughs, and greens is not considered in the ratings.

Figure 15.—Playground equipment in an area of Ava soils at Stephen A. Forbes State Recreation Area.

Wildlife Habitat

Marion County is in an area of transition from a broad, tall-grass prairie that contained wet meadows, marshes, and areas of open water to an area dominated by central hardwood forest habitat. This area has traditionally provided valuable nesting and stop-over habitat for migratory waterfowl and important habitat for other wetland and openland wildlife species. Forestland areas, especially those along creeks and on moderately steep to very steep landforms, provide habitat for turkey, songbirds, birds of prey, and many mammals, including deer, squirrel, rabbits, fox, and beaver.

As the county was settled, the conversion of land for agricultural use altered these natural communities and affected the wildlife species associated with them. Marion County is now a mosaic of urban development, cropland, pasture, areas of forestland, wetlands, and waterways that support wildlife species that have adapted to the human-altered landscape. These species include whitetail deer, fox, coyotes, doves, quail, squirrels, rabbits, and raccoons.

The largest area in Marion County managed primarily for wildlife habitat is the Prairie Ridge State Natural Area, which is managed by the Illinois Department of Natural Resources. This area has more than 1,200 acres, and its main objective is the development of a grassland ecosystem capable of maintaining viable populations of grassland species, including permanent resident and migratory species, with emphasis on threatened and endangered species (Illinois Department of Natural Resources Web site). The land is in scattered areas throughout the northeastern part of the county (fig. 16).

Other areas used as wildlife habitat are not necessarily set aside for this purpose. Wildlife habitat is commonly a secondary use in areas used for other purposes, such as farming. For example, the large areas of nearly level and gently sloping soils used for cultivated crops and pasture are also generally well suited to use as habitat for openland wildlife. Most areas in the county can be improved for wildlife habitat by providing needed food, cover, and water.

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

In table 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.

Figure 16.—The Prairie Ridge State Natural Area provides habitat for an abundance of wildlife species.

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

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture also are considerations. Examples of grasses and legumes are lovegrass, orchardgrass, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of wild herbaceous plants are bluestem, goldenrod, ragweed, wildrye, and Illinois bundleflower.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, hickory, sycamore, cottonwood, elm, sassafras, serviceberry, gray dogwood, flowering dogwood, hazelnut, sumac, and raspberry. The best choices for planting on soils rated *good* are native plants, such as hazelnut, gray dogwood, silky dogwood, oak, and hickory.

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

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, wildrice, saltgrass, cordgrass, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

Shallow water areas can often be included in the design of ponds and lakes by utilizing the naturally shallow end of the impoundment. Wetland areas can also be created by installing water control valves on field drainage tiles, allowing for flooding of fields at times not necessary for crop production, such as after fall harvest. Valves can be opened to drain fields for spring planting while allowing soil moisture to remain high enough for good productivity. Islands, wood duck boxes, and an even mix of open water and aquatic plants help to provide optimum wildlife habitat in permanent wetland areas for wildlife.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include bobwhite quail, meadowlark, field sparrow, cottontail, and red fox.

The habitat for openland wildlife can be improved by seeding roadsides, fence rows, and wildlife travel lanes to perennial plants and legumes, such as smooth bromegrass, timothy, redtop, bluegrass, alfalfa, red clover, ladino clover, and alsike clover. Grassy areas can be enhanced with perennial native prairie grasses, such as big bluestem, little bluestem, switchgrass, and indiangrass. Protecting nesting cover from fire, traffic, grazing, mowing, or other disturbance until after the nesting season also is important.

Warm-season grasses grow best if periodic prescribed burning is applied. Any existing woody cover should be protected from fire and grazing. Establishing hedgerows and windbreaks of trees and shrubs can provide a source of food and roosting areas. Brush piles can be built for cover along fence rows and in odd-shaped areas that are inconvenient for cultivation. Leaving crop residue on the surface after harvest and leaving waste grain in the fields can provide cover and food for wildlife throughout the winter. Also, parts of fields that are adjacent to areas of wildlife cover can be left unharvested.

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

Habitat for woodland wildlife can be improved by protecting native trees, shrubs, and prairie plants from grazing by livestock. Also, protecting the areas from uncontrolled fire helps to minimize the destruction of the leaf mulch and of desirable young trees, shrubs, and sprouts that provide food and cover. Establishing hedgerows, farm windbreaks, brush piles, food plots, and strips of grass or grass-legume mixtures can provide additional food and cover. Plantings for food and cover may be difficult to establish and maintain in the more sloping areas because of the hazard of erosion. Food plots of grain or seed crops should be established in the less sloping areas and should be planted on the contour. Leaving dead trees to provide den sites for raccoons, woodpeckers, opossums, and other cavity-dwelling species also improves the habitat.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas (fig. 17). Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, frogs, snakes, and turtles.

Measures that improve the habitat for wetland wildlife include delaying or limiting the cultivation and planting of commodity crops in the shallow depressions that are subject to ponding. Areas of smartweeds, bulrushes, burreeds, and barnyard grasses should be protected. Japanese millet, milo, and short corn varieties can be planted to provide food and cover. Blocking natural channels and manmade drainage systems can create shallow ponds and marshes. Pits dug in poorly drained or very poorly drained soils should be at least 30 feet in diameter and 2 to 3 feet deep. Such pits provide open water through the spring and early summer and thus encourage nesting by ducks. Wetland areas should be protected from grazing by livestock.

Figure 17.—This area of Zipp soils at Stephen A. Forbes State Recreation Area provides habitat for wetland wildlife.

Engineering

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

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

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

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

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about particle-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 7 feet of the surface, soil wetness, depth to a water table, ponding, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

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

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

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

Building Site Development

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. Tables 14a and 14b show the degree and kind of soil limitations that affect dwellings with and without basements, small commercial buildings, local roads and streets, shallow excavations, and lawns and landscaping.

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

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

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

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

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder (fig. 18). The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing.

Figure 18.—Roads maintained with chip and seal are common in Marion County. This road was constructed in an area of Hoyleton and Darmstadt soils.

Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

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

Sanitary Facilities

Tables 15a and 15b show the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, sanitary landfills, and daily cover for landfill. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation.

Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 60 inches is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Considered in the ratings are slope, permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, flooding, large stones, and content of organic matter.

Soil permeability is a critical property affecting the suitability for sewage lagoons. Most porous soils eventually become sealed when they are used as sites for sewage lagoons. Until sealing occurs, however, the hazard of pollution is severe. Soils that have a permeability rate of more than 2 inches per hour are too porous for the proper functioning of sewage lagoons. In these soils, seepage of the effluent can result in contamination of the ground water. Ground-water contamination is also a hazard if fractured bedrock is within a depth of 40 inches, if the water table is high enough to raise the level of sewage in the lagoon, or if floodwater overtops the lagoon.

A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor. If the lagoon is to be uniformly deep throughout, the slope must be gentle enough and the soil material must be thick enough over bedrock or a cemented pan to make land smoothing practical.

A *trench sanitary landfill* is an area where solid waste is placed in successive layers in an excavated trench. The waste is spread, compacted, and covered daily with a thin layer of soil excavated at the site. When the trench is full, a final cover of soil material at least 2 feet thick is placed over the landfill. The ratings in the table are based on the soil properties that affect the risk of pollution, the ease of excavation, trafficability, and revegetation. These properties include permeability, depth to bedrock or a cemented pan, depth to a water table, ponding, slope, flooding, texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, onsite investigation may be needed.

Hard, nonrippable bedrock, creviced bedrock, or highly permeable strata in or directly below the proposed trench bottom can affect the ease of excavation and the hazard of ground-water pollution. Slope affects construction of the trenches and the movement of surface water around the landfill. It also affects the construction and performance of roads in areas of the landfill.

Soil texture and consistence affect the ease with which the trench is dug and the ease with which the soil can be used as daily or final cover. They determine the workability of the soil when dry and when wet. Soils that are plastic and sticky when wet are difficult to excavate, grade, or compact and are difficult to place as a uniformly thick cover over a layer of refuse.

The soil material used as the final cover for a trench landfill should be suitable for plants. It should not have excess sodium or salts and should not be too acid. The surface layer generally has the best workability, the highest content of organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

In an *area sanitary landfill*, solid waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site. A final cover of soil material at least 2 feet thick is placed over the completed landfill. The ratings in the table are based on the soil properties that affect trafficability and the risk of pollution. These properties include flooding, permeability, depth to a water table, ponding, slope, and depth to bedrock or a cemented pan.

Flooding is a serious problem because it can result in pollution in areas downstream from the landfill. If permeability is too rapid or if fractured bedrock, a fractured cemented pan, or the water table is close to the surface, the leachate can contaminate the water supply. Slope is a consideration because of the extra grading required to maintain roads in the steeper areas of the landfill. Also, leachate may flow along the surface of the soils in the steeper areas and cause difficult seepage problems.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste. The ratings in the table also apply to the final cover for a landfill. They are based on the soil properties that affect workability, the ease of digging, and the ease of moving and spreading the material over the refuse daily during wet and dry periods. These properties include soil texture, depth to a water table, ponding, rock fragments, slope, depth to bedrock or a cemented pan, reaction, and content of salts, sodium, or lime.

Loamy or silty soils that are free of large stones and excess gravel are the best cover for a landfill. Clayey soils may be sticky and difficult to spread; sandy soils are subject to wind erosion.

Slope affects the ease of excavation and of moving the cover material. Also, it can influence runoff, erosion, and reclamation of the borrow area.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. It should not have excess sodium, salts, or lime and should not be too acid.

Construction Materials

Tables 16a and 16b give information about the soils as potential sources of reclamation material, roadfill, topsoil, gravel, and sand. Normal compaction, minor processing, and other standard construction practices are assumed.

Table 16a

In this table, the rating class terms are *good, fair,* and *poor*. The features that limit the soils as sources of reclamation material, roadfill, and topsoil are specified in the table. The numerical ratings given after the specified features indicate the degree to which the features limit the soils as sources of these materials. The lower the number, the greater the limitation.

Reclamation material is used in areas that have been drastically disturbed by surface mining or similar activities. When these areas are reclaimed, layers of soil material or unconsolidated geological material, or both, are replaced in a vertical sequence. The reconstructed soil favors plant growth. The ratings in the table do not apply to quarries and other mined areas that require an offsite source of reconstruction material. The ratings are based on the soil properties that affect erosion and stability of the surface and the productive potential of the reconstructed soil. These properties include the content of sodium, salts, and calcium carbonate; reaction; available water capacity; erodibility; texture; content of rock fragments; and content of organic matter and other features that affect fertility.

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

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

The ratings are based on the amount of suitable material and on soil properties that affect the ease of excavation and the performance of the material after it is in place. The thickness of the suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the AASHTO classification of the soil) and linear extensibility (shrink-swell potential).

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area. The ratings are based on the soil properties that affect plant growth; the ease of excavating, loading, and spreading the material; and reclamation of the borrow area. Toxic substances, soil reaction, and the properties that are inferred from soil texture, such as available water capacity and fertility, affect plant growth. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, depth to bedrock or a cemented pan, and toxic material.

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

Table 16b

Gravel and *sand* 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 this table, only the likelihood of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material. The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the bottom layer of the soil contains sand or gravel, the soil is considered a likely source regardless of thickness. The assumption is that the sand or gravel layer below the depth of observation exceeds the minimum thickness.

The soils are rated *good, fair,* or *poor* as potential sources of sand and gravel. A rating of *good* or *fair* means that the source material is likely to be in or below the soil. The bottom layer and the thickest layer of the soils are assigned numerical ratings. These ratings indicate the likelihood that the layer is a source of sand or gravel. The number 0.00 indicates that the layer is a poor source. The number 1.00 indicates that the layer is a good source. A number between 0.00 and 1.00 indicates the degree to which the layer is a likely source.

Water Management

Tables 17a and 17b give 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; aquifer-fed excavated ponds; grassed waterways and surface drains; terraces and diversions; and tile drains and underground outlets. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Table 17a

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. Embankments that have zoned construction (core and shell) are not considered. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A 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.

Table 17b

Grassed waterways and surface drains 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 affect the construction of grassed waterways. A hazard of wind erosion, a low available water capacity, restricted rooting depth, toxic substances such as salts and sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

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 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.

Tile drains and underground outlets are used in some areas to remove excess subsurface and surface water from the soil. The ratings in the table apply to undisturbed soils that commonly have a seasonal high water table within a depth of about 3.5 feet. Current land use is not considered in the ratings. Depth to bedrock, a dense layer, or a cemented pan, the content of large stones, and the content of clay influence the ease of digging, filling, and compacting. A seasonal high water table, ponding, and flooding may restrict the period when excavations can be made. The slope influences the use of machinery. Soil texture and depth to the water table influence the resistance to sloughing. Subsidence of organic layers influences grade and stability of tile drains. Limitations affecting areas where the tile line passes through soils in which the water table is generally below a depth of 3.5 feet are provided in the table that includes the column “shallow excavations,” which is described under the heading “Building Site Development.”

Soil Properties

Data relating to soil properties are collected during the course of the soil survey.

Soil properties are ascertained by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine particle-size distribution, plasticity, and compaction characteristics. These results are reported in table 23.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties are shown in tables. They include engineering index properties, physical and chemical properties, and pertinent soil and water features.

Engineering Index Properties

Table 18 gives the engineering classifications and the range of index properties for the layers of each soil in the survey area.

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter (fig. 19). "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (ASTM, 2005) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2004).

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

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1

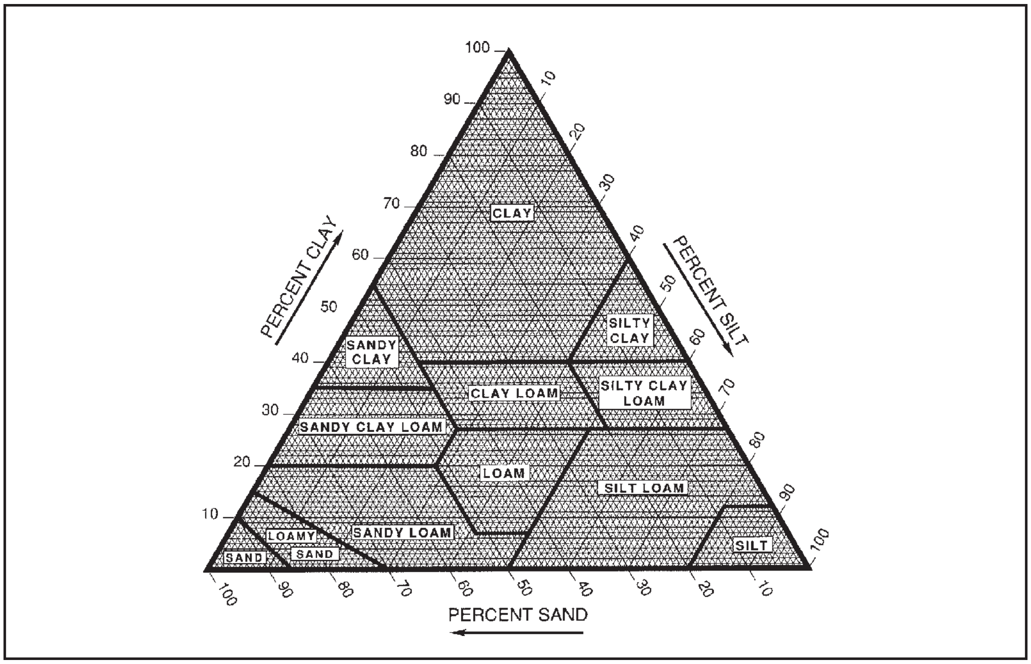


Figure 19.—Percentages of clay, silt, and sand in the basic USDA soil textural classes.

through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

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

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

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

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

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

Physical Properties

Table 19 shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

Sand as a soil separate consists of mineral soil particles that are 0.05 millimeter to 2 millimeters in diameter. In the table, the estimated sand content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Silt as a soil separate consists of mineral soil particles that are 0.002 to 0.05 millimeter in diameter. In the table, the estimated silt content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

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

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

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

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at $^1/_3$- or $^1/_{10}$-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability (Ksat) refers to the ability of a soil to transmit water or air. The term “permeability,” as used in soil surveys, indicates saturated hydraulic conductivity (Ksat). The estimates in the table indicate the rate of water movement, in inches per hour, when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

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

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at $^{1}/_{3}$- or $^{1}/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. Volume change is influenced by the amount and type of clay minerals in the soil.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 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 by returning crop residue to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops.

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 six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and permeability. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

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

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are described in the “National Soil Survey Handbook” (http://soils.usda.gov/technical/).

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

Chemical Properties

Table 20 shows estimates of some chemical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Cation-exchange capacity is the total amount of extractable bases that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. The ability to retain cations reduces the hazard of ground-water pollution.

Effective cation-exchange capacity refers to the sum of extractable bases plus aluminum expressed in terms of milliequivalents per 100 grams of soil. It is determined for soils that have pH of less than 5.5.

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

Calcium carbonate equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil. Incorporating nitrogen fertilizer into calcareous soils helps to prevent nitrite accumulation and ammonium-N volatilization.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 20, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained by returning crop residue to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops.

Sodium adsorption ratio (SAR) is a measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration. Soils that have SAR values of 13 or more may be characterized by an increased dispersion of organic matter and clay particles, reduced permeability and aeration, and a general degradation of soil structure.

Water Features

Table 21 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.

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 21 indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding 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* of flooding 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). *Common* is used when the occasional and frequent classes are grouped for certain purposes.

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.

Water table refers to a saturated zone in the soil. Table 21 indicates the depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone for the specified *months* 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.

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

Soil Features

Table 22 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, natric horizons, dense layers, and frozen layers. The table indicates the thickness and hardness of the restrictive layer, both of which significantly affect the ease of excavation. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

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.

Engineering Index Test Data

Table 23 shows laboratory test data for several pedons sampled at carefully selected sites in the survey area. The pedons are representative of the series described in the section “Soil Series and Detailed Soil Map Units.” The soil samples were tested by the Illinois Department of Transportation, Springfield, Illinois.

The testing methods generally are those of the American Association of State Highway and Transportation Officials (AASHTO) or the American Society for Testing and Materials (ASTM).

The tests and methods are Moisture density—T 99 (AASHTO), D 698 (ASTM); Mechanical analysis—T 88 (AASHTO), D 422 (ASTM), D 2217 (ASTM); Liquid limit—T 89 (AASHTO), D 4318 (ASTM); Plasticity index—T 90 (AASHTO), D 4318 (ASTM); AASHTO classification—M 145 (AASHTO), D 3282 (ASTM); and Unified classification—D 2487-00 (ASTM).

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Brady, Nyle C. 1984. The nature and properties of soils. 9th edition. Cornell University and U.S. Agency for International Development.

City of Centralia, Illinois. Web site. http://city.centralia.il.us/index.pl?iid-3588

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. September 18, 2002. Hydric soils of the United States.

Frankie, W.T., R.J. Jacobson, M.M. Killey, M.A. Phillips, D.L. Reinertson, C.J. Zelinsky, R. Barrett, J. Hankinson, and M. Redding. 1995. Guide to the geology of the Salem area, Marion County, Illinois.

Hansel, A.K., and W.H. Johnson. 1996. Wedron and Mason Groups: Lithostratigraphic reclassification of deposits of the Wisconsin Episode, Lake Michigan Lobe area. Department of Natural Resources, Illinois State Geological Survey. Bulletin 104.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

Illinois Department of Agriculture. Web site. http://www.agr.state.il.us/gis/stats/landcover/counties/county.php?CNTY=Marion

Illinois Department of Agriculture. 2006. Illinois soil conservation transect survey summary.

Illinois Department of Natural Resources. Web site. http://dnr.state.il.us/orc/prairieridge/index.htm

Illinois Department of Natural Resources. 1996. Digital data of Illinois. Illinois Geographical Information Systems.

Illinois Department of Natural Resources and Illinois State Geological Survey. 2008. Directory of coal mines in Illinois.

Illinois Genealogy Trails. Web site. http://genealogytrails.com/ill/

Iverson, L.R., R.L. Oliver, D.P. Tucker, P.G. Risser, C.D. Burnett, and R.G. Rayburn. 1989. The forest resources of Illinois: An atlas and analysis of spatial and temporal attributes. Illinois Natural History Survey, Special Publication 11.

Jacobson, R.J., and C. Korose. 2003. Coal geology of Illinois. *In* 2003 Keystone Coal Industry Manual, pages 503-514.

Jenny, Hans. 1941. Factors of soil formation.

Leighton, M.M., G.E. Ekblaw, and L. Horberg. 1948. Physiographic divisions of Illinois. Illinois State Geological Survey, Report of Investigations 129.

Lineback, J.A., and others. 1979. Quaternary deposits of Illinois. Illinois State Geological Survey. Map 1:500,000.

Miles, C.C. 1996. Soil survey of Marion County, Illinois. U.S. Department of Agriculture, Natural Resources Conservation Service. Illinois Agricultural Experiment Station Soil Report 144.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Olson, K.R., and J.M. Lang. 2000. Optimum crop productivity ratings for Illinois soils. University of Illinois, College of Agricultural, Consumer and Environmental Sciences. Bulletin 811.

Olson, K.R., J.M. Lang, J.D. Garcia-Paredes, R.N. Majchrzak, C.I. Hadley, M.E. Woolery, and R.M. Rejesus. 2000. Average crop, pasture, and forestry productivity ratings for Illinois soils. University of Illinois, College of Agricultural, Consumer and Environmental Sciences. Bulletin 810.

Richmond, G.M., and D.S. Fullerton. 1983. Quaternary geologic map of the Chicago 4º x 6º quadrangle, United States: U.S. Department of the Interior and U.S. Geological Survey. Quaternary Geologic Atlas of the United States, Miscellaneous Investigations Series, Map I-1420 (NK-16).

Salem, Illinois. Web site. http://www.salemil.us/pages/SalemIL_DPW/water

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://soils.usda.gov/technical/

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.

Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

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. Soil Conservation Service. U.S. Department of Agriculture Handbook 210.

United States Department of Agriculture, National Agricultural Statistics Service. Web site. http://www.nass.usda.gov/Statistics_by_State/Illinois/Publications/County_Estimates/index.asp

United States Department of Agriculture, National Agricultural Statistics Service. 2002. Illinois 2002 census of agriculture, county data. http://www.agcensus.usda.gov/

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://soils.usda.gov/technical/

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://soils.usda.gov/technical/

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://soils.usda.gov/

United States Department of Commerce, Bureau of the Census. Census 2007 factfinder. http://factfinder.census.gov/

Willman, H.B., E. Atherton, T.C. Buschbach, C. Collinson, J.C. Frye, M.E. Hopkins, and J.A. Simon. 1975. Handbook of Illinois stratigraphy. Illinois State Geological Survey Bulletin 95.

Willman, H.B., and J.C. Frye. 1970. Pleistocene stratigraphy of Illinois. Illinois Geological Survey Bulletin 94.

Glossary

Many of the terms relating to landforms, geology, and geomorphology are defined in more detail in the “National Soil Survey Handbook” (available in local offices of the Natural Resources Conservation Service or on the Internet).

Ablation till. Loose, relatively permeable earthy material deposited during the downwasting of nearly static glacial ice, either contained within or accumulated on the surface of the glacier.

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.

Alluvial fan. A low, outspread mass of loose materials and/or rock material, commonly with gentle slopes. It is shaped like an open fan or a segment of a cone. The material was deposited by a stream at the place where it issues from a narrow mountain valley or upland valley or where a tributary stream is near or at its junction with the main stream. The fan is steepest near its apex, which points upstream, and slopes gently and convexly outward (downstream) with a gradual decrease in gradient.

Alluvium. Unconsolidated material, such as gravel, sand, silt, clay, and various mixtures of these, deposited on land by running water.

Alpha,alpha-dipyridyl. A compound that when dissolved in ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction implies reducing conditions and the likely presence of redoximorphic features.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Aspect. The direction toward which a slope faces. Also called slope aspect.

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.

Backswamp. A flood-plain landform. Extensive, marshy or swampy, depressed areas of flood plains between natural levees and valley sides or terraces.

Basal area. The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.

Basal till. Compact 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.

Base slope (geomorphology). A geomorphic component of hills consisting of the concave to linear (perpendicular to the contour) slope that, regardless of the lateral shape, forms an apron or wedge at the bottom of a hillside dominated by colluvium and slope-wash sediments (for example, slope alluvium).

Batavia facies (geology). An informal separation of the Henry Formation. The Batavia facies occurs on outwash plains and consists of stratified silt loam to gravelly sandy loam with thin bands of finer or coarser material.

Batestown Member (geology). The medium textured, lowermost unit of diamicton in the Lemont Formation. Diamicton of the Batestown Member generally consists of calcareous, dark gray to gray silt loam to loam that contains lenses of gravel, sand, silt, and clay. Locally, the Batestown Member is finer texturally and therefore similar to the Yorkville Member.

Bedding plane. A planar or nearly planar bedding surface that visibly separates each successive layer of stratified sediment or rock (of the same or different lithology) from the preceding or following layer; a plane of deposition. It commonly marks a change in the circumstances of deposition and may show a parting, a color difference, a change in particle size, or various combinations of these. The term is commonly applied to any bedding surface, even one that is conspicuously bent or deformed by folding.

Bedding system. A drainage system made by plowing, grading, or otherwise shaping the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

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.

Bottom land. An informal term loosely applied to various portions of a flood plain.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Breaks. A landscape or tract of steep, rough or broken land dissected by ravines and gullies and marking a sudden change in topography.

Breast height. An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.

Brush management. Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

Cahokia Formation (geology). Deposits on flood plains and in channels of modern rivers and streams. Mostly poorly sorted sand, silt, or clay containing local deposits of sandy gravel.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Calcium carbonate. A common mineral in sediments and soils.

Canopy. The leafy crown of trees or shrubs. (See Crown.)

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Carmi facies (geology). Largely quiet-water lake sediments dominated by well bedded silt and some clay. (See Equality Formation.)

Catena. A sequence, or “chain,” of soils on a landscape that formed in similar kinds of parent material and under similar climatic conditions but that have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Catsteps. See Terracettes.

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. See Redoximorphic features.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A dense, compact, slowly permeable subsoil layer that contains much more clay than the overlying materials, from which it is separated by a sharply defined boundary. A claypan is commonly hard when dry and plastic and sticky when wet.

Climax plant community. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material. Material that has 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

COLE (coefficient of linear extensibility). See Linear extensibility.

Colluvium. Unconsolidated, unsorted earth material being transported or deposited on side slopes and/or at the base of slopes by mass movement (e.g., direct gravitational action) and by local, unconcentrated runoff.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions. See Redoximorphic features.

Congeliturbate. Soil material disturbed by frost action.

Conglomerate. A coarse grained, clastic sedimentary rock composed of rounded or subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer textured material. Conglomerate is the consolidated equivalent of gravel.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the “Soil Survey Manual.”

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Coprogenous earth (sedimentary peat). A type of limnic layer composed predominantly of fecal material derived from aquatic animals.

Corrosion (geomorphology). A process of erosion whereby rocks and soil are removed or worn away by natural chemical processes, especially by the solvent action of running water, but also by other reactions, such as hydrolysis, hydration, carbonation, and oxidation.

Corrosion (soil survey interpretations). Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cropping system. Growing crops according to a planned system of rotation and management practices.

Cross-slope farming. Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.

Crown. The upper part of a tree or shrub, including the living branches and their foliage.

Culmination of the mean annual increment (CMAI). The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Delavan Member (geology). The lower part of the Tiskilwa Formation deposited between 26,000 and 18,500 radiocarbon years ago. Consists of calcareous, brownish gray to pink or violet gray loam diamicton. Reclassified to include the former Fairgrange Till Member.

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.

Diamicton. A generic term for a till-like mixture of unsorted, unstratified rock debris composed of a wide range of particle sizes. Use of this term carries no suggestion about how such debris was formed or deposited.

Diatomaceous earth. A geologic deposit of fine, grayish siliceous material composed chiefly or entirely of the remains of diatoms.

Dip slope. A slope of the land surface, roughly determined by and approximately conforming to the dip of the underlying bedrock.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Divided-slope farming. A form of field stripcropping in which crops are grown in a systematic arrangement of two strips, or bands, across the slope to reduce the hazard of water erosion. One strip is in a close-growing crop that provides protection from erosion, and the other strip is in a crop that provides less protection from erosion. This practice is used where slopes are not long enough to permit a full stripcropping pattern to be used.

Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained*. These classes are defined in the “Soil Survey Manual.”

Drainage, surface. Runoff, or surface flow of water, from an area.

Drainageway. A general term for a course or channel along which water moves in draining an area. A term restricted to relatively small, linear depressions that at some time move concentrated water and either do not have a defined channel or have only a small defined channel.

Drift. A general term applied to all mineral material (clay, silt, sand, gravel, and boulders) transported by a glacier and deposited directly by or from the ice or transported by running water emanating from a glacier. Drift includes unstratified material (till) that forms moraines and stratified deposits that form outwash plains, eskers, kames, varves, and glaciofluvial sediments. The term is generally applied to Pleistocene glacial deposits in areas that no longer contain glaciers.

Drumlin. A low, smooth, elongated oval hill, mound, or ridge of compact till that has a core of bedrock or drift. It commonly has a blunt nose facing the direction from which the ice approached and a gentler slope tapering in the other direction. The longer axis is parallel to the general direction of glacier flow. Drumlins are products of streamline (laminar) flow of glaciers, which molded the subglacial floor through a combination of erosion and deposition.

Duff. A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

Dune. A low mound, ridge, bank, or hill of loose, windblown granular material (generally sand), either barren and capable of movement from place to place or covered and stabilized with vegetation but retaining its characteristic shape.

Earthy fill. See Mine spoil.

Ecological site. An area where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. An ecological site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other ecological sites in kind and/or proportion of species or in total production.

Electrical conductivity. The electrolytic conductivity of an extract from saturated soil paste. It is a measure of the concentration of water-soluble salts in soil and is expressed as millimhos per centimeter at 25 degrees C.

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.

End moraine. A ridgelike accumulation that is being or was produced at the outer margin of an actively flowing glacier at any given time.

Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Eolian deposit. Sand-, silt-, or clay-sized clastic material transported and deposited primarily by wind, commonly in the form of a dune or a sheet of sand or loess.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Equality Formation (geology). This formation consists of gray to red silt and clay, generally shows evidence of bedding structures, and occurs above the Sangamon Geosol. Predominantly occurs as a fine grained lacustrine sediment. Ranges from 26,000 radiocarbon years to present in age. (See Mason Group.)

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Erosion surface. A land surface shaped by the action of erosion, especially by running water.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Most commonly applied to cliffs produced by differential erosion. Synonym: scarp.

Esker. A long, narrow, sinuous, steep-sided ridge of stratified sand and gravel deposited as the bed of a stream flowing in an ice tunnel within or below the ice (subglacial) or between ice walls on top of the ice of a wasting glacier and left behind as high ground when the ice melted. Eskers range in length from less than a kilometer to more than 160 kilometers and in height from 3 to 30 meters.

Extrusive rock. Igneous rock derived from deep-seated molten matter (magma) deposited and cooled on the earth's surface.

Fairgrange Till Member (geology). Abandoned nomenclature. Pink, reddish brown, and brownish gray sandy till in east-central Illinois. (See Delavan Member.)

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.

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

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity*.

Fill slope. A sloping surface consisting of excavated soil material from a road cut. It commonly is on the downhill side of the road.

Fine textured soil. Sandy clay, silty clay, or clay.

Firebreak. An area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of firefighters and equipment. Designated roads also serve as firebreaks.

First bottom. An obsolete, informal term loosely applied to the lowest flood-plain steps that are subject to regular flooding.

Flaggy soil material. Material that has, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

Flood plain. The nearly level plain that borders a stream and is subject to flooding unless protected artificially.

Flood-plain landforms. A variety of constructional and erosional features produced by stream channel migration and flooding. Examples include backswamps, flood-plain splays, meanders, meander belts, meander scrolls, oxbow lakes, and natural levees.

Flood-plain splay. A fan-shaped deposit or other outspread deposit formed where an overloaded stream breaks through a levee (natural or artificial) and deposits its material (commonly coarse grained) on the flood plain.

Flood-plain step. An essentially flat, terrace-like alluvial surface within a valley that is frequently covered by floodwater from the present stream; any approximately horizontal surface still actively modified by fluvial scour and/or deposition. May occur individually or as a series of steps.

Fluvial. Of or pertaining to rivers or streams; produced by stream or river action.

Footslope. The concave surface at the base of a hillslope. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

Forb. Any herbaceous plant not a grass or a sedge.

Forest cover. All trees and other woody plants (underbrush) covering the ground in a forest.

Forest type. A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Geosol. A buried soil that formed on a landscape in the past with distinctive morphological features resulting from a soil-forming environment that no longer exists at the site. The former pedogenic process was interrupted by burial. A geosol is a laterally traceable, mappable, geologic weathering profile that has a consistent stratigraphic position. (See Paleosol.)

Glacial (geology). This term embraces both the processes and results of erosion and deposition arising from the presence of an ice mass (glacier) on a landscape.

Glacial lake (relict). An area formerly occupied by a glacial lake. (See Glaciolacustrine deposits.)

Glaciofluvial deposits. Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur in the form of outwash plains, valley trains, deltas, kames, eskers, and kame terraces.

Glaciolacustrine deposits. Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are bedded or laminated.

Glasford Formation (geology). Encompasses all till members of Illinoian age in Illinois.

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 moraine. An extensive, fairly even layer of till having an uneven or undulating surface.

Ground water. Water filling all the unblocked pores of the material below the water table.

Gully. A small channel with steep sides caused by erosion and cut in unconsolidated materials by concentrated but intermittent flow of water. 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.

Haeger Member (geology). The coarse grained, uppermost unit of diamicton in the Lemont Formation. The Haeger Member consists of calcareous, light gray to gray, gravelly sandy loam diamicton that contains lenses of gravel, sand, silt, and clay.

Hagarstown Member (geology). The Hagarstown Member of the Pearl Formation is chiefly well sorted sand and gravel in the form of kames and eskers overlying till of the Glasford Formation.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hard to reclaim (in tables). Reclamation is difficult after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

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 slope (geomorphology). A geomorphic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainageway. The overland waterflow is converging.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.

Henry Formation (geology). Consists of stratified sand and gravel that occurs above the Sangamon Geosol.

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 generic term for an elevated area 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. Slopes are generally more than 15 percent. The distinction between a hill and a mountain is arbitrary and may depend on local usage.

Hillslope. A generic term for the steeper part of a hill between its summit and the drainage line, valley flat, or depression floor at the base of a hill.

Holocene (geology). Postglacial age or time period (interglacial). About 0 to 12,600 years before present. (See Quaternary.)

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.

L horizon.—A layer of organic and mineral limnic materials, including coprogenous earth (sedimentary peat), diatomaceous earth, and marl.

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 that was formed by cooling and solidification of magma and that has not been changed appreciably by weathering since its formation. Major varieties include plutonic and volcanic rock (e.g., andesite, basalt, and granite).

Illinoian (geology). In Illinois, represents the glacial age of ice advance preceding the Sangamonian and Wisconsinan and following the Yarmouthian and pre-Illinoian during the Pleistocene. This glaciation practically covered the entire State of Illinois with the exception of small portions in northwestern, western, and southern Illinois. (See Pleistocene.)

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Interfluve. A landform composed of the relatively undissected upland or ridge between two adjacent valleys containing streams flowing in the same general direction. An elevated area between two drainageways that sheds water to those drainageways.

Interfluve (geomorphology). A geomorphic component of hills consisting of the uppermost, comparatively level or gently sloping area of a hill; shoulders of backwearing hillslopes can narrow the upland or can merge, resulting in a strongly convex shape.

Interglacial. A period of time between major glacial stages. (See Holocene, Sangamonian, and Yarmouthian.)

Intermittent stream. A stream, or reach of a stream, that does not flow year-round but that is commonly dry for 3 or more months out of 12 and whose channel is generally below the local water table. It flows only during wet periods or when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

Iron depletions. See Redoximorphic features.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation include:

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

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.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Kame. A low mound, knob, hummock, or short irregular ridge composed of stratified sand and gravel deposited by a subglacial stream as a fan or delta at the margin of a melting glacier; by a supraglacial stream in a low place or hole on the surface of the glacier; or as a ponded deposit on the surface or at the margin of stagnant ice.

Karst (topography). A kind of topography that formed in limestone, gypsum, or other soluble rocks by dissolution and that is characterized by closed depressions, sinkholes, caves, and underground drainage.

Knoll. A small, low, rounded hill rising above adjacent landforms.

Ksat. 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.

Lake plain. A nearly level surface marking the floor of an extinct lake filled by well sorted, generally fine textured, stratified deposits, commonly containing varves.

Lake terrace. A narrow shelf, partly cut and partly built, produced along a lakeshore in front of a scarp line of low cliffs and later exposed when the water level falls.

Landslide. A general, encompassing term for most types of mass movement landforms and processes involving the downslope transport and outward deposition of soil and rock materials caused by gravitational forces; the movement may or may not involve saturated materials. 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.

Lemont Formation (geology). The Lemont Formation of the Wedron Group is the succession of fine to coarse textured gray diamicton units that overlie the Tiskilwa Formation. The Lemont Formation has four differentiated members: the Lemont Member, the Batestown Member, the Yorkville Member, and the Haeger Member. In northern Illinois, the Lemont Formation is not subdivided. The Lemont Formation consists of calcareous, gray, fine to coarse textured diamicton units that contain lenses of gravel, sand, silt, and clay.

Linear extensibility. Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is used to determine the shrink-swell potential of soils. It is an expression of the volume change between the water content of the clod at $^{1}/_{3}$- or $^{1}/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Material transported and deposited by wind and consisting dominantly of silt-sized particles.

Low strength. The soil is not strong enough to support loads.

Low-residue crops. Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

Mackinaw facies (geology). An informal separation of the Henry Formation. The Mackinaw facies consists of well sorted sand and gravel outwash deposits in valleys leading outward from glacier fronts. Preserved today as terraces beneath Holocene deposits in major stream and river valleys.

Major land resource area (MLRA). A geographic area characterized by a particular pattern of land uses, elevation and topography, soils, climate, water resources, and potential natural vegetation.

Marl. An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal proportions; formed primarily under freshwater lacustrine conditions but also formed in more saline environments.

Mason Group (geology). The Mason Group comprises three proglacial and one postglacial sorted sediment formations that represent distinct stratigraphic layers based on grain size and bedding characteristics. The proglacial units are Roxana

Silt, Peoria Silt, and the Henry Formation. The postglacial unit is the Equality Formation.

Mass movement. A generic term for the dislodgment and downslope transport of soil and rock material as a unit under direct gravitational stress.

Masses. See Redoximorphic features.

Meander belt. The zone within which migration of a meandering channel occurs; the flood-plain area included between two imaginary lines drawn tangential to the outer bends of active channel loops.

Meander scar. A crescent-shaped, concave or linear mark on the face of a bluff or valley wall, produced by the lateral erosion of a meandering stream that impinged upon and undercut the bluff.

Meander scroll. One of a series of long, parallel, close-fitting, crescent-shaped ridges and troughs formed along the inner bank of a stream meander as the channel migrated laterally down-valley and toward the outer bank.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement at depth in the earth's crust. Nearly all such rocks are crystalline.

Mine spoil. An accumulation of displaced earthy material, rock, or other waste material removed during mining or excavation. Also called earthy fill.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. A kind of map unit that has little or no natural soil and supports little or no vegetation.

MLRA (major land resource area). A geographic area characterized by a particular pattern of land uses, elevation and topography, soils, climate, water resources, and potential natural 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.

Moraine. In terms of glacial geology, a mound, ridge, or other topographically distinct accumulation of unsorted, unstratified drift, predominantly till, deposited primarily by the direct action of glacial ice in a variety of landforms. Also, a general term for a landform composed mainly of till (except for kame moraines, which are composed mainly of stratified outwash) that has been deposited by a glacier. Some types of moraines are disintegration, end, ground, kame, lateral, recessional, and terminal.

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.)

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. See Redoximorphic features.

Nose slope (geomorphology). A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent. Nose slopes consist dominantly of colluvium and slope-wash sediments (for example, slope alluvium).

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Outwash. Stratified and sorted sediments (chiefly sand and gravel) removed or “washed out” from a glacier by meltwater streams and deposited in front of or beyond the end moraine or the margin of a glacier. The coarser material is deposited nearer to the ice.

Outwash plain. An extensive lowland area of coarse textured glaciofluvial material. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

Paleosol. A general term used to describe a soil that formed on a landscape of the past; it may be a buried soil, a relict soil, or an exhumed soil. (See Geosol.)

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.

Parkland facies (geology). The Parkland facies is an informal separation of the Henry Formation occurring as dunes in outwash areas and is an informal separation of Peoria Silt if interfingered with silt in bluff areas. It consists of well sorted eolian sand deposits in the form of dunes or sheetlike deposits.

Pearl Formation (geology). Illinois outwash that generally overlies the Glasford Formation.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedisediment. A layer of sediment, eroded from the shoulder and backslope of an erosional slope, that lies on and is being (or was) transported across a gently sloping erosional surface at the foot of a receding hill or mountain slope.

Pedon. The smallest volume that can be called “a soil.” A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Peoria Silt (geology). Light yellow tan to gray calcareous silt that grades from sandy silt in the bluffs to clayey silt away from the bluffs. The upper part of Peoria Silt is also informally known as Richland loess where it overlies the Wedron Group. The lower part, where buried by materials of the Wedron Group, is known as the Morton Tongue. Peoria Silt covers most of Illinois and ranges in thickness from 80 feet in bluff areas along the Mississippi River to 1 or 2 feet in areas away from the bluffs. Deposition occurred 25,000 to 12,000 years ago. (See Mason Group.)

Percolation. The movement of water through the soil.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as “saturated hydraulic conductivity,” which is defined in the “Soil Survey Manual.” In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as “permeability.” Terms describing permeability, measured in inches per hour, are as follows:

Impermeable	less than 0.0015 inch
Very slow	0.0015 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

Piatt Member (geology). The upper diamicton facies of the Tiskilwa Formation deposited between 19,000 and 18,500 radiocarbon years ago. The Piatt Member consists of gray loam diamicton containing lenses of sorted sediment. Textures may vary, especially near the surface, where this member is commonly interbedded with stratified sediment.

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Pitting (in tables). Pits caused by melting around ice. They form on the soil after plant cover is removed.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plateau (geomorphology). A comparatively flat area of great extent and elevation; specifically, an extensive land region that is considerably elevated (more than 100 meters) above the adjacent lower lying terrain, is commonly limited on at least one side by an abrupt descent, and has a flat or nearly level surface. A comparatively large part of a plateau surface is near summit level.

Pleistocene (geology). The period in a geologic time series that encompasses all glacial and interglacial stages. Includes the Wisconsinan, Sangamonian, Illinoian, Yarmouthian, and pre-Illinoian. The period covered is about 12,600 to 2 million years before present.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Pore linings. See Redoximorphic features.

Potential native plant community. See Climax plant community.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning. Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Quaternary (geology). The latest period of time in the stratigraphic column, about 0 to 2 million years before present, represented by local accumulations of glacial (Pleistocene) and postglacial (Holocene) deposits. An artificial division of time used to separate pre-human from post-human sedimentation.

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

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Redoximorphic concentrations. See Redoximorphic features.

Redoximorphic depletions. See Redoximorphic features.

Redoximorphic features. Redoximorphic features are associated with wetness and result from alternating periods of reduction and oxidation of iron and manganese compounds in the soil. Reduction occurs during saturation with water, and oxidation occurs when the soil is not saturated. Characteristic color patterns are created by these processes. The reduced iron and manganese ions may be removed from a soil if vertical or lateral fluxes of water occur, in which case there is no iron or manganese precipitation in that soil. Wherever the iron and manganese are oxidized and precipitated, they form either soft masses or hard concretions or nodules. Movement of iron and manganese as a result of redoximorphic processes in a soil may result in redoximorphic features that are defined as follows:

1. Redoximorphic concentrations.—These are zones of apparent accumulation of iron-manganese oxides, including:
   A. Nodules and concretions, which are cemented bodies that can be removed from the soil intact. Concretions are distinguished from nodules on the basis of internal organization. A concretion typically has concentric layers that are visible to the naked eye. Nodules do not have visible organized internal structure; *and*
   B. Masses, which are noncemented concentrations of substances within the soil matrix; *and*
   C. Pore linings, i.e., zones of accumulation along pores that may be either coatings on pore surfaces or impregnations from the matrix adjacent to the pores.
2. Redoximorphic depletions.—These are zones of low chroma (chromas less than those in the matrix) where either iron-manganese oxides alone or both iron-manganese oxides and clay have been stripped out, including:
   A. Iron depletions, i.e., zones that contain low amounts of iron and manganese oxides but have a clay content similar to that of the adjacent matrix; *and*
   B. Clay depletions, i.e., zones that contain low amounts of iron, manganese, and clay (often referred to as silt coatings or skeletans).
3. Reduced matrix.—This is a soil matrix that has low chroma *in situ* but undergoes a change in hue or chroma within 30 minutes after the soil material has been exposed to air.

Reduced matrix. See Redoximorphic features.
Regolith. All unconsolidated earth materials above the solid bedrock. It includes material weathered in place from all kinds of bedrock and alluvial, glacial, eolian, lacustrine, and pyroclastic deposits.
Relief. The relative difference in elevation between the upland summits and the lowlands or valleys of a given region.
Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as bedrock disintegrated in place.
Rill. A very small, steep-sided channel resulting from erosion and cut in unconsolidated materials by concentrated but intermittent flow of water. A rill generally is not an obstacle to wheeled vehicles and is shallow enough to be smoothed over by ordinary tillage.
Riser. The vertical or steep side slope (e.g., escarpment) of terraces, flood-plain steps, or other stepped landforms; commonly a recurring part of a series of natural, steplike landforms, such as successive stream terraces.
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.
Root zone. The part of the soil that can be penetrated by plant roots.
Roxana Silt (geology). Brownish red and gray silt loam. Typically leached of carbonates. It overlies the Sangamon Geosol and is typically bounded above by Peoria Silt. It can be distinguished from Peoria Silt by being darker brown and

more clayey. Deposition occurred 55,000 to 27,000 radiocarbon years ago. (See Mason Group.)

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.

Salinity. The relative proportion of salt in a soil solution; measured using electrical conductivity.

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.

Sangamonian (geology). In Illinois, represents an interglacial age between the Illinoian and Wisconsinan glacial stages during the Pleistocene. (See Pleistocene; Geosol.)

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saturated hydraulic conductivity (Ksat). See Permeability.

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Scarification. The act of abrading, scratching, loosening, crushing, or modifying the surface to increase water absorption or to provide a more tillable soil.

Sedimentary rock. A consolidated deposit of clastic particles, chemical precipitates, or organic remains accumulated at or near the surface of the earth under normal low temperature and pressure conditions. Sedimentary rocks include consolidated equivalents of alluvium, colluvium, drift, and eolian, lacustrine, and marine deposits. Examples are sandstone, siltstone, mudstone, claystone, shale, conglomerate, limestone, dolomite, and coal.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock that formed by the hardening of a deposit of clay, silty clay, or silty clay loam and that has a tendency to split into thin layers.

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

Shoulder. The convex, erosional surface near the top of a hillslope. A shoulder is a transition from summit to backslope.

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 (geomorphology). A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel. Side slopes are dominantly colluvium and slope-wash sediments.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silica-sesquioxide ratio. The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

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

Siltstone. An indurated silt having the texture and composition of shale but lacking its fine lamination or fissility; a massive mudstone in which silt predominates over clay.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Sinkhole. A closed, circular or elliptical depression, commonly funnel shaped, characterized by subsurface drainage and formed either by dissolution of the surface of underlying bedrock (e.g., limestone, gypsum, or salt) or by collapse of underlying caves within bedrock. Complexes of sinkholes in carbonate-rock terrain are the main components of karst topography.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Slickensides (pedogenic). Grooved, striated, and/or glossy (shiny) slip faces on structural peds, such as wedges; produced by shrink-swell processes, most commonly in soils that have a high content of expansive clays.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey, classes for simple slopes are as follows:

Nearly level	0 to 2 percent
Gently sloping	2 to 5 percent
Strongly sloping	5 to 10 percent
Moderately steep	10 to 18 percent
Steep	18 to 35 percent
Very steep	35 percent and higher

Slope alluvium. Sediment gradually transported down the slopes of mountains or hills primarily by nonchannel alluvial processes (i.e., slope-wash processes) and characterized by particle sorting. Lateral particle sorting is evident on long slopes. In a profile sequence, sediments may be distinguished by differences in size and/or specific gravity of rock fragments and may be separated by stone lines. Burnished peds and sorting of rounded or subrounded pebbles or cobbles distinguish these materials from unsorted colluvial deposits.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

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.

Stone line. In a vertical cross section, a line formed by scattered fragments or a discrete layer of angular and subangular rock fragments (commonly a gravel- or cobble-sized lag concentration) that formerly was draped across a topographic surface and was later buried by additional sediments. A stone line generally caps material that was subject to weathering, soil formation, and erosion before burial. Many stone lines seem to be buried erosion pavements, originally formed by sheet and rill erosion across the land surface.

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 type of stream terrace; formed as an erosional surface cut on bedrock and thinly mantled with stream deposits (alluvium).

Stream terrace. One of a series of platforms in a stream valley, flanking and more or less parallel to the stream channel, originally formed near the level of the stream; represents the remnants of an abandoned flood plain, stream bed, or valley floor produced during a former state of fluvial erosion or deposition.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single 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.

Summer fallow. The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Summit. The topographically highest position of a 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.

Talf. A geomorphic component of flat plains consisting of an essentially flat and broad area dominated by closed depressions and a nonintegrated or poorly integrated drainage system. Precipitation tends to pond locally, and lateral transport is slow both above and below ground. These conditions favor the accumulation of soil organic matter and a retention of fine earth sediments; better drained soils are commonly adjacent to drainageways.

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.

Terminal moraine. An end moraine that marks the farthest advance of a glacier. It typically has the form of a massive arcuate or concentric ridge, or complex of ridges, and is underlain by till and other types of drift.

Terrace (conservation). 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 (geomorphology). A steplike surface, bordering a valley floor or shoreline, that represents the former position of a flood plain, lake, or seashore. The term is usually applied both to the relatively flat summit surface (tread) that was cut or built by stream or wave action and to the steeper descending slope (scarp or riser) that has graded to a lower base level of erosion.

Terracettes. Small, irregular steplike forms on steep hillslopes, especially in pasture, formed by creep or erosion of surficial materials that may be induced or enhanced by trampling of livestock, such as sheep or cattle.

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. Dominantly unsorted and nonstratified drift, generally unconsolidated and deposited directly by a glacier without subsequent reworking by meltwater, and consisting of a heterogeneous mixture of clay, silt, sand, gravel, stones, and boulders; rock fragments of various lithologies are embedded within a finer matrix that can range from clay to sandy loam.

Till plain. An extensive area of level to gently undulating soils underlain predominantly by till and bounded at the distal end by subordinate recessional or end moraines.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Tiskilwa Formation (geology). The lowermost sequence of red to gray diamicton units of the Wedron Group. The Tiskilwa Formation has three differentiated members: the Tiskilwa Member, the Delavan Member, and the Piatt Member. In northern Illinois, the Lemont Formation is not subdivided. The Tiskilwa Formation consists of calcareous, reddish gray to gray, medium textured (clay loam to loam) diamicton units that contain lenses of gravel, sand, silt, and clay. Typically it oxidizes to reddish brown, brown, or yellowish brown.

Toeslope. 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.

Tread. The flat to gently sloping, topmost, laterally extensive slope of terraces, flood-plain steps, or other stepped landforms; commonly a recurring part of a series of natural steplike landforms, such as successive stream terraces.

Upland. An informal, general term for the higher ground of a region, in contrast with a low-lying adjacent area, such as a valley or plain, or for land at a higher elevation than the flood plain or low stream terrace; land above the footslope zone of the hillslope continuum.

Valley fill. The unconsolidated sediment deposited by any agent (water, wind, ice, or mass wasting) so as to fill or partly fill a valley.

Vandalia Till Member (geology). The Vandalia Till Member of the Glasford Formation consists of clay loam diamicton. It is generally gray and calcareous, except where weathered. It is commonly 25 to 30 feet thick and bounded at the top by the Sangamon Geosol.

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.

Wasco facies (geology). The Wasco facies is an informal separation of the Henry Formation. It consists of poorly sorted sand and gravel outwash deposits in kames, eskers, and deltas.

Water bars. Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.

Weathering. All physical disintegration, chemical decomposition, and biologically induced changes in rocks or other deposits at or near the earth’s surface by atmospheric or biologic agents or by circulating surface waters but involving essentially no transport of the altered material.

Wedron Group (geology). Mostly diamicton of the Wisconsinan Age.

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.

Wisconsinan (geology). In Illinois, represents the last glacial stage of ice advance during the Pleistocene. Follows the Sangamonian interglacial stage. (See Pleistocene.)

Yarmouthian (geology). In Illinois, represents an interglacial stage between the pre-Illinoian and Illinoian glacial stages during the Pleistocene. (See Pleistocene.)

Yorkville Member (geology). The Yorkville Member is the middle unit of diamicton in the Lemont Formation. The Yorkville Member generally consists of calcareous gray, fine textured (silty clay to silty clay loam) diamicton that contains lenses of gravel, sand, silt, and clay. It typically oxidizes to olive brown. Locally, the Yorkville Member is coarser texturally and therefore similar to the Batestown Member.

Tables

Table 1.--Temperature and Precipitation

(Recorded in the period 1971-2000 at Salem, 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----	37.8	20.8	29.3	66	-10	4	2.47	0.88	3.89	5	5.3
February---	44.1	25.3	34.7	72	-6	13	2.53	1.36	3.66	4	3.3
March------	55.3	34.5	44.9	82	9	72	3.98	2.35	5.54	7	1.5
April------	66.8	44.1	55.4	87	24	214	4.01	2.01	5.64	7	.3
May--------	76.5	53.8	65.1	91	35	470	4.37	2.18	6.02	7	.0
June-------	85.3	62.8	74.0	97	46	721	4.15	1.98	6.02	7	.0
July-------	89.0	66.9	77.9	99	53	866	3.90	1.82	5.77	5	.0
August-----	87.2	64.7	76.0	99	51	805	3.43	1.69	5.00	5	.0
September--	80.5	56.9	68.7	95	37	560	3.22	1.36	4.99	5	.0
October----	69.3	45.4	57.3	88	26	259	3.10	1.71	4.14	5	.1
November---	54.5	35.6	45.1	78	14	68	4.12	1.86	6.38	6	.6
December---	42.2	25.6	33.9	67	-3	12	3.26	1.54	4.65	6	3.3
Yearly:											
Average---	65.7	44.7	55.2	---	---	---	---	---	---	---	---
Extreme---	105	-23	---	100	-14	---	---	---	---	---	---
Total-----	---	---	---	---	---	4,064	42.54	35.38	49.54	69	14.4

* 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 1971-2000 at Salem, 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. 8	Apr. 17	Apr. 24
2 years in 10 later than--	Apr. 2	Apr. 11	Apr. 20
5 years in 10 later than--	Mar. 23	Apr. 1	Apr. 11
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 26	Oct. 12	Oct. 4
2 years in 10 earlier than--	Nov. 2	Oct. 19	Oct. 9
5 years in 10 earlier than--	Nov. 14	Oct. 31	Oct. 19

Table 3.--Growing Season

(Recorded in the period 1971-2000 at Salem, 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	213	186	169
8 years in 10	221	195	176
5 years in 10	235	212	189
2 years in 10	249	228	203
1 year in 10	256	237	210

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
*Atlas	Fine, smectitic, mesic Aeric Endoaqualfs
*Atlas	Fine, smectitic, mesic Aquic Hapludalfs
Ava	Fine-silty, mixed, active, mesic Oxyaquic Fragiudalfs
Banlic	Coarse-silty, mixed, active, acid, mesic Fragic Epiaquepts
Belknap	Coarse-silty, mixed, active, acid, mesic Fluvaquentic Endoaquepts
*Birds	Fine-silty, mixed, superactive, nonacid, mesic Fluvaquentic Endoaquepts
Blair	Fine-silty, mixed, superactive, mesic Aquic Hapludalfs
Bluford	Fine, smectitic, mesic Aeric Fragic Epiaqualfs
Bonnie	Fine-silty, mixed, active, acid, mesic Typic Fluvaquents
*Bonnie	Fine-silty, mixed, active, acid, mesic Sodic Vermaquepts
Cisne	Fine, smectitic, mesic Mollic Albaqualfs
Creal	Fine-silty, mixed, superactive, mesic Aeric Endoaqualfs
Darmstadt	Fine-silty, mixed, superactive, mesic Aquic Natrudalfs
Gosport	Fine, illitic, mesic Oxyaquic Dystrudepts
*Grantfork	Fine, smectitic, mesic Albaquic Hapludalfs
*Grantfork	Fine-loamy, mixed, active, mesic Aquic Hapludalfs
Hickory	Fine-loamy, mixed, active, mesic Typic Hapludalfs
Holton	Coarse-loamy, mixed, active, nonacid, mesic Aeric Endoaquepts
Hoyleton	Fine, smectitic, mesic Aquollic Hapludalfs
Huey	Fine-silty, mixed, superactive, mesic Typic Natraqualfs
Kell	Fine-loamy, mixed, active, mesic Ultic Hapludalfs
Newberry	Fine-silty, mixed, superactive, mesic Mollic Endoaqualfs
*Orion	Coarse-loamy, mixed, superactive, nonacid, mesic Aquic Udifluvents
Orthents	Fine-silty, mixed, active, nonacid, mesic Typic Udorthents
Parke	Fine-silty, mixed, active, mesic Ultic Hapludalfs
Passport	Fine-loamy, mixed, active, mesic Aquic Hapludalfs
Plumfield	Fine-silty, mixed, active, mesic Aquic Fragiudalfs
Racoon	Fine-silty, mixed, superactive, mesic Typic Endoaqualfs
Richview	Fine-silty, mixed, superactive, mesic Mollic Oxyaquic Hapludalfs
Sharon	Coarse-silty, mixed, active, acid, mesic Oxyaquic Udifluvents
Tamalco	Fine, smectitic, mesic Typic Natrudalfs
Wakeland	Coarse-silty, mixed, superactive, nonacid, mesic Aeric Fluvaquents
Wirt	Coarse-loamy, mixed, superactive, mesic Dystric Fluventic Eutrudepts
Wynoose	Fine, smectitic, mesic Typic Albaqualfs
Zipp	Fine, mixed, active, nonacid, mesic Typic Endoaquepts

Table 5.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
2A	Cisne silt loam, 0 to 2 percent slopes	33,262	9.0
3A	Hoyleton silt loam, 0 to 2 percent slopes	16,547	4.5
3B	Hoyleton silt loam, 2 to 5 percent slopes	6,911	1.9
3B2	Hoyleton silt loam, 2 to 5 percent slopes, eroded	5,962	1.6
4B	Richview silt loam, 2 to 5 percent slopes	522	0.1
4C2	Richview silt loam, 5 to 10 percent slopes, eroded	544	0.1
5C3	Blair silty clay loam, 5 to 10 percent slopes, severely eroded	95	*
7C2	Atlas silt loam, 5 to 10 percent slopes, eroded	4,833	1.3
7C3	Atlas silty clay loam, 5 to 10 percent slopes, severely eroded	1,794	0.5
7D2	Atlas silt loam, 10 to 18 percent slopes, eroded	3,295	0.9
7D3	Atlas silty clay loam, 10 to 18 percent slopes, severely eroded	1,241	0.3
8D3	Hickory clay loam, 10 to 18 percent slopes, severely eroded	12	*
8F	Hickory silt loam, 18 to 35 percent slopes	18,285	5.0
8G	Hickory loam, 35 to 60 percent slopes	816	0.2
10C	Plumfield silty clay loam, 5 to 10 percent slopes	968	0.3
12A	Wynoose silt loam, 0 to 2 percent slopes	12,782	3.5
13A	Bluford silt loam, 0 to 2 percent slopes	33,145	9.0
13B	Bluford silt loam, 2 to 5 percent slopes	14,018	3.8
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded	3,699	1.0
14B	Ava silt loam, 2 to 5 percent slopes	17,645	4.8
14C2	Ava silt loam, 5 to 10 percent slopes, eroded	2,907	0.8
15B2	Parke silt loam, 2 to 5 percent slopes, eroded	268	*
109A	Racoon silt loam, 0 to 2 percent slopes	615	0.2
120A	Huey silt loam, 0 to 2 percent slopes	668	0.2
218A	Newberry silt loam, 0 to 2 percent slopes	3,655	1.0
421G	Kell silt loam, 35 to 60 percent slopes	1,561	0.4
533	Urban land	1,095	0.3
551D2	Gosport silt loam, 10 to 18 percent slopes, eroded	1,062	0.3
551F	Gosport silt loam, 18 to 35 percent slopes	324	*
551G	Gosport silt loam, 35 to 60 percent slopes	135	*
581A	Tamalco silt loam, 0 to 2 percent slopes	163	*
652C2	Passport silt loam, 5 to 10 percent slopes, eroded	17,791	4.8
652D2	Passport silt loam, 10 to 18 percent slopes, eroded	2,314	0.6
801B	Orthents, silty, undulating	1,792	0.5
810	Oil-waste land, brine damaged	145	*
888C2	Passport-Grantfork silt loams, 5 to 10 percent slopes, eroded	7,406	2.0
908D2	Hickory-Kell silt loams, 10 to 18 percent slopes, eroded	1,938	0.5
908F	Hickory-Kell silt loams, 18 to 35 percent slopes	2,032	0.6
912A	Hoyleton-Darmstadt silt loams, 0 to 2 percent slopes	29,665	8.0
912B	Hoyleton-Darmstadt silt loams, 2 to 5 percent slopes	3,769	1.0
912B2	Hoyleton-Darmstadt silt loams, 2 to 5 percent slopes, eroded	9,008	2.4
914C2	Atlas-Grantfork silt loams, 5 to 10 percent slopes, eroded	5,205	1.4
929D2	Ava-Hickory silt loams, 10 to 18 percent slopes, eroded	2,616	0.7
947D2	Hickory-Passport silt loams, 10 to 18 percent slopes, eroded	6,502	1.8
947D3	Hickory-Passport clay loams, 10 to 18 percent slopes, severely eroded	3,039	0.8
967F	Hickory-Gosport silt loams, 18 to 35 percent slopes	3,375	0.9
991A	Cisne-Huey silt loams, 0 to 2 percent slopes	43,293	11.7
1524A	Zipp silty clay loam, undrained, 0 to 2 percent slopes, frequently flooded	297	*
3072A	Sharon silt loam, 0 to 2 percent slopes, frequently flooded	842	0.2
3108A	Bonnie silt loam, 0 to 2 percent slopes, frequently flooded	31	*
3108T	Bonnie silt loam, sodic, 0 to 2 percent slopes, frequently flooded	3,081	0.8
3225A	Holton silt loam, 0 to 2 percent slopes, frequently flooded	9,626	2.6
3226A	Wirt silt loam, 0 to 2 percent slopes, frequently flooded	2,036	0.6
3333A	Wakeland silt loam, 0 to 2 percent slopes, frequently flooded	7,961	2.2
3334A	Birds silt loam, 0 to 2 percent slopes, frequently flooded	2,498	0.7
3382A	Belknap silt loam, 0 to 2 percent slopes, frequently flooded	5,779	1.6
3415A	Orion silt loam, 0 to 2 percent slopes, frequently flooded	1,253	0.3
7337B	Creal silt loam, 2 to 5 percent slopes, rarely flooded	932	0.3
8787A	Banlic silt loam, 0 to 2 percent slopes, occasionally flooded	2,284	0.6
M-W	Miscellaneous water	45	*
W	Water	3,301	0.9
	Total	368,685	100.0

* Less than 0.1 percent.

Table 6.--Limitations and Hazards Affecting Cropland and Pastureland

(See text for a description of the limitations and hazards listed in this table. Only the soils that are generally available for use as cropland or pastureland are listed. Dashes indicate that the soil is generally not suited to use as cropland or pastureland)

Map symbol and soil name	Limitations and hazards affecting cropland	Limitations and hazards affecting pastureland
2A:		
Cisne	Ponding, restricted permeability, wetness	Ponding, low pH, frost heave, wetness
3A:		
Hoyleton	Wetness, crusting, restricted permeability	Wetness, low pH
3B:		
Hoyleton	Wetness, crusting, water erosion, restricted permeability	Wetness, low pH, water erosion
3B2:		
Hoyleton	Wetness, crusting, water erosion, restricted permeability	Wetness, low pH, water erosion
4B:		
Richview	None	Low pH
4C2:		
Richview	Crusting, water erosion	Low pH, water erosion
5C3:		
Blair	Wetness, poor tilth, crusting, water erosion	Wetness, poor tilth, low pH, water erosion, low fertility
7C2:		
Atlas	Wetness, crusting, water erosion, restricted permeability	Wetness, low pH, water erosion
7C3:		
Atlas	Wetness, poor tilth, crusting, water erosion, restricted permeability	Wetness, poor tilth, low pH, water erosion, low fertility
7D2:		
Atlas	Wetness, crusting, water erosion, restricted permeability	Wetness, low pH, water erosion
7D3:		
Atlas	Wetness, poor tilth, crusting, water erosion, restricted permeability	Wetness, poor tilth, low pH, water erosion, low fertility
8D3:		
Hickory	Poor tilth, crusting, water erosion	Poor tilth, low pH, water erosion, low fertility
8F:		
Hickory	---	Equipment limitation, low pH, water erosion

Table 6.--Limitations and Hazards Affecting Cropland and Pastureland--Continued

Map symbol and soil name	Limitations and hazards affecting cropland	Limitations and hazards affecting pastureland
8G:		
Hickory------------------	---	---
10C:		
Plumfield----------------	Root-restrictive layer, poor tilth, crusting, water erosion, restricted permeability	Root-restrictive layer, poor tilth, low pH, water erosion,*** low fertility
12A:		
Wynoose------------------	Ponding, low pH, restricted permeability, wetness	Ponding, low pH, frost heave, wetness
13A:		
Bluford------------------	Wetness, root-restrictive layer, restricted permeability	Wetness, root-restrictive layer, low pH
13B:		
Bluford------------------	Wetness, root-restrictive layer, water erosion, restricted permeability	Wetness, root-restrictive layer, low pH, water erosion
13B2:		
Bluford------------------	Wetness, root-restrictive layer, crusting, water erosion, restricted permeability	Wetness, root-restrictive layer, low pH, water erosion
14B:		
Ava----------------------	Root-restrictive layer, water erosion, restricted permeability	Root-restrictive layer, low pH, water erosion
14C2:		
Ava----------------------	Root-restrictive layer, crusting, water erosion, restricted permeability	Root-restrictive layer, low pH, water erosion
15B2:		
Parke--------------------	Crusting, water erosion	Low pH, water erosion
109A:		
Racoon-------------------	Ponding, crusting, restricted permeability, wetness	Ponding, low pH, frost heave, wetness
120A:		
Huey---------------------	Ponding, high pH, excess sodium, restricted permeability, wetness, root-restrictive layer	Ponding, high pH, excess sodium, frost heave, wetness, root-restrictive layer
218A:		
Newberry-----------------	Ponding, restricted permeability, wetness	Ponding, low pH, frost heave, wetness
421G:		
Kell---------------------	---	---

Table 6.--Limitations and Hazards Affecting Cropland and Pastureland--Continued

Map symbol and soil name	Limitations and hazards affecting cropland	Limitations and hazards affecting pastureland
551D2:		
Gosport	Low pH, crusting, water erosion, restricted permeability, depth to bedrock	Low pH, water erosion, depth to bedrock
551F:		
Gosport	---	Equipment limitation, low pH, water erosion, depth to bedrock
551G:		
Gosport	---	---
581A:		
Tamalco	Crusting, excess sodium, high pH, restricted permeability, root-restrictive layer	Excess sodium, high pH, root-restrictive layer
652C2:		
Passport	Wetness, crusting, water erosion, restricted permeability	Wetness, low pH, water erosion
652D2:		
Passport	Wetness, crusting, water erosion, restricted permeability	Wetness, low pH, water erosion
801B:		
Orthents	---	---
888C2:		
Passport	Wetness, crusting, water erosion, restricted permeability	Wetness, low pH, water erosion
Grantfork	Wetness, high pH, crusting, water erosion, restricted permeability	Wetness, high pH, water erosion
908D2:		
Hickory	Water erosion	Low pH, water erosion
Kell	Low pH, water erosion, limited available water capacity, restricted permeability, depth to bedrock	Low pH, water erosion, limited available water capacity, depth to bedrock
908F:		
Hickory	---	Equipment limitation, low pH, water erosion
Kell	---	Equipment limitation, low pH, water erosion, depth to bedrock

Table 6.--Limitations and Hazards Affecting Cropland and Pastureland--Continued

Map symbol and soil name	Limitations and hazards affecting cropland	Limitations and hazards affecting pastureland
912A:		
Hoyleton	Wetness, crusting, restricted permeability	Wetness, low pH
Darmstadt	Wetness, root-restrictive layer, crusting, excess sodium, high pH, restricted permeability	Wetness, root-restrictive layer, excess sodium, high pH
912B:		
Hoyleton	Wetness, crusting, water erosion, restricted permeability	Wetness, low pH, water erosion
Darmstadt	Wetness, root-restrictive layer, high pH, crusting, water erosion, excess sodium, restricted permeability	Wetness, root-restrictive layer, high pH, water erosion, excess sodium
912B2:		
Hoyleton	Wetness, crusting, water erosion, restricted permeability	Wetness, low pH, water erosion
Darmstadt	Wetness, high pH, crusting, water erosion, excess sodium, restricted permeability, root-restrictive layer	Wetness, high pH, water erosion, excess sodium, root-restrictive layer
914C2:		
Atlas	Wetness, crusting, water erosion, restricted permeability	Wetness, low pH, water erosion
Grantfork	Wetness, crusting, water erosion, high pH, restricted permeability	Wetness, water erosion, high pH
929D2:		
Ava	Root-restrictive layer, crusting, water erosion, restricted permeability	Root-restrictive layer, low pH, water erosion
Hickory	Crusting, water erosion	Low pH, water erosion
947D2:		
Hickory	Crusting, water erosion	Low pH, water erosion
Passport	Wetness, crusting, water erosion, restricted permeability	Wetness, low pH, water erosion
947D3:		
Hickory	Poor tilth, crusting, water erosion	Poor tilth, low pH, water erosion, low fertility
Passport	Wetness, poor tilth, crusting, water erosion, restricted permeability	Wetness, poor tilth, low pH, water erosion, low fertility

Table 6.--Limitations and Hazards Affecting Cropland and Pastureland--Continued

Map symbol and soil name	Limitations and hazards affecting cropland	Limitations and hazards affecting pastureland
967F:		
Hickory	---	Equipment limitation, low pH, water erosion
Gosport	---	Equipment limitation, low pH, water erosion, depth to bedrock
991A:		
Cisne	Ponding, restricted permeability, wetness	Ponding, low pH, frost heave, wetness
Huey	Ponding, high pH, excess sodium, restricted permeability, wetness, root-restrictive layer	Ponding, high pH, excess sodium, frost heave, wetness, root-restrictive layer
1524A:		
Zipp	---	Flooding, ponding, poor tilth, limited available water capacity, frost heave, wetness
3072A:		
Sharon	Flooding	Flooding, low pH
3108A:		
Bonnie	Flooding, ponding, crusting, wetness	Flooding, ponding, low pH, frost heave, wetness
3108T:		
Bonnie	Flooding, ponding, crusting, restricted permeability, wetness	Flooding, ponding, low pH, frost heave, wetness
3225A:		
Holton	Flooding, wetness	Flooding, wetness
3226A:		
Wirt	Flooding	Flooding
3333A:		
Wakeland	Flooding, wetness	Flooding, wetness
3334A:		
Birds	Flooding, ponding, crusting, wetness	Flooding, ponding, frost heave, wetness
3382A:		
Belknap	Flooding, wetness	Flooding, wetness, low pH
3415A:		
Orion	Flooding, wetness	Flooding, wetness
7337B:		
Creal	Wetness, crusting, water erosion	Wetness, low pH
8787A:		
Banlic	Flooding, wetness, root-restrictive layer, restricted permeability	Flooding, wetness, root-restrictive layer, low pH

Table 7.--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	Grass-legume hay	Grass-legume pasture
		Bu	Bu	Bu	Tons	AUM*
2A:						
Cisne	3w	135	41	53	4.18	6.17
3A:						
Hoyleton	2w	132	42	52	4.18	6.17
3B:						
Hoyleton	2e	131	42	51	4.14	6.10
3B2:						
Hoyleton	2e	125	40	49	3.97	5.86
4B:						
Richview	2e	136	43	53	3.47	5.12
4C2:						
Richview	3e	127	40	50	3.26	4.75
5C3:						
Blair	3e	107	34	43	3.41	4.90
7C2:						
Atlas	3e	95	33	38	2.84	4.11
7C3:						
Atlas	3e	78	27	31	2.34	3.36
7D2:						
Atlas	4e	90	30	35	2.65	3.78
7D3:						
Atlas	4e	73	25	28	2.12	2.99
8D3:						
Hickory	4e	86	29	35	2.86	4.00
8F:						
Hickory	6e	---	---	---	2.64	3.84
8G:						
Hickory	7e	---	---	---	---	2.51
10C:						
Plumfield	4s	93	31	36	3.07	4.48
12A:						
Wynoose	3w	115	38	46	3.84	5.67
13A:						
Bluford	2w	122	40	50	3.05	4.50
13B:						
Bluford	2e	120	39	49	3.02	4.45

See footnote at end of table.

Table 7.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Grass-legume hay	Grass-legume pasture
		Bu	Bu	Bu	Tons	AUM*
13B2:						
Bluford-------------	2e	116	38	48	2.90	4.28
14B:						
Ava-----------------	2e	120	39	50	2.91	4.24
14C2:						
Ava-----------------	3e	108	35	45	2.62	3.77
15B2:						
Parke---------------	2e	131	41	50	3.10	4.59
109A:						
Racoon--------------	3w	130	41	51	3.50	5.17
120A:						
Huey----------------	3w	98	38	38	3.16	4.67
218A:						
Newberry------------	2w	139	44	54	4.29	6.33
421G:						
Kell----------------	7e	---	---	---	---	2.43
533:						
Urban land----------	8	---	---	---	---	---
551D2:						
Gosport-------------	4e	85	29	35	2.65	3.83
551F:						
Gosport-------------	6e	---	---	---	2.40	3.60
551G:						
Gosport-------------	7e	---	---	---	---	2.05
581A:						
Tamalco-------------	3s	105	39	43	3.16	4.67
652C2:						
Passport------------	3e	105	35	47	3.47	5.06
652D2:						
Passport------------	4e	97	33	43	3.21	4.62
801B:						
Orthents------------	2e	---	---	---	---	---
810.						
Oil-waste land						
888C2----------------	3e	99	34	41	3.13	4.54
Passport-Grantfork						
908D2----------------	4e	95	32	38	3.10	4.46
Hickory-Kell						
908F-----------------	6e	---	---	---	2.66	3.87
Hickory-Kell						

See footnote at end of table.

Table 7.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Grass-legume hay	Grass-legume pasture
		Bu	Bu	Bu	Tons	AUM*
912A		121	41	47	3.80	5.60
Hoyleton	2w					
Darmstadt	3s					
912B		120	41	46	3.74	5.50
Hoyleton	2e					
Darmstadt	3s					
912B2		114	38	44	3.56	5.21
Hoyleton	2e					
Darmstadt	3s					
914C2 Atlas-Grantfork	3e	93	33	36	2.76	3.98
929D2 Ava-Hickory	4e	97	32	40	2.70	3.90
947D2 Hickory-Passport	4e	96	32	40	3.18	4.57
947D3 Hickory-Passport	4e	88	29	37	2.90	4.01
967F Hickory-Gosport	6e	---	---	---	2.53	3.65
991A Cisne-Huey	3w	118	40	46	3.72	5.49
1524A:						
Zipp	5w	---	---	---	2.69	3.97
3072A:						
Sharon	3w	133	43	---	3.86	5.70
3108A:						
Bonnie	3w	121	40	---	3.76	5.60
3108T:						
Bonnie	3w	121	40	---	3.76	5.60
3225A:						
Holton	3w	110	35	---	3.46	5.10
3226A:						
Wirt	3w	118	38	---	2.80	4.20
3333A:						
Wakeland	3w	141	46	---	4.17	6.15
3334A:						
Birds	3w	127	41	50	3.97	5.90
3382A:						
Belknap	3w	127	42	---	3.97	5.85
3415A:						
Orion	3w	130	42	---	3.10	4.60

See footnote at end of table.

Table 7.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Grass-legume hay	Grass-legume pasture
		Bu	Bu	Bu	Tons	AUM*
7337B:						
Creal	2e	135	43	52	3.58	5.28
8787A:						
Banlic	3s	128	42	51	4.18	6.17

* Animal unit month: The amount of forage required to feed one mature cow, of approximately 1,000 pounds weight, with or without a calf, for 30 days.

Table 8.--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
2A	Cisne silt loam, 0 to 2 percent slopes (where drained)
3A	Hoyleton silt loam, 0 to 2 percent slopes
3B	Hoyleton silt loam, 2 to 5 percent slopes
3B2	Hoyleton silt loam, 2 to 5 percent slopes, eroded
4B	Richview silt loam, 2 to 5 percent slopes
13A	Bluford silt loam, 0 to 2 percent slopes (where drained)
13B	Bluford silt loam, 2 to 5 percent slopes
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded
14B	Ava silt loam, 2 to 5 percent slopes
15B2	Parke silt loam, 2 to 5 percent slopes, eroded
109A	Racoon silt loam, 0 to 2 percent slopes (where drained)
218A	Newberry silt loam, 0 to 2 percent slopes (where drained)
3072A	Sharon silt loam, 0 to 2 percent slopes, frequently flooded (where protected from flooding or not frequently flooded during the growing season)
3108A	Bonnie silt loam, 0 to 2 percent slopes, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
3108T	Bonnie silt loam, sodic, 0 to 2 percent slopes, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
3225A	Holton silt loam, 0 to 2 percent slopes, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
3226A	Wirt silt 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)
3334A	Birds silt loam, 0 to 2 percent slopes, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
3382A	Belknap silt loam, 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 protected from flooding or not frequently flooded during the growing season)
7337B	Creal silt loam, 2 to 5 percent slopes, rarely flooded (where drained)
8787A	Banlic silt loam, 0 to 2 percent slopes, occasionally flooded (where drained)

Table 9.--Hydric Soils

(Only those map units that have hydric components are listed. See text for a description of hydric qualities and definitions of the codes in the hydric criteria column)

Map symbol and map unit name	Component	Hydric status	Local landform	Hydric criteria
2A:				
Cisne silt loam, 0 to 2 percent slopes	Cisne	Hydric	ground moraine, till plain	2B3
	Huey	Hydric	depression	2B3
3A:				
Hoyleton silt loam, 0 to 2 percent slopes	Hoyleton	Not hydric	ground moraine, till plain	---
	Cisne	Hydric	swale	2B3
	Huey	Hydric	depression	2B3
3B:				
Hoyleton silt loam, 2 to 5 percent slopes	Hoyleton	Not hydric	ground moraine, till plain	---
	Cisne	Hydric	swale	2B3
	Huey	Hydric	depression	2B3
3B2:				
Hoyleton silt loam, 2 to 5 percent slopes, eroded	Hoyleton	Not hydric	ground moraine, till plain	---
	Cisne	Hydric	swale	2B3
	Huey	Hydric	depression	2B3
4B:				
Richview silt loam, 2 to 5 percent slopes	Richview	Not hydric	esker, till plain	---
	Cisne	Hydric	swale	2B3
7C2:				
Atlas silt loam, 5 to 10 percent slopes, eroded	Atlas	Not hydric	till plain	---
	Wynoose	Hydric	swale	2B3
7C3:				
Atlas silt loam, 5 to 10 percent slopes, severely eroded	Atlas	Not hydric	till plain	---
	Wynoose	Hydric	swale	2B3
12A:				
Wynoose silt loam, 0 to 2 percent slopes	Wynoose	Hydric	ground moraine, till plain	2B3
13A:				
Bluford silt loam, 0 to 2 percent slopes	Bluford	Not hydric	ground moraine, till plain	---
	Wynoose	Hydric	swale	2B3
	Cisne	Hydric	swale	2B3

Table 9.--Hydric Soils--Continued

Map symbol and map unit name	Component	Hydric status	Local landform	Hydric criteria
13B:				
Bluford silt loam, 2 to 5 percent slopes	Bluford	Not hydric	ground moraine, till plain	---
	Wynoose	Hydric	flat	2B3
	Cisne	Hydric	swale	2B3
13B2:				
Bluford silt loam, 2 to 5 percent slopes, eroded	Bluford	Not hydric	ground moraine, till plain	---
	Wynoose	Hydric	flat	2B3
	Cisne	Hydric	swale	2B3
14B:				
Ava silt loam, 2 to 5 percent slopes	Ava	Not hydric	till plain	---
	Wynoose	hydric	swale	2B3
14C2:				
Ava silt loam, 5 to 10 percent slopes, eroded	Ava	Not hydric	till plain	---
	Wynoose	hydric	swale	2B3
109A:				
Racoon silt loam, 0 to 2 percent slopes	Racoon	Hydric	depression, till plain	2B3
120A:				
Huey silt loam, 0 to 2 percent slopes	Huey	Hydric	depression, till plain, ground moraine	2B3
	Cisne	Hydric	flat	2B3
	Wynoose	Hydric	flat	2B3
218A:				
Newberry silt loam, 0 to 2 percent slopes	Newberry	Hydric	depression, flat	2B3
888C2:				
Passport-Grantfork silt loams, 5 to 10 percent slopes, eroded	Passport	Not hydric	till plain	---
	Grantfork	Not hydric	till plain	---
	Cisne	Hydric	swale	2B3
912A:				
Hoyleton-Darmstadt silt loams, 0 to 2 percent slopes	Hoyleton	Not hydric	ground moraine, till plain	---
	Darmstadt	Not hydric	till plain	---
	Cisne	Hydric	flat	2B3
	Huey	Hydric	depression	2B3
912B:				
Hoyleton-Darmstadt silt loams, 2 to 5 percent slopes	Hoyleton	Not hydric	ground moraine, till plain	---
	Darmstadt	Not hydric	till plain	---
	Cisne	Hydric	flat	2B3
	Huey	Hydric	depression	2B3

Table 9.--Hydric Soils--Continued

Map symbol and map unit name	Component	Hydric status	Local landform	Hydric criteria
912B2:				
Hoyleton-Darmstadt silt loams, 2 to 5 percent slopes, eroded	Hoyleton	Not hydric	ground moraine, till plain	---
	Darmstadt	Not hydric	till plain	---
	Cisne	Hydric	flat	2B3
	Huey	Hydric	flat	2B3
914C2:				
Atlas-Grantfork silt loams, 5 to 10 percent slopes, eroded	Atlas	Not hydric	till plain	---
	Grantfork	Not hydric	till plain	---
	Cisne	Hydric	flat	2B3
991A:				
Cisne-Huey silt loams, 0 to 2 percent slopes	Cisne	Hydric	ground moraine, till plain	2B3
	Huey	Hydric	depression, till plain, ground moraine	2B3
1524A:				
Zipp silty clay loam, undrained, 0 to 2 percent slopes, frequently flooded	Zipp	Hydric	depression, flood plain	2B3,3,4
3108A:				
Bonnie silt loam, 0 to 2 percent slopes, frequently flooded	Bonnie	Hydric	flood plain	2B3
3108T:				
Bonnie silt loam, sodic, 0 to 2 percent slopes, frequently flooded	Bonnie	Hydric	flood plain	2B3
3225A:				
Holton silt loam, 0 to 2 percent slopes, frequently flooded	Holton	Not hydric	flood plain	---
	Birds	Hydric	swale	4,2B3
3333A:				
Wakeland silt loam, 0 to 2 percent slopes, frequently flooded	Wakeland	Not hydric	flood plain, flood-plain step	---
	Birds	Hydric	swale	2B3,4
3334A:				
Birds silt loam, 0 to 2 percent slopes, frequently flooded	Birds	Hydric	flood plain	2B3,4
3382A:				
Belknap silt loam, 0 to 2 percent slopes, frequently flooded	Belknap	Not hydric	flood plain	---
	Bonnie	Hydric	depression	2B3

Table 9.--Hydric Soils--Continued

Map symbol and map unit name	Component	Hydric status	Local landform	Hydric criteria
3415A:				
Orion silt loam, 0 to 2 percent slopes, frequently flooded	Orion	Not hydric	flood plain	---
	Birds	Hydric	oxbow	2B3,4
8787A:				
Banlic silt loam, 0 to 2 percent slopes, occasionally flooded	Banlic	Not hydric	flood-plain step, stream terrace	---
	Birds	Hydric	depression	4,2B3
	Bonnie	Hydric	depression	2B3

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
2A:					
Cisne	American cranberrybush, black chokeberry, buttonbush, common elderberry, common ninebark, common winterberry, gray dogwood, highbush blueberry, northern spicebush, redosier dogwood, silky dogwood	Cockspur hawthorn, hazel alder, nannyberry, roughleaf dogwood	Arborvitae, blackgum, common hackberry, green hawthorn, northern white-cedar, shingle oak	Red maple, river birch, swamp white oak, sweetgum	Carolina poplar, eastern cottonwood, pin oak
3A:					
Hoyleton	American cranberrybush, Canada yew, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, northern spicebush, redosier dogwood, silky dogwood	Blackhaw, cockspur hawthorn, common pawpaw, common serviceberry, prairie crabapple, roughleaf dogwood, rusty blackhaw, southern arrowwood, witchhazel	Austrian pine, Douglas fir, arborvitae, blue spruce, common persimmon, eastern redcedar, green hawthorn, nannyberry, pecan, shingle oak	Norway spruce, blackgum, common hackberry, red maple, swamp white oak, sweetgum	Carolina poplar, eastern cottonwood, pin oak
3B:					
Hoyleton	American cranberrybush, Canada yew, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, northern spicebush, redosier dogwood, silky dogwood	Blackhaw, cockspur hawthorn, common pawpaw, common serviceberry, prairie crabapple, roughleaf dogwood, rusty blackhaw, southern arrowwood, witchhazel	Austrian pine, Douglas fir, arborvitae, blue spruce, common persimmon, eastern redcedar, green hawthorn, nannyberry, pecan, shingle oak	Norway spruce, blackgum, common hackberry, red maple, swamp white oak, sweetgum	Carolina poplar, 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
3B2:					
Hoyleton	American cranberrybush, Canada yew, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, northern spicebush, redosier dogwood, silky dogwood	Blackhaw, cockspur hawthorn, common pawpaw, common serviceberry, prairie crabapple, roughleaf dogwood, rusty blackhaw, southern arrowwood, witchhazel	Austrian pine, Douglas fir, arborvitae, blue spruce, common persimmon, eastern redcedar, green hawthorn, nannyberry, pecan, shingle oak	Norway spruce, blackgum, common hackberry, red maple, swamp white oak, sweetgum	Carolina poplar, eastern cottonwood, pin oak
4B:					
Richview	American hazelnut, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, coralberry, mapleleaf viburnum, redosier dogwood, silky dogwood	American plum, American witchhazel, blackhaw, common chokecherry, common serviceberry, prairie crabapple, roughleaf dogwood, smooth sumac, southern arrowwood	Washington hawthorn, arborvitae, blue spruce, common persimmon, eastern redcedar, nannyberry, pecan, white oak	Douglas fir, Norway spruce, black walnut, blackgum, common hackberry, northern red oak, pin oak, tuliptree	Carolina poplar, eastern cottonwood, eastern white pine
4C2:					
Richview	American hazelnut, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, coralberry, mapleleaf viburnum, redosier dogwood, silky dogwood	American plum, American witchhazel, blackhaw, common chokecherry, common serviceberry, prairie crabapple, roughleaf dogwood, smooth sumac, southern arrowwood	Washington hawthorn, arborvitae, blue spruce, common persimmon, eastern redcedar, nannyberry, pecan, white oak	Douglas fir, Norway spruce, black walnut, blackgum, common hackberry, northern red oak, pin oak, tuliptree	Carolina poplar, eastern cottonwood, eastern white pine
5C3:					
Blair	American cranberrybush, Canada yew, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, northern spicebush, redosier dogwood, silky dogwood	Blackhaw, cockspur hawthorn, common pawpaw, common serviceberry, prairie crabapple, roughleaf dogwood, rusty blackhaw, southern arrowwood, witchhazel	Austrian pine, Douglas fir, arborvitae, blue spruce, common persimmon, eastern redcedar, green hawthorn, nannyberry, pecan, shingle oak	Norway spruce, blackgum, common hackberry, red maple, swamp white oak, sweetgum	Carolina poplar, 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
7C2:					
Atlas	American plum, black chokeberry, blackhaw, common juniper, gray dogwood, mapleleaf viburnum	Cockspur hawthorn, common serviceberry, eastern redcedar, nannyberry, prairie crabapple	Bur oak, chinkapin oak, thornless honeylocust	---	---
7C3:					
Atlas	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Virginia pine, arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar	Norway spruce	Carolina poplar
7D2:					
Atlas	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Virginia pine, arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar	Norway spruce	Carolina poplar
7D3:					
Atlas	American plum, black chokeberry, blackhaw, common juniper, gray dogwood, mapleleaf viburnum	Cockspur hawthorn, common serviceberry, eastern redcedar, nannyberry, prairie crabapple	Bur oak, chinkapin oak, 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
8D3: Hickory	American hazelnut, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, coralberry, mapleleaf viburnum, redosier dogwood, silky dogwood	American plum, American witchhazel, blackhaw, common chokecherry, common serviceberry, prairie crabapple, roughleaf dogwood, smooth sumac, southern arrowwood	Washington hawthorn, arborvitae, blue spruce, common persimmon, eastern redcedar, nannyberry, pecan, white oak	Douglas fir, Norway spruce, black walnut, blackgum, common hackberry, northern red oak, pin oak, tuliptree	Carolina poplar, eastern cottonwood, eastern white pine
8F: Hickory	American hazelnut, black chokeberry, common winterberry, coralberry, gray dogwood, mapleleaf viburnum	American plum, American witchhazel, Arnold hawthorn, blackhaw, common chokecherry, common serviceberry, prairie crabapple	Douglas fir, arborvitae, blackgum, blue spruce, bur oak, eastern redcedar, pecan	Norway spruce, common hackberry, pin oak, tuliptree	Carolina poplar, eastern white pine
8G: Hickory	American hazelnut, black chokeberry, common winterberry, coralberry, gray dogwood, mapleleaf viburnum	American plum, American witchhazel, Arnold hawthorn, blackhaw, common chokecherry, common serviceberry, prairie crabapple	Douglas fir, arborvitae, black walnut, blackgum, blue spruce, bur oak, eastern redcedar, pecan	Norway spruce, common hackberry, pin oak, tuliptree	Carolina poplar, eastern white pine
10C: Plumfield	American plum, black chokeberry, blackhaw, common juniper, gray dogwood, mapleleaf viburnum	Cockspur hawthorn, common serviceberry, eastern redcedar, nannyberry, prairie crabapple	Bur oak, chinkapin oak, 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
12A:					
Wynoose	American cranberrybush, black chokeberry, buttonbush, common elderberry, common ninebark, common winterberry, gray dogwood, highbush blueberry, northern spicebush, redosier dogwood, silky dogwood	Cockspur hawthorn, hazel alder, nannyberry, roughleaf dogwood	Arborvitae, blackgum, common hackberry, green hawthorn, northern white-cedar, shingle oak	Red maple, river birch, swamp white oak, sweetgum	Carolina poplar, eastern cottonwood, pin oak
13A:					
Bluford	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Virginia pine, arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar	Norway spruce	Carolina poplar
13B:					
Bluford	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Virginia pine, arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar	Norway spruce	Carolina poplar

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
13B2:					
Bluford	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Virginia pine, arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar	Norway spruce	Carolina poplar
14B:					
Ava	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Virginia pine, arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar	Norway spruce	Carolina poplar
14C2:					
Ava	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Virginia pine, arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar	Norway spruce	Carolina poplar

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
15B2:					
Parke	American hazelnut, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, coralberry, highbush cranberry, redosier dogwood, silky dogwood	American plum, American witchhazel, blackhaw, common chokecherry, common serviceberry, prairie crabapple, roughleaf dogwood, smooth sumac, southern arrowwood	Washington hawthorn, arborvitae, blue spruce, common persimmon, eastern redcedar, nannyberry, pecan, white oak	Douglas fir, Norway spruce, black walnut, blackgum, common hackberry, northern red oak, pin oak, tuliptree	Carolina poplar, eastern cottonwood, eastern white pine
109A:					
Racoon	American cranberrybush, black chokeberry, buttonbush, common elderberry, common ninebark, common winterberry, gray dogwood, highbush blueberry, northern spicebush, redosier dogwood, silky dogwood	Cockspur hawthorn, hazel alder, nannyberry, roughleaf dogwood	Arborvitae, blackgum, common hackberry, green hawthorn, northern white-cedar, shingle oak	Red maple, river birch, swamp white oak, sweetgum	Carolina poplar, eastern cottonwood, pin oak
120A:					
Huey	Common juniper	American hazelnut, common serviceberry, common winterberry, eastern redcedar, prairie crabapple	Douglas fir, blue spruce, eastern white pine	---	---
218A:					
Newberry	American cranberrybush, black chokeberry, buttonbush, common elderberry, common ninebark, common winterberry, gray dogwood, highbush blueberry, northern spicebush, redosier dogwood, silky dogwood	Cockspur hawthorn, hazel alder, nannyberry, roughleaf dogwood	Arborvitae, blackgum, common hackberry, green hawthorn, northern white-cedar, shingle oak	Red maple, river birch, swamp white oak, sweetgum	Carolina poplar, 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
421G:					
Kell	American cranberrybush, American hazelnut, black chokeberry, common chokecherry, common elderberry, common juniper, coralberry, mapleleaf viburnum, silky dogwood	American plum, bur oak, chinkapin oak, common serviceberry, eastern redcedar, nannyberry, prairie crabapple, roughleaf dogwood, smooth sumac	Black oak, common hackberry, eastern white pine	Carolina poplar	---
533. Urban land					
551D2:					
Gosport	American cranberrybush, American hazelnut, black chokeberry, common chokecherry, common elderberry, common juniper, coralberry, mapleleaf viburnum, silky dogwood	American plum, bur oak, chinkapin oak, common serviceberry, eastern redcedar, nannyberry, prairie crabapple, roughleaf dogwood, smooth sumac	Black oak, common hackberry, eastern white pine	Carolina poplar	---
551F:					
Gosport	American cranberrybush, American hazelnut, black chokeberry, common chokecherry, common elderberry, common juniper, coralberry, mapleleaf viburnum, silky dogwood	American plum, bur oak, chinkapin oak, common serviceberry, eastern redcedar, nannyberry, prairie crabapple, roughleaf dogwood, smooth sumac	Black oak, common hackberry, eastern white pine	Carolina poplar	---
551G:					
Gosport	American cranberrybush, American hazelnut, black chokeberry, common chokecherry, common elderberry, common juniper, coralberry, mapleleaf viburnum, silky dogwood	American plum, bur oak, chinkapin oak, common serviceberry, eastern redcedar, nannyberry, prairie crabapple, roughleaf dogwood, smooth sumac	Black oak, common hackberry, eastern white pine	Carolina poplar	---

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
581A:					
Tamalco	Common juniper	American hazelnut, common serviceberry, common winterberry, eastern redcedar, prairie crabapple	Douglas fir, blue spruce, eastern white pine	---	---
652C2:					
Passport	American plum, black chokeberry, blackhaw, common juniper, gray dogwood, mapleleaf viburnum	Cockspur hawthorn, common serviceberry, eastern redcedar, nannyberry, prairie crabapple	Bur oak, chinkapin oak, thornless honeylocust	---	---
652D2:					
Passport	American plum, black chokeberry, blackhaw, common juniper, gray dogwood, mapleleaf viburnum	Cockspur hawthorn, common serviceberry, eastern redcedar, nannyberry, prairie crabapple	Bur oak, chinkapin oak, thornless honeylocust	---	---
801B:					
Orthents	Common winterberry, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood	Eastern redcedar, nannyberry, shadbush, tamarack, northern white-cedar	Baldcypress, common hackberry, tuliptree, Norway spruce	Eastern cottonwood, eastern white pine, pin oak
810.					
Oil-waste land					
888C2:					
Passport	American plum, black chokeberry, blackhaw, common juniper, gray dogwood, mapleleaf viburnum	Cockspur hawthorn, common serviceberry, eastern redcedar, nannyberry, prairie crabapple	Bur oak, chinkapin oak, thornless honeylocust	---	---
Grantfork	American plum, black chokeberry, blackhaw, common juniper, gray dogwood, mapleleaf viburnum	Cockspur hawthorn, common serviceberry, eastern redcedar, nannyberry, prairie crabapple	Bur oak, chinkapin oak, 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
908D2:					
Hickory	American hazelnut, black chokeberry, common winterberry, coralberry, gray dogwood, mapleleaf viburnum	American plum, American witchhazel, Arnold hawthorn, blackhaw, common chokecherry, common serviceberry, prairie crabapple	Douglas fir, arborvitae, black walnut, blackgum, blue spruce, bur oak, eastern redcedar, pecan	Norway spruce, common hackberry, pin oak, tuliptree	Carolina poplar, eastern white pine
Kell	American cranberrybush, American hazelnut, black chokeberry, common chokecherry, common elderberry, common juniper, coralberry, mapleleaf viburnum, silky dogwood	American plum, bur oak, chinkapin oak, common serviceberry, eastern redcedar, nannyberry, prairie crabapple, roughleaf dogwood, smooth sumac	Black oak, common hackberry, eastern white pine	Carolina poplar	---
908F:					
Hickory	American hazelnut, black chokeberry, common winterberry, coralberry, gray dogwood, mapleleaf viburnum	American plum, American witchhazel, Arnold hawthorn, blackhaw, common chokecherry, common serviceberry, prairie crabapple	Douglas fir, arborvitae, black walnut, blackgum, blue spruce, bur oak, eastern redcedar, pecan	Norway spruce, common hackberry, pin oak, tuliptree	Carolina poplar, eastern white pine
Kell	American cranberrybush, American hazelnut, black chokeberry, common chokecherry, common elderberry, common juniper, coralberry, mapleleaf viburnum, silky dogwood	American plum, bur oak, chinkapin oak, common serviceberry, eastern redcedar, nannyberry, prairie crabapple, roughleaf dogwood, smooth sumac	Black oak, common hackberry, eastern white pine	Carolina poplar	---

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
912A:					
Hoyleton	American cranberrybush, Canada yew, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, northern spicebush, redosier dogwood, silky dogwood	Blackhaw, cockspur hawthorn, common pawpaw, common serviceberry, prairie crabapple, roughleaf dogwood, rusty blackhaw, southern arrowwood, witchhazel	Austrian pine, Douglas fir, arborvitae, blue spruce, common persimmon, eastern redcedar, green hawthorn, nannyberry, pecan, shingle oak	Norway spruce, blackgum, common hackberry, red maple, swamp white oak, sweetgum	Carolina poplar, eastern cottonwood, pin oak
Darmstadt	Common juniper	American hazelnut, common serviceberry, common winterberry, eastern redcedar, prairie crabapple	Douglas fir, blue spruce, eastern white pine	---	---
912B:					
Hoyleton	American cranberrybush, Canada yew, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, northern spicebush, redosier dogwood, silky dogwood	Blackhaw, cockspur hawthorn, common pawpaw, common serviceberry, prairie crabapple, roughleaf dogwood, rusty blackhaw, southern arrowwood, witchhazel	Austrian pine, Douglas fir, arborvitae, blue spruce, common persimmon, eastern redcedar, green hawthorn, nannyberry, pecan, shingle oak	Norway spruce, blackgum, common hackberry, red maple, swamp white oak, sweetgum	Carolina poplar, eastern cottonwood, pin oak
Darmstadt	Common juniper	American hazelnut, common serviceberry, common winterberry, eastern redcedar, prairie crabapple	Douglas fir, blue spruce, 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
912B2:					
Hoyleton	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Virginia pine, arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar	Norway spruce	Carolina poplar
Darmstadt	Common juniper	American hazelnut, common serviceberry, common winterberry, eastern redcedar, prairie crabapple	Douglas fir, blue spruce, eastern white pine	---	---
914C2:					
Atlas	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Virginia pine, arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar	Norway spruce	Carolina poplar
Grantfork	American plum, black chokeberry, blackhaw, common juniper, gray dogwood, mapleleaf viburnum	Cockspur hawthorn, common serviceberry, eastern redcedar, nannyberry, prairie crabapple	Bur oak, chinkapin oak, 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
929D2:					
Ava	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Virginia pine, arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar	Norway spruce	Carolina poplar
Hickory	American hazelnut, black chokeberry, common winterberry, coralberry, gray dogwood, mapleleaf viburnum	American plum, American witchhazel, Arnold hawthorn, blackhaw, common chokecherry, common serviceberry, prairie crabapple	Douglas fir, arborvitae, black walnut, blackgum, blue spruce, bur oak, eastern redcedar, pecan	Norway spruce, common hackberry, pin oak, tuliptree	Carolina poplar, eastern white pine
947D2:					
Hickory	American hazelnut, black chokeberry, common winterberry, coralberry, gray dogwood, mapleleaf viburnum	American plum, American witchhazel, Arnold hawthorn, blackhaw, common chokecherry, common serviceberry, prairie crabapple	Douglas fir, arborvitae, black walnut, blackgum, blue spruce, bur oak, eastern redcedar, pecan	Norway spruce, common hackberry, pin oak, tuliptree	Carolina poplar, eastern white pine
Passport	American plum, black chokeberry, blackhaw, common juniper, gray dogwood, mapleleaf viburnum	Cockspur hawthorn, common serviceberry, eastern redcedar, nannyberry, prairie crabapple	Bur oak, chinkapin oak, thornless honeylocust	---	---
947D3:					
Hickory	American hazelnut, black chokeberry, common winterberry, coralberry, gray dogwood, mapleleaf viburnum	American plum, American witchhazel, Arnold hawthorn, blackhaw, common chokecherry, common serviceberry, prairie crabapple	Douglas fir, arborvitae, black walnut, blackgum, blue spruce, bur oak, eastern redcedar, pecan	Norway spruce, common hackberry, pin oak, tuliptree	Carolina poplar, 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
947D3:					
Passport	American plum, black chokeberry, blackhaw, common juniper, gray dogwood, mapleleaf viburnum	Cockspur hawthorn, common serviceberry, eastern redcedar, nannyberry, prairie crabapple	Bur oak, chinkapin oak, thornless honeylocust	---	---
967F:					
Hickory	American hazelnut, black chokeberry, common winterberry, coralberry, gray dogwood, mapleleaf viburnum	American plum, American witchhazel, Arnold hawthorn, blackhaw, common chokecherry, common serviceberry, prairie crabapple	Douglas fir, arborvitae, black walnut, blackgum, blue spruce, bur oak, eastern redcedar, pecan	Norway spruce, common hackberry, pin oak, tuliptree	Carolina poplar, eastern white pine
Gosport	American cranberrybush, American hazelnut, black chokeberry, common chokecherry, common elderberry, common juniper, coralberry, mapleleaf viburnum, silky dogwood	American plum, bur oak, chinkapin oak, common serviceberry, eastern redcedar, nannyberry, prairie crabapple, roughleaf dogwood, smooth sumac	Black oak, common hackberry, eastern white pine	Carolina poplar	---
991A:					
Cisne	American cranberrybush, black chokeberry, buttonbush, common elderberry, common ninebark, common winterberry, gray dogwood, highbush blueberry, northern spicebush, redosier dogwood, silky dogwood	Cockspur hawthorn, hazel alder, nannyberry, roughleaf dogwood	Arborvitae, blackgum, common hackberry, green hawthorn, northern white-cedar, shingle oak	Red maple, river birch, swamp white oak, sweetgum	Carolina poplar, 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
991A: Huey	Common juniper	American hazelnut, common serviceberry, common winterberry, eastern redcedar, prairie crabapple	Douglas fir, blue spruce, eastern white pine	---	---
1524A: Zipp	American cranberrybush, black chokeberry, buttonbush, common elderberry, common ninebark, common winterberry, gray dogwood, highbush blueberry, northern spicebush, redosier dogwood, silky dogwood	Cockspur hawthorn, hazel alder, nannyberry, roughleaf dogwood	Arborvitae, blackgum, common hackberry, green hawthorn, northern white-cedar, shingle oak	Red maple, river birch, swamp white oak, sweetgum	Carolina poplar, eastern cottonwood, pin oak
3072A: Sharon	American cranberrybush, Canada yew, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, northern spicebush, redosier dogwood, silky dogwood	Blackhaw, cockspur hawthorn, common pawpaw, common serviceberry, prairie crabapple, roughleaf dogwood, rusty blackhaw, southern arrowwood, witchhazel	Austrian pine, Douglas fir, arborvitae, blue spruce, common persimmon, eastern redcedar, green hawthorn, nannyberry, pecan, shingle oak	Norway spruce, blackgum, common hackberry, red maple, swamp white oak, sweetgum	Carolina poplar, eastern cottonwood, pin oak
3108A: Bonnie	American cranberrybush, black chokeberry, buttonbush, common elderberry, common ninebark, common winterberry, gray dogwood, highbush blueberry, northern spicebush, redosier dogwood, silky dogwood	Cockspur hawthorn, hazel alder, nannyberry, roughleaf dogwood	Arborvitae, blackgum, common hackberry, green hawthorn, northern white-cedar, shingle oak	Red maple, river birch, swamp white oak, sweetgum	Carolina poplar, 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
3108T:					
Bonnie	American cranberrybush, black chokeberry, buttonbush, common elderberry, common ninebark, common winterberry, gray dogwood, highbush blueberry, northern spicebush, redosier dogwood, silky dogwood	Cockspur hawthorn, hazel alder, nannyberry, roughleaf dogwood	Arborvitae, blackgum, common hackberry, green hawthorn, northern white-cedar, shingle oak	Red maple, river birch, swamp white oak, sweetgum	Carolina poplar, eastern cottonwood, pin oak
3225A:					
Holton	American cranberrybush, Canada yew, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, northern spicebush, redosier dogwood, silky dogwood	Blackhaw, cockspur hawthorn, common pawpaw, common serviceberry, prairie crabapple, roughleaf dogwood, rusty blackhaw, southern arrowwood, witchhazel	Austrian pine, Douglas fir, arborvitae, blue spruce, common persimmon, eastern redcedar, green hawthorn, nannyberry, pecan, shingle oak	Norway spruce, blackgum, common hackberry, red maple, swamp white oak, sweetgum	Carolina poplar, eastern cottonwood, pin oak
3226A:					
Wirt	American cranberrybush, Canada yew, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, northern spicebush, redosier dogwood, silky dogwood	Blackhaw, cockspur hawthorn, common pawpaw, common serviceberry, prairie crabapple, roughleaf dogwood, rusty blackhaw, southern arrowwood, witchhazel	Austrian pine, Douglas fir, arborvitae, blue spruce, common persimmon, eastern redcedar, green hawthorn, nannyberry, pecan, shingle oak	Norway spruce, blackgum, common hackberry, red maple, swamp white oak, sweetgum	Carolina poplar, 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
3333A:					
Wakeland	American cranberrybush, Canada yew, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, northern spicebush, redosier dogwood, silky dogwood	Blackhaw, cockspur hawthorn, common pawpaw, common serviceberry, prairie crabapple, roughleaf dogwood, rusty blackhaw, southern arrowwood, witchhazel	Austrian pine, Douglas fir, arborvitae, blue spruce, common persimmon, eastern redcedar, green hawthorn, nannyberry, pecan, shingle oak	Norway spruce, blackgum, common hackberry, red maple, swamp white oak, sweetgum	Carolina poplar, eastern cottonwood, pin oak
3334A:					
Birds	American cranberrybush, black chokeberry, buttonbush, common elderberry, common ninebark, common winterberry, gray dogwood, highbush blueberry, northern spicebush, redosier dogwood, silky dogwood	Cockspur hawthorn, hazel alder, nannyberry, roughleaf dogwood	Arborvitae, blackgum, common hackberry, green hawthorn, northern white-cedar, shingle oak	Red maple, river birch, swamp white oak, sweetgum	Carolina poplar, eastern cottonwood, pin oak
3382A:					
Belknap	American cranberrybush, Canada yew, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, northern spicebush, redosier dogwood, silky dogwood	Blackhaw, cockspur hawthorn, common pawpaw, common serviceberry, prairie crabapple, roughleaf dogwood, rusty blackhaw, southern arrowwood, witchhazel	Austrian pine, Douglas fir, arborvitae, blue spruce, common persimmon, eastern redcedar, green hawthorn, nannyberry, pecan, shingle oak	Norway spruce, blackgum, common hackberry, red maple, swamp white oak, sweetgum	Carolina poplar, 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
3415A:					
Orion	American cranberrybush, Canada yew, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, northern spicebush, redosier dogwood, silky dogwood	Blackhaw, cockspur hawthorn, common pawpaw, common serviceberry, prairie crabapple, roughleaf dogwood, rusty blackhaw, southern arrowwood, witchhazel	Austrian pine, Douglas fir, arborvitae, blue spruce, common persimmon, eastern redcedar, green hawthorn, nannyberry, pecan, shingle oak	Norway spruce, blackgum, common hackberry, red maple, swamp white oak, sweetgum	Carolina poplar, eastern cottonwood, pin oak
7337B:					
Creal	American cranberrybush, Canada yew, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, northern spicebush, redosier dogwood, silky dogwood	Blackhaw, cockspur hawthorn, common pawpaw, common serviceberry, prairie crabapple, roughleaf dogwood, rusty blackhaw, southern arrowwood, witchhazel	Austrian pine, Douglas fir, arborvitae, blue spruce, common persimmon, eastern redcedar, green hawthorn, nannyberry, pecan, shingle oak	Norway spruce, blackgum, common hackberry, red maple, swamp white oak, sweetgum	Carolina poplar, eastern cottonwood, pin oak
8787A:					
Banlic	American plum, black chokeberry, blackhaw, common juniper, gray dogwood, mapleleaf viburnum	Cockspur hawthorn, common serviceberry, eastern redcedar, nannyberry, prairie crabapple	Bur oak, chinkapin oak, thornless honeylocust	---	---

Table 11.--Forestland Productivity

(Only the soils suitable for production of commercial trees are listed)

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Suggested trees to plant
			cu ft/ac	
2A:				
Cisne	Bitternut hickory	---	---	Common hackberry, eastern cottonwood, pin oak, river birch, swamp white oak, sweetgum.
	Black oak	---	---	
	Pin oak	70	57	
	White oak	---	---	
3A:				
Hoyleton	Bur oak	---	---	Common hackberry, common persimmon, eastern cottonwood, pecan, pin oak, swamp white oak.
	Green ash	---	---	
	Northern red oak	70	57	
	White oak	70	57	
3B:				
Hoyleton	Bur oak	---	---	Common hackberry, common persimmon, eastern cottonwood, pecan, pin oak, swamp white oak.
	Green ash	---	---	
	Northern red oak	70	57	
	White oak	70	57	
3B2:				
Hoyleton	Bur oak	---	---	Common hackberry, common persimmon, eastern cottonwood, pecan, pin oak, swamp white oak.
	Green ash	---	---	
	Northern red oak	70	57	
	White oak	70	57	
4B:				
Richview	Eastern cottonwood	105	---	Black walnut, eastern cottonwood, eastern white pine, northern red oak, pecan, pin oak, tuliptree, white oak.
	Northern red oak	75	---	
	White oak	73	---	
	Yellow poplar	87	---	
4C2:				
Richview	Eastern cottonwood	105	---	Black walnut, eastern cottonwood, eastern white pine, northern red oak, pecan, pin oak, tuliptree, white oak.
	Northern red oak	75	---	
	White oak	73	---	
	Yellow poplar	87	---	
5C3:				
Blair	Northern red oak	70	57	Common hackberry, common persimmon, eastern cottonwood, pecan, pin oak, swamp white oak.
	Bur oak	70	57	
	White oak	70	57	
	Green ash	---	---	
7C2:				
Atlas	Bur oak	70	57	Bur oak, chinkapin oak, eastern redcedar, honeylocust.
	Green ash	---	---	
	Northern red oak	70	57	
	White oak	70	57	
7C3:				
Atlas	Bur oak	70	57	Black oak, bur oak, chinkapin oak, common hackberry, eastern redcedar.
	Green ash	---	---	
	Northern red oak	70	57	
	White oak	70	57	

Table 11.--Forestland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Suggested trees to plant
			cu ft/ac	
7D2:				
Atlas	Northern red oak	70	57	Black oak, bur oak, chinkapin oak, common hackberry, eastern redcedar.
	White oak	70	57	
	Bur oak	70	57	
	Green ash	---	---	
7D3:				
Atlas	Bur oak	70	57	Bur oak, chinkapin oak, eastern redcedar, honeylocust.
	Green ash	---	---	
	Northern red oak	70	57	
	White oak	70	57	
8D3:				
Hickory	Northern red oak	61	---	Black oak, chinkapin oak, hickory, northern red oak, southern red oak, white oak.
	White oak	65	---	
8F:				
Hickory	Bitternut hickory	---	---	Bur oak, eastern white pine, pecan, pin oak, tuliptree.
	Black oak	---	---	
	Green ash	---	---	
	Northern red oak	85	72	
	Tuliptree	95	100	
	White oak	85	72	
8G:				
Hickory	Bitternut hickory	---	---	Black walnut, bur oak, eastern white pine, pecan, pin oak, tuliptree.
	Black oak	---	---	
	Green ash	---	---	
	Northern red oak	85	72	
	Tuliptree	95	100	
	White oak	85	72	
10C:				
Plumfield	Northern red oak	64	---	Bur oak, chinkapin oak, eastern redcedar, honeylocust.
	White oak	58	---	
12A:				
Wynoose	Black oak	---	---	Common hackberry, eastern cottonwood, pin oak, river birch, swamp white oak, sweetgum.
	Pin oak	70	57	
	White oak	---	---	
13A:				
Bluford	Bur oak	---	---	Black oak, bur oak, chinkapin oak, common hackberry, eastern redcedar.
	Green ash	---	---	
	Northern red oak	70	57	
	Southern red oak	70	57	
	White oak	70	57	
13B:				
Bluford	Bur oak	---	---	Black oak, bur oak, chinkapin oak, common hackberry, eastern redcedar.
	Green ash	---	---	
	Northern red oak	70	57	
	Southern red oak	70	57	
	White oak	70	57	

Table 11.--Forestland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Suggested trees to plant
			cu ft/ac	
13B2:				
Bluford	Bur oak	---	---	Black oak, bur oak, chinkapin oak, common hackberry, eastern redcedar.
	Green ash	---	---	
	Northern red oak	70	57	
	Southern red oak	70	57	
	White oak	70	57	
14B:				
Ava	Black walnut	---	---	Black oak, bur oak, chinkapin oak, common hackberry, eastern redcedar.
	Northern red oak	80	57	
	Tuliptree	90	86	
	White oak	75	57	
14C2:				
Ava	Black walnut	---	---	Black oak, bur oak, chinkapin oak, common hackberry, eastern redcedar.
	Northern red oak	80	57	
	Tuliptree	90	86	
	White oak	75	57	
15B2:				
Parke	Northern red oak	78	---	Black walnut, eastern cottonwood, eastern white pine, northern red oak, pecan, pin oak, tuliptree, white oak.
	White oak	76	---	
	Yellow poplar	95	---	
109A:				
Racoon	Cottonwood	103	---	Common hackberry, eastern cottonwood, pin oak, river birch, swamp white oak, sweetgum.
	Pin oak	93	---	
	Yellow poplar	91	---	
120A:				
Huey	Eastern cottonwood	89	---	Rocky Mountain Douglas-fir, blue spruce, eastern redcedar, eastern white pine.
	Pin oak	81	---	
	Yellow poplar	69	---	
218A:				
Newberry	---	---	---	Common hackberry, eastern cottonwood, pin oak, river birch, swamp white oak, sweetgum.
421G:				
Kell	Black cherry	---	---	Black oak, common hackberry, eastern white pine.
	Black walnut	---	---	
	Shagbark hickory	---	---	
	Tuliptree	---	---	
	White oak	80	57	
551D2:				
Gosport	White oak	45	29	Black oak, common hackberry, eastern white pine.
551F:				
Gosport	White oak	45	29	Black oak, common hackberry, eastern white pine.

Table 11.--Forestland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Suggested trees to plant
			cu ft/ac	
551G:				
Gosport	White oak	45	29	Black oak, common hackberry, eastern white pine.
581A:				
Tamalco	Eastern cottonwood	86	---	Rocky Mountain Douglas-fir, blue spruce, eastern redcedar, eastern white pine.
	Northern red oak	69	---	
	White ash	69	---	
	White oak	60	---	
	Yellow poplar	73	---	
652C2:				
Passport	White oak	70	57	Bur oak, chinkapin oak, eastern redcedar, honeylocust.
	Bur oak	70	57	
	Northern red oak	70	57	
	Green ash	---	---	
652D2:				
Passport	White oak	70	57	Bur oak, chinkapin oak, eastern redcedar, honeylocust.
	Bur oak	70	57	
	Northern red oak	70	57	
	Green ash	---	---	
801B:				
Orthents	---	---	---	Black locust, cherrybark oak, hickory, northern red oak, pin oak, white oak.
888C2:				
Passport	White oak	70	57	Bur oak, chinkapin oak, eastern redcedar, honeylocust.
	Bur oak	70	57	
	Northern red oak	70	57	
	Green ash	---	---	
Grantfork	White oak	70	57	Bur oak, chinkapin oak, eastern redcedar, honeylocust.
	Bur oak	70	57	
	Northern red oak	70	57	
	Green ash	---	---	
908D2:				
Hickory	Northern red oak	85	72	Black walnut, bur oak, eastern white pine, pecan, pin oak, tuliptree.
	White oak	85	72	
	Black oak	---	---	
	Green ash	---	---	
	Bitternut hickory	---	---	
	Tuliptree	---	---	
Kell	Black cherry	---	---	Black oak, common hackberry, eastern white pine.
	Black walnut	---	---	
	Shagbark hickory	---	---	
	Tuliptree	---	---	
	White oak	80	57	
908F:				
Hickory	Bitternut hickory	---	---	Black walnut, bur oak, eastern white pine, pecan, pin oak, tuliptree.
	Black oak	---	---	
	Green ash	---	---	
	Northern red oak	85	72	
	Tuliptree	95	100	
	White oak	85	72	

Table 11.--Forestland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Suggested trees to plant
			cu ft/ac	
908F:				
Kell	Black cherry	---	---	Black oak, common hackberry, eastern white pine.
	Black walnut	---	---	
	Shagbark hickory	---	---	
	Tuliptree	---	---	
	White oak	80	57	
912A:				
Hoyleton	Bur oak	---	---	Common hackberry, eastern cottonwood, pin oak, river birch, swamp white oak, sweetgum.
	Green ash	---	---	
	Northern red oak	70	57	
	White oak	70	57	
Darmstadt	Black oak	70	57	Rocky Mountain Douglas-fir, blue spruce, eastern redcedar, eastern white pine.
	Pignut hickory	---	---	
	White oak	70	57	
912B:				
Hoyleton	Bur oak	---	---	Common hackberry, eastern cottonwood, pin oak, river birch, swamp white oak, sweetgum.
	Green ash	---	---	
	Northern red oak	70	57	
	White oak	70	57	
Darmstadt	Black oak	70	57	Rocky Mountain Douglas-fir, blue spruce, eastern redcedar, eastern white pine.
	Pignut hickory	---	---	
	White oak	70	57	
912B2:				
Hoyleton	Bur oak	---	---	Black oak, bur oak, chinkapin oak, common hackberry, eastern redcedar.
	Green ash	---	---	
	Northern red oak	70	57	
	White oak	70	57	
Darmstadt	Black oak	70	57	Rocky Mountain Douglas-fir, blue spruce, eastern redcedar, eastern white pine.
	Pignut hickory	---	---	
	White oak	70	57	
914C2:				
Atlas	Bur oak	70	57	Black oak, bur oak, chinkapin oak, common hackberry, eastern redcedar.
	Green ash	---	---	
	Northern red oak	70	57	
	White oak	70	57	
Grantfork	Bur oak	70	57	Bur oak, chinkapin oak, eastern redcedar, honeylocust.
	Green ash	---	---	
	Northern red oak	70	57	
	White oak	70	57	
929D2:				
Ava	Black walnut	---	---	Black oak, bur oak, chinkapin oak, common hackberry, eastern redcedar.
	Northern red oak	80	57	
	Tuliptree	90	86	
	White oak	75	57	
Hickory	Northern red oak	85	72	Black walnut, bur oak, eastern white pine, pecan, pin oak, tuliptree.
	White oak	85	72	
	Black oak	---	---	
	Green ash	---	---	
	Bitternut hickory	---	---	
	Tuliptree	---	---	

Table 11.--Forestland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Suggested trees to plant
			cu ft/ac	
947D2:				
Hickory	Northern red oak	85	72	Black walnut, bur oak, eastern white pine, pecan, pin oak, tuliptree.
	White oak	85	72	
	Black oak	---	---	
	Green ash	---	---	
	Bitternut hickory	---	---	
	Tuliptree	---	---	
Passport	White oak	70	57	Bur oak, chinkapin oak, eastern redcedar, honeylocust.
	Bur oak	70	57	
	Northern red oak	70	57	
	Green ash	---	---	
947D3:				
Hickory	Northern red oak	85	72	Black walnut, bur oak, eastern white pine, pecan, pin oak, tuliptree.
	White oak	85	72	
	Black oak	---	---	
	Green ash	---	---	
	Bitternut hickory	---	---	
	Tuliptree	---	---	
Passport	White oak	70	57	Bur oak, chinkapin oak, eastern redcedar, honeylocust.
	Bur oak	70	57	
	Northern red oak	70	57	
	Green ash	---	---	
967F:				
Hickory	Bitternut hickory	---	---	Black walnut, bur oak, eastern white pine, pecan, pin oak, tuliptree.
	Black oak	---	---	
	Green ash	---	---	
	Northern red oak	85	72	
	Tuliptree	95	100	
	White oak	85	72	
Gosport	White oak	45	29	Black oak, common hackberry, eastern white pine.
991A:				
Cisne	Bitternut hickory	---	---	Common hackberry, eastern cottonwood, pin oak, river birch, swamp white oak, sweetgum.
	Black oak	---	---	
	Pin oak	70	57	
	White oak	---	---	
Huey	Eastern cottonwood	89	---	Rocky Mountain Douglas-fir, blue spruce, eastern redcedar, eastern white pine.
	Pin oak	81	---	
	Tuliptree	69	---	
1524A:				
Zipp	Pin oak	86	72	Common hackberry, eastern cottonwood, pin oak, river birch, swamp white oak, sweetgum.
	Sweetgum	90	100	
	White oak	75	57	
3072A:				
Sharon	Eastern cottonwood	103	---	Common hackberry, common persimmon, eastern cottonwood, pecan, pin oak, swamp white oak.
	Pin oak	93	---	

Table 11.--Forestland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Suggested trees to plant
			cu ft/ac	
3108A:				
Bonnie	Eastern cottonwood	100	---	Baldcypress, eastern cottonwood, overcup oak, pin oak, red maple, swamp white oak, sweetgum.
	Pin oak	90	---	
3108T:				
Bonnie	Eastern cottonwood	100	---	Common hackberry, eastern cottonwood, pin oak, river birch, swamp white oak, sweetgum.
	Pin oak	90	---	
3225A:				
Holton	Tuliptree	105	114	Common hackberry, common persimmon, eastern cottonwood, pecan, pin oak, swamp white oak.
3226A:				
Wirt	Tuliptree	105	114	Common hackberry, common persimmon, eastern cottonwood, pecan, pin oak, swamp white oak.
3333A:				
Wakeland	White oak	---	57	Common hackberry, common persimmon, eastern cottonwood, pecan, pin oak, swamp white oak.
	Northern red oak	---	---	
	Eastern cottonwood	99	---	
	Pin oak	90	---	
3334A:				
Birds	White oak	---	57	Common hackberry, eastern cottonwood, pin oak, river birch, swamp white oak, sweetgum.
	Northern red oak	---	---	
	Eastern cottonwood	99	---	
	Pin oak	90	---	
3382A:				
Belknap	Eastern cottonwood	102	---	Common hackberry, common persimmon, eastern cottonwood, pecan, pin oak, swamp white oak.
	Pin oak	92	---	
3415A:				
Orion	Eastern cottonwood	105	---	Common hackberry, common persimmon, eastern cottonwood, pecan, pin oak, swamp white oak.
	Pin oak	95	---	
7337B:				
Creal	White oak	76	---	Common hackberry, common persimmon, eastern cottonwood, pecan, pin oak, swamp white oak.
	Northern red oak	75	---	
	Pin oak	91	---	
	Yellow poplar	89	---	
8787A:				
Banlic	Black walnut	---	---	Bur oak, chinkapin oak, eastern redcedar, honeylocust.
	Pin oak	90	72	
	Southern red oak	85	72	
	Tuliptree	---	---	
	White oak	75	57	

Table 12a.--Recreational Development

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Camp areas		Picnic areas		Playgrounds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2A:						
Cisne	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Slow water movement	0.98	Slow water movement	0.98	Slow water movement	0.98
3A:						
Hoyleton	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.88	Depth to saturated zone	0.56	Depth to saturated zone	0.88
	Slow water movement	0.43	Slow water movement	0.43	Slow water movement	0.43
3B:						
Hoyleton	Somewhat limited		Somewhat limited		Somewhat limited	
	Slow water movement	0.43	Slow water movement	0.43	Slow water movement	0.43
	Depth to saturated zone	0.39	Depth to saturated zone	0.19	Depth to saturated zone	0.39
					Slope	0.12
3B2:						
Hoyleton	Somewhat limited		Somewhat limited		Somewhat limited	
	Slow water movement	0.43	Slow water movement	0.43	Slow water movement	0.43
	Depth to saturated zone	0.39	Depth to saturated zone	0.19	Depth to saturated zone	0.39
					Slope	0.12
4B:						
Richview	Not limited		Not limited		Not limited	
4C2:						
Richview	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.01	Slope	0.01	Slope	1.00
5C3:						
Blair	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Slow water movement	0.21	Slow water movement	0.21	Slope	1.00
					Slow water movement	0.21
7C2:						
Atlas	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Slow water movement	0.96	Slow water movement	0.96	Slope	1.00
					Slow water movement	0.96

Table 12a.--Recreational Development--Continued

Map symbol and soil name	Camp areas		Picnic areas		Playgrounds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
7C3:						
Atlas---------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Slow water movement	0.98	Slow water movement	0.98	Slope	1.00
	Slope	0.04	Slope	0.04	Slow water movement	0.98
7D2:						
Atlas---------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Slow water movement	0.96	Slow water movement	0.96	Slope	1.00
	Slope	0.63	Slope	0.63	Slow water movement	0.96
7D3:						
Atlas---------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Slow water movement	0.98	Slow water movement	0.98	Slope	1.00
	Slope	0.84	Slope	0.84	Slow water movement	0.98
8D3:						
Hickory-------------	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.96	Slope	0.96	Slope	1.00
8F:						
Hickory-------------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
8G:						
Hickory-------------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
10C:						
Plumfield-----------	Somewhat limited		Somewhat limited		Very limited	
	Slow water movement	0.21	Slow water movement	0.21	Slope	1.00
	Slope	0.01	Slope	0.01	Slow water movement	0.21
12A:						
Wynoose-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Slow water movement	0.98	Slow water movement	0.98	Slow water movement	0.98
13A:						
Bluford-------------	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.94	Depth to saturated zone	1.00
	Slow water movement	0.43	Slow water movement	0.43	Slow water movement	0.43

Table 12a.--Recreational Development--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
13B:						
Bluford	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.94	Depth to saturated zone	1.00
	Slow water movement	0.21	Slow water movement	0.21	Slow water movement	0.21
					Slope	0.12
13B2:						
Bluford	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	0.68	Depth to saturated zone	0.95
	Slow water movement	0.43	Slow water movement	0.43	Slow water movement	0.43
					Slope	0.12
14B:						
Ava	Somewhat limited		Somewhat limited		Somewhat limited	
	Slow water movement	0.21	Slow water movement	0.21	Slow water movement	0.21
	Depth to saturated zone	0.07	Depth to saturated zone	0.03	Slope	0.12
					Depth to saturated zone	0.07
14C2:						
Ava	Somewhat limited		Somewhat limited		Very limited	
	Slow water movement	0.21	Slow water movement	0.21	Slope	1.00
	Depth to saturated zone	0.07	Depth to saturated zone	0.03	Slow water movement	0.21
	Slope	0.01	Slope	0.01	Depth to saturated zone	0.07
15B2:						
Parke	Not limited		Not limited		Somewhat limited	
					Slope	0.12
109A:						
Racoon	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Slow water movement	0.96	Slow water movement	0.96	Slow water movement	0.96
120A:						
Huey	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
	Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
218A:						
Newberry	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Slow water movement	0.43	Slow water movement	0.43	Slow water movement	0.43

Table 12a.--Recreational Development--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
421G:						
Kell	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
					Depth to bedrock	0.10
533:						
Urban land	Not rated		Not rated		Not rated	
551D2:						
Gosport	Somewhat limited		Somewhat limited		Very limited	
	Slow water movement	0.96	Slow water movement	0.96	Slope	1.00
	Slope	0.63	Slope	0.63	Slow water movement	0.96
					Depth to bedrock	0.16
551F:						
Gosport	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Slow water movement	0.96	Slow water movement	0.96	Slow water movement	0.96
					Depth to bedrock	0.29
551G:						
Gosport	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Slow water movement	0.96	Slow water movement	0.96	Slow water movement	0.96
					Depth to bedrock	0.16
581A:						
Tamalco	Very limited		Very limited		Very limited	
	Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
	Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
652C2:						
Passport	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.98	Slow water movement	0.96	Depth to saturated zone	0.98
	Slow water movement	0.96	Depth to saturated zone	0.75	Slow water movement	0.96
					Slope	0.88
652D2:						
Passport	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Depth to saturated zone	0.98	Slow water movement	0.96	Depth to saturated zone	0.98
	Slow water movement	0.96	Depth to saturated zone	0.75	Slow water movement	0.96
801B:						
Orthents	Not limited		Not limited		Somewhat limited	
					Slope	0.50
810:						
Oil-waste land	Not rated		Not rated		Not rated	

Table 12a.--Recreational Development--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
888C2:						
Passport	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.98	Slow water movement	0.96	Depth to saturated zone	0.98
	Slow water movement	0.96	Depth to saturated zone	0.75	Slow water movement	0.96
					Slope	0.88
Grantfork	Somewhat limited		Somewhat limited		Very limited	
	Depth to saturated zone	0.98	Slow water movement	0.96	Slope	1.00
	Slow water movement	0.96	Depth to saturated zone	0.75	Depth to saturated zone	0.98
	Slope	0.04	Slope	0.04	Slow water movement	0.96
908D2:						
Hickory	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.96	Slope	0.96	Slope	1.00
Kell	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
					Depth to bedrock	0.01
908F:						
Hickory	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
Kell	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
					Depth to bedrock	0.10
912A:						
Hoyleton	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.88	Depth to saturated zone	0.56	Depth to saturated zone	0.88
	Slow water movement	0.43	Slow water movement	0.43	Slow water movement	0.43
Darmstadt	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Sodium content	1.00	Depth to saturated zone	1.00
	Sodium content	1.00	Slow water movement	1.00	Sodium content	1.00
	Slow water movement	1.00	Depth to saturated zone	0.88	Slow water movement	1.00
912B:						
Hoyleton	Somewhat limited		Somewhat limited		Somewhat limited	
	Slow water movement	0.43	Slow water movement	0.43	Slow water movement	0.43
	Depth to saturated zone	0.39	Depth to saturated zone	0.19	Depth to saturated zone	0.39
					Slope	0.12
Darmstadt	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Sodium content	1.00	Depth to saturated zone	1.00
	Sodium content	1.00	Slow water movement	1.00	Sodium content	1.00
	Slow water movement	1.00	Depth to saturated zone	0.88	Slow water movement	1.00
					Slope	0.12

Table 12a.--Recreational Development--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
912B2:						
Hoyleton	Somewhat limited		Somewhat limited		Somewhat limited	
	Slow water movement	0.43	Slow water movement	0.43	Slow water movement	0.43
	Depth to saturated zone	0.39	Depth to saturated zone	0.19	Depth to saturated zone	0.39
					Slope	0.12
Darmstadt	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Sodium content	1.00	Depth to saturated zone	1.00
	Sodium content	1.00	Slow water movement	1.00	Sodium content	1.00
	Slow water movement	1.00	Depth to saturated zone	0.88	Slow water movement	1.00
					Slope	0.50
914C2:						
Atlas	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Slow water movement	0.96	Slow water movement	0.96	Slope	1.00
					Slow water movement	0.96
Grantfork	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Slow water movement	0.96	Slow water movement	0.96	Slope	1.00
					Slow water movement	0.96
929D2:						
Ava	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.37	Slope	0.37	Slope	1.00
	Slow water movement	0.21	Slow water movement	0.21	Slow water movement	0.21
	Depth to saturated zone	0.07	Depth to saturated zone	0.03	Depth to saturated zone	0.07
Hickory	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
947D2:						
Hickory	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
Passport	Somewhat limited		Somewhat limited		Very limited	
	Depth to saturated zone	0.98	Slow water movement	0.96	Slope	1.00
	Slow water movement	0.96	Depth to saturated zone	0.75	Depth to saturated zone	0.98
	Slope	0.63	Slope	0.63	Slow water movement	0.96
947D3:						
Hickory	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
					Gravel content	0.22

Table 12a.--Recreational Development--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
947D3:						
Passport	Somewhat limited		Somewhat limited		Very limited	
	Depth to saturated zone	0.98	Slow water movement	0.96	Slope	1.00
	Slow water movement	0.96	Depth to saturated zone	0.75	Depth to saturated zone	0.98
	Slope	0.63	Slope	0.63	Slow water movement	0.96
967F:						
Hickory	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
Gosport	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Slow water movement	0.96	Slow water movement	0.96	Slow water movement	0.96
					Depth to bedrock	0.29
991A:						
Cisne	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Slow water movement	0.98	Slow water movement	0.98	Slow water movement	0.98
Huey	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
	Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
1524A:						
Zipp	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Flooding	1.00	Ponding	1.00	Flooding	1.00
	Ponding	1.00	Slow water movement	0.96	Ponding	1.00
	Slow water movement	0.96	Flooding	0.40	Slow water movement	0.96
3072A:						
Sharon	Very limited		Somewhat limited		Very limited	
	Flooding	1.00	Flooding	0.40	Flooding	1.00
3108A:						
Bonnie	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Flooding	1.00	Ponding	1.00	Flooding	1.00
	Ponding	1.00	Flooding	0.40	Ponding	1.00
	Slow water movement	0.21	Slow water movement	0.21	Slow water movement	0.21

Table 12a.--Recreational Development--Continued

Map symbol and soil name	Camp areas		Picnic areas		Playgrounds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3108T:						
Bonnie	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
	Flooding	1.00	Ponding	1.00	Flooding	1.00
	Ponding	1.00	Slow water movement	0.96	Ponding	1.00
	Slow water movement	0.96	Flooding	0.40	Slow water movement	0.96
3225A:						
Holton	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.96	Depth to saturated zone	1.00
	Flooding	1.00	Flooding	0.40	Flooding	1.00
3226A:						
Wirt	Very limited		Somewhat limited		Very limited	
	Flooding	1.00	Flooding	0.40	Flooding	1.00
3333A:						
Wakeland	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Flooding	1.00	Flooding	0.40	Flooding	1.00
3334A:						
Birds	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Flooding	1.00	Ponding	1.00	Flooding	1.00
	Ponding	1.00	Flooding	0.40	Ponding	1.00
	Slow water movement	0.21	Slow water movement	0.21	Slow water movement	0.21
3382A:						
Belknap	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.99	Depth to saturated zone	1.00
	Flooding	1.00	Flooding	0.40	Flooding	1.00
3415A:						
Orion	Very limited		Somewhat limited		Very limited	
	Flooding	1.00	Depth to saturated zone	0.68	Flooding	1.00
	Depth to saturated zone	0.95	Flooding	0.40	Depth to saturated zone	0.95
7337B:						
Creal	Very limited		Somewhat limited		Somewhat limited	
	Flooding	1.00	Depth to saturated zone	0.75	Depth to saturated zone	0.98
	Depth to saturated zone	0.98	Slow water movement	0.21	Slow water movement	0.21
	Slow water movement	0.21				

Table 12a.--Recreational Development--Continued

Map symbol and soil name	Camp areas		Picnic areas		Playgrounds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
8787A:						
Banlic--------------	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.99	Depth to saturated zone	1.00
	Flooding	1.00	Slow water movement	0.21	Flooding	0.60
	Slow water movement	0.21			Slow water movement	0.21

Table 12b.--Recreational Development

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2A:							
Cisne---------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
3A:							
Hoyleton------------	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.18	Depth to saturated zone	0.18	Depth to saturated zone	0.56
3B:							
Hoyleton------------	90	Not limited		Not limited		Somewhat limited	
						Depth to saturated zone	0.19
3B2:							
Hoyleton------------	90	Not limited		Not limited		Somewhat limited	
						Depth to saturated zone	0.19
4B:							
Richview------------	92	Not limited		Not limited		Not limited	
4C2:							
Richview------------	92	Not limited		Not limited		Somewhat limited	
						Slope	0.01
5C3:							
Blair---------------	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
7C2:							
Atlas---------------	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
7C3:							
Atlas---------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
						Slope	0.04
7D2:							
Atlas---------------	90	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope	0.63

Table 12b.--Recreational Development--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
7D3:							
Atlas	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
						Slope	0.84
8D3:							
Hickory	90	Not limited		Not limited		Somewhat limited	
						Slope	0.96
8F:							
Hickory	91	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Slope	0.02	Too steep	1.00
8G:							
Hickory	95	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Too steep	1.00
10C:							
Plumfield	90	Not limited		Not limited		Somewhat limited	
						Slope	0.01
12A:							
Wynoose	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
13A:							
Bluford	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.86	Depth to saturated zone	0.86	Depth to saturated zone	0.94
13B:							
Bluford	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.86	Depth to saturated zone	0.86	Depth to saturated zone	0.94
13B2:							
Bluford	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.32	Depth to saturated zone	0.32	Depth to saturated zone	0.68
14B:							
Ava	90	Not limited		Not limited		Somewhat limited	
						Depth to saturated zone	0.03
14C2:							
Ava	90	Not limited		Not limited		Somewhat limited	
						Depth to saturated zone	0.03
						Slope	0.01
15B2:							
Parke	90	Not limited		Not limited		Not limited	

Table 12b.--Recreational Development--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
109A:							
Racoon----------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
120A:							
Huey----------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Sodium content	1.00
		Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
						Ponding	1.00
218A:							
Newberry----------	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
421G:							
Kell----------	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Too steep	1.00
						Depth to bedrock	0.10
533:							
Urban land----------	90	Not rated		Not rated		Not rated	
551D2:							
Gosport----------	90	Not limited		Not limited		Somewhat limited	
						Slope	0.63
						Depth to bedrock	0.16
551F:							
Gosport----------	90	Somewhat limited		Not limited		Very limited	
		Slope	0.82			Too steep	1.00
						Depth to bedrock	0.29
551G:							
Gosport----------	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Too steep	1.00
						Depth to bedrock	0.16
581A:							
Tamalco----------	90	Not limited		Not limited		Very limited	
						Sodium content	1.00
652C2:							
Passport----------	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
652D2:							
Passport----------	90	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Too steep	1.00
		Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
801B:							
Orthents----------	90	Not limited		Not limited		Not limited	

Table 12b.--Recreational Development--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
810:							
Oil-waste land	80	Not rated		Not rated		Not rated	
888C2:							
Passport	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
Grantfork	35	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	0.75
		Depth to saturated zone	0.44	Depth to saturated zone	0.44	Slope	0.04
908D2:							
Hickory	60	Not limited		Not limited		Somewhat limited	
						Slope	0.96
Kell	30	Somewhat limited		Not limited		Very limited	
		Slope	0.02			Too steep	1.00
						Depth to bedrock	0.01
908F:							
Hickory	55	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Slope	0.02	Too steep	1.00
Kell	35	Somewhat limited		Not limited		Very limited	
		Slope	0.50			Too steep	1.00
						Depth to bedrock	0.10
912A:							
Hoyleton	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.18	Depth to saturated zone	0.18	Depth to saturated zone	0.56
Darmstadt	40	Somewhat limited		Somewhat limited		Very limited	
		Depth to saturated zone	0.73	Depth to saturated zone	0.73	Sodium content	1.00
						Depth to saturated zone	0.88
912B:							
Hoyleton	50	Not limited		Not limited		Somewhat limited	
						Depth to saturated zone	0.19
Darmstadt	40	Somewhat limited		Somewhat limited		Very limited	
		Depth to saturated zone	0.73	Depth to saturated zone	0.73	Sodium content	1.00
						Depth to saturated zone	0.88
912B2:							
Hoyleton	50	Not limited		Not limited		Somewhat limited	
						Depth to saturated zone	0.19
Darmstadt	40	Somewhat limited		Somewhat limited		Very limited	
		Depth to saturated zone	0.73	Depth to saturated zone	0.73	Sodium content	1.00
						Depth to saturated zone	0.88

Table 12b.--Recreational Development--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
914C2:							
Atlas	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Grantfork	40	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
929D2:							
Ava	55	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Slope	0.37
						Depth to saturated zone	0.03
Hickory	40	Somewhat limited		Not limited		Very limited	
		Slope	0.02			Too steep	1.00
947D2:							
Hickory	45	Somewhat limited		Not limited		Very limited	
		Slope	0.02			Too steep	1.00
Passport	40	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	0.75
		Depth to saturated zone	0.44	Depth to saturated zone	0.44	Slope	0.63
947D3:							
Hickory	45	Somewhat limited		Not limited		Very limited	
		Slope	0.02			Too steep	1.00
Passport	40	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
						Slope	0.63
967F:							
Hickory	50	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Slope	0.02	Too steep	1.00
Gosport	35	Somewhat limited		Not limited		Very limited	
		Slope	0.82			Too steep	1.00
						Depth to bedrock	0.29
991A:							
Cisne	50	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
Huey	40	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Sodium content	1.00
		Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
						Ponding	1.00

Table 12b.--Recreational Development--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
1524A:							
Zipp----------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Flooding	0.40	Flooding	0.40	Ponding	1.00
						Droughty	0.16
3072A:							
Sharon--------------	90	Somewhat limited		Somewhat limited		Very limited	
		Flooding	0.40	Flooding	0.40	Flooding	1.00
3108A:							
Bonnie--------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
						Flooding	1.00
		Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Flooding	0.40	Flooding	0.40		
3108T:							
Bonnie--------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
						Sodium content	1.00
		Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Flooding	0.40	Flooding	0.40		
						Ponding	1.00
3225A:							
Holton--------------	90	Somewhat limited		Somewhat limited		Very limited	
		Depth to saturated zone	0.92	Depth to saturated zone	0.92	Flooding	1.00
						Depth to saturated zone	0.96
		Flooding	0.40	Flooding	0.40		
3226A:							
Wirt----------------	90	Somewhat limited		Somewhat limited		Very limited	
		Flooding	0.40	Flooding	0.40	Flooding	1.00
3333A:							
Wakeland------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
						Depth to saturated zone	1.00
		Flooding	0.40	Flooding	0.40		
3334A:							
Birds---------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
						Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00		
		Flooding	0.40	Flooding	0.40	Ponding	1.00
3382A:							
Belknap-------------	90	Somewhat limited		Somewhat limited		Very limited	
		Depth to saturated zone	0.98	Depth to saturated zone	0.98	Flooding	1.00
						Depth to saturated zone	0.99
		Flooding	0.40	Flooding	0.40		

Table 12b.--Recreational Development--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3415A:							
Orion---------------	90	Somewhat limited		Somewhat limited		Very limited	
		Flooding	0.40	Flooding	0.40	Flooding	1.00
		Depth to saturated zone	0.32	Depth to saturated zone	0.32	Depth to saturated zone	0.68
7337B:							
Creal---------------	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
8787A:							
Banlic--------------	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.98	Depth to saturated zone	0.98	Depth to saturated zone	0.99
						Flooding	0.60

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
2A: Cisne	Poor	Fair	Fair	Fair	Poor	Good	Good	Fair	Fair	Good
3A: Hoyleton	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
3B: Hoyleton	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
3B2: Hoyleton	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
4B: Richview	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
4C2: Richview	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
5C3: Blair	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
7C2: Atlas	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
7C3: Atlas	Fair	Good	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor
7D2: Atlas	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
7D3: Atlas	Fair	Good	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor
8D3: Hickory	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
8F: Hickory	Very poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor
8G: Hickory	Very poor	Poor	Good	Good	Good	Very poor	Very poor	Poor	Good	Very poor
10C: Plumfield	Very poor	Very poor	Poor	Poor	Poor	Poor	Very poor	Very 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 herba- ceous plants	Hardwood trees	Conif- erous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
12A:										
Wynoose	Poor	Fair	Fair	Fair	Poor	Good	Good	Fair	Fair	Good
13A:										
Bluford	Fair	Good	Fair	Good	Good	Fair	Fair	Fair	Good	Fair
13B:										
Bluford	Fair	Good	Fair	Good	Good	Poor	Very poor	Fair	Good	Very poor
13B2:										
Bluford	Fair	Good	Fair	Good	Good	Poor	Very poor	Fair	Good	Very poor
14B:										
Ava	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
14C2:										
Ava	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
15B2:										
Parke	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
109A:										
Racoon	Poor	Fair	Fair	Fair	Poor	Good	Good	Fair	Fair	Good
120A:										
Huey	Poor	Fair	Very poor	Fair	Poor	Good	Good	Poor	Fair	Good
218A:										
Newberry	Poor	Fair	Fair	Fair	Poor	Good	Good	Fair	Fair	Good
421G:										
Kell	Very poor	Poor	Good	Good	Good	Very poor	Very poor	Poor	Good	Very poor
533.										
Urban land										
551D2:										
Gosport	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
551F:										
Gosport	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor
551G:										
Gosport	Very poor	Poor	Good	Good	Good	Very poor	Very poor	Poor	Good	Very poor
581A:										
Tamalco	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
652C2:										
Passport	Fair	Good	Good	Good	Good	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
652D2:										
Passport	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
801B:										
Orthents	Good	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor
810.										
Oil-waste land										
888C2:										
Passport	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
Grantfork	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
908D2:										
Hickory	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
Kell	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
908F:										
Hickory	Very poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor
Kell	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor
912A:										
Hoyleton	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
Darmstadt	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
912B:										
Hoyleton	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
Darmstadt	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
912B2:										
Hoyleton	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
Darmstadt	Fair	Good	Very poor	Good	Good	Poor	Very poor	Fair	Fair	Very poor
914C2:										
Atlas	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
Grantfork	Fair	Good	Good	Good	Good	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
929D2:										
Ava	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
Hickory	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
947D2:										
Hickory	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
Passport	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
947D3:										
Hickory	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
Passport	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
967F:										
Hickory	Very poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor
Gosport	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor
991A:										
Cisne	Poor	Fair	Fair	Fair	Poor	Good	Good	Fair	Fair	Good
Huey	Poor	Fair	Very poor	Fair	Poor	Good	Good	Poor	Fair	Good
1524A:										
Zipp	Poor	Poor	Poor	Poor	Very poor	Good	Good	Poor	Poor	Good
3072A:										
Sharon	Poor	Fair	Fair	Good	Fair	Fair	Poor	Fair	Good	Poor
3108A:										
Bonnie	Poor	Fair	Fair	Fair	Poor	Good	Good	Fair	Fair	Good
3108T:										
Bonnie	Poor	Fair	Fair	Fair	Poor	Good	Good	Fair	Fair	Good
3225A:										
Holton	Poor	Fair	Fair	Good	Fair	Good	Fair	Fair	Good	Fair
3226A:										
Wirt	Poor	Fair	Fair	Good	Fair	Fair	Very poor	Fair	Good	Poor
3333A:										
Wakeland	Poor	Fair	Fair	Good	Fair	Good	Fair	Fair	Good	Fair
3334A:										
Birds	Poor	Fair	Fair	Fair	Poor	Good	Good	Fair	Fair	Good

Table 13.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herba-ceous plants	Hardwood trees	Conif-erous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
3382A:										
Belknap-----------	Poor	Fair	Fair	Good	Fair	Good	Fair	Fair	Good	Fair
3415A:										
Orion-------------	Poor	Fair	Fair	Good	Fair	Good	Fair	Fair	Good	Fair
7337B:										
Creal-------------	Fair	Good	Fair	Good	Good	Fair	Poor	Fair	Good	Poor
8787A:										
Banlic------------	Fair	Good	Fair	Good	Good	Fair	Fair	Fair	Good	Fair

Table 14a.--Building Site Development

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2A:							
Cisne---------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Ponding	1.00	Shrink-swell	1.00
		Ponding	1.00	Shrink-swell	0.01	Ponding	1.00
3A:							
Hoyleton------------	90	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Depth to saturated zone	1.00	Shrink-swell	1.00
		Depth to saturated zone	0.88			Depth to saturated zone	0.88
3B:							
Hoyleton------------	90	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Depth to saturated zone	1.00	Shrink-swell	1.00
		Depth to saturated zone	0.39			Depth to saturated zone	0.39
3B2:							
Hoyleton------------	90	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Depth to saturated zone	1.00	Shrink-swell	1.00
		Depth to saturated zone	0.39			Depth to saturated zone	0.39
4B:							
Richview------------	92	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Depth to saturated zone	0.99	Shrink-swell	0.50
				Shrink-swell	0.50		
4C2:							
Richview------------	92	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Depth to saturated zone	0.99	Slope	1.00
		Slope	0.01	Shrink-swell	0.50	Shrink-swell	0.50
				Slope	0.01		
5C3:							
Blair---------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.01	Shrink-swell	0.01	Slope	0.50
						Shrink-swell	0.01
7C2:							
Atlas---------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.94	Shrink-swell	0.22	Shrink-swell	0.94
						Slope	0.88

Table 14a.--Building Site Development--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
7C3:							
Atlas---------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.04	Slope	0.04	Shrink-swell	0.50
7D2:							
Atlas---------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope	1.00
		Shrink-swell	0.94	Shrink-swell	0.94	Depth to saturated zone	1.00
		Slope	0.63	Slope	0.63	Shrink-swell	0.94
7D3:							
Atlas---------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope	1.00
		Shrink-swell	0.94	Shrink-swell	0.94	Depth to saturated zone	1.00
		Slope	0.84	Slope	0.84	Shrink-swell	0.94
8D3:							
Hickory-------------	90	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.96	Slope	0.96	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
8F:							
Hickory-------------	91	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
8G:							
Hickory-------------	95	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Shrink-swell	0.04	Shrink-swell	0.04	Shrink-swell	0.04
10C:							
Plumfield-----------	90	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.01	Depth to saturated zone	0.99	Slope	1.00
				Shrink-swell	0.50		
				Slope	0.01		
12A:							
Wynoose-------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Ponding	1.00	Shrink-swell	1.00
		Ponding	1.00	Shrink-swell	0.06	Ponding	1.00
13A:							
Bluford-------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	0.50	Shrink-swell	1.00

Table 14a.--Building Site Development--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
13B:							
Bluford-------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	0.50	Shrink-swell	1.00
13B2:							
Bluford-------------	90	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Depth to saturated zone	1.00	Shrink-swell	1.00
		Depth to saturated zone	0.95	Shrink-swell	1.00	Depth to saturated zone	0.95
14B:							
Ava-----------------	90	Somewhat limited		Very limited		Somewhat limited	
		Shrink-swell	0.14	Depth to saturated zone	1.00	Shrink-swell	0.14
		Depth to saturated zone	0.07	Shrink-swell	0.14	Depth to saturated zone	0.07
14C2:							
Ava-----------------	90	Somewhat limited		Very limited		Very limited	
		Shrink-swell	0.14	Depth to saturated zone	1.00	Slope	1.00
		Depth to saturated zone	0.07	Shrink-swell	0.14	Shrink-swell	0.14
		Slope	0.01	Slope	0.01	Depth to saturated zone	0.07
15B2:							
Parke---------------	90	Not limited		Not limited		Not limited	
109A:							
Racoon--------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
				Shrink-swell	0.68		
120A:							
Huey----------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Shrink-swell	0.62	Shrink-swell	0.62	Shrink-swell	0.62
218A:							
Newberry------------	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Shrink-swell	1.00	Ponding	1.00
		Shrink-swell	0.62	Ponding	1.00	Shrink-swell	0.62
421G:							
Kell----------------	90	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Shrink-swell	0.06	Depth to soft bedrock	0.10	Shrink-swell	0.06
				Shrink-swell	0.06		
533:							
Urban land----------	90	Not rated		Not rated		Not rated	

Table 14a.--Building Site Development--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
551D2:							
Gosport-------------	90	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Slope	1.00
		Slope	0.63	Depth to saturated zone	0.95	Shrink-swell	1.00
				Slope	0.63		
				Depth to soft bedrock	0.15		
551F:							
Gosport-------------	90	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
				Depth to saturated zone	0.95		
				Depth to soft bedrock	0.29		
551G:							
Gosport-------------	90	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
				Depth to saturated zone	0.95		
				Depth to soft bedrock	0.15		
581A:							
Tamalco-------------	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.82	Depth to saturated zone	0.99	Shrink-swell	0.82
652C2:							
Passport------------	90	Somewhat limited		Very limited		Somewhat limited	
		Depth to saturated zone	0.98	Depth to saturated zone	1.00	Depth to saturated zone	0.98
		Shrink-swell	0.01	Shrink-swell	0.01	Slope	0.12
						Shrink-swell	0.01
652D2:							
Passport------------	90	Very limited		Very limited		Very limited	
		Too steep	1.00	Depth to saturated zone	1.00	Slope	1.00
		Depth to saturated zone	0.98	Too steep	1.00	Depth to saturated zone	0.98
		Shrink-swell	0.01	Shrink-swell	0.01	Shrink-swell	0.01
801B:							
Orthents------------	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
810:							
Oil-waste land------	80	Not rated		Not rated		Not rated	
888C2:							
Passport------------	50	Somewhat limited		Very limited		Somewhat limited	
		Depth to saturated zone	0.98	Depth to saturated zone	1.00	Depth to saturated zone	0.98
		Shrink-swell	0.01	Shrink-swell	0.01	Slope	0.12
						Shrink-swell	0.01

Table 14a.--Building Site Development--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
888C2:							
Grantfork-----------	35	Somewhat limited		Very limited		Very limited	
		Depth to saturated zone	0.98	Depth to saturated zone	1.00	Slope	1.00
		Slope	0.04	Slope	0.04	Depth to saturated zone	0.98
		Shrink-swell	0.01	Shrink-swell	0.01	Shrink-swell	0.01
908D2:							
Hickory-------------	60	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.96	Slope	0.96	Slope	1.00
		Shrink-swell	0.04	Shrink-swell	0.04	Shrink-swell	0.04
Kell----------------	30	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Shrink-swell	0.06	Shrink-swell	0.06	Shrink-swell	0.06
				Depth to soft bedrock	0.01		
908F:							
Hickory-------------	55	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Shrink-swell	0.04	Shrink-swell	0.04	Shrink-swell	0.04
Kell----------------	35	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Shrink-swell	0.06	Depth to soft bedrock	0.10	Shrink-swell	0.06
				Shrink-swell	0.06		
912A:							
Hoyleton------------	50	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Depth to saturated zone	1.00	Shrink-swell	1.00
		Depth to saturated zone	0.88			Depth to saturated zone	0.88
Darmstadt-----------	40	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.82	Shrink-swell	0.82	Shrink-swell	0.82
912B:							
Hoyleton------------	50	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Depth to saturated zone	1.00	Shrink-swell	1.00
		Depth to saturated zone	0.39			Depth to saturated zone	0.39
Darmstadt-----------	40	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.06	Shrink-swell	0.06	Shrink-swell	0.06
912B2:							
Hoyleton------------	50	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Depth to saturated zone	1.00	Shrink-swell	1.00
		Depth to saturated zone	0.39			Depth to saturated zone	0.39

Table 14a.--Building Site Development--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
912B2:							
Darmstadt	40	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.06	Shrink-swell	0.06	Shrink-swell	0.06
914C2:							
Atlas	50	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.94	Shrink-swell	0.50	Shrink-swell	0.94
						Slope	0.88
Grantfork	40	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
						Slope	0.88
929D2:							
Ava	55	Somewhat limited		Very limited		Very limited	
		Slope	0.37	Depth to saturated zone	1.00	Slope	1.00
		Shrink-swell	0.14	Shrink-swell	0.50	Shrink-swell	0.14
		Depth to saturated zone	0.07	Slope	0.37	Depth to saturated zone	0.07
Hickory	40	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Shrink-swell	0.04	Shrink-swell	0.04	Shrink-swell	0.04
947D2:							
Hickory	45	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Shrink-swell	0.04	Shrink-swell	0.04	Shrink-swell	0.04
Passport	40	Somewhat limited		Very limited		Very limited	
		Depth to saturated zone	0.98	Depth to saturated zone	1.00	Slope	1.00
		Slope	0.63	Slope	0.63	Depth to saturated zone	0.98
		Shrink-swell	0.01	Shrink-swell	0.01	Shrink-swell	0.01
947D3:							
Hickory	45	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Shrink-swell	0.04	Shrink-swell	0.04	Shrink-swell	0.04
Passport	40	Somewhat limited		Very limited		Very limited	
		Depth to saturated zone	0.98	Depth to saturated zone	1.00	Slope	1.00
		Slope	0.63	Slope	0.63	Depth to saturated zone	0.98
		Shrink-swell	0.01	Shrink-swell	0.01	Shrink-swell	0.01
967F:							
Hickory	50	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50

Table 14a.--Building Site Development--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
967F:							
Gosport	35	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
				Depth to saturated zone	0.95		
				Depth to soft bedrock	0.29		
991A:							
Cisne	50	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Ponding	1.00	Shrink-swell	1.00
		Ponding	1.00	Shrink-swell	0.01	Ponding	1.00
Huey	40	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Shrink-swell	0.62	Shrink-swell	0.62	Shrink-swell	0.62
1524A:							
Zipp	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
3072A:							
Sharon	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
				Depth to saturated zone	0.98		
3108A:							
Bonnie	90	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
3108T:							
Bonnie	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
3225A:							
Holton	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
3226A:							
Wirt	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00

Table 14a.--Building Site Development--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
3333A:							
Wakeland------------	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
3334A:							
Birds---------------	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
3382A:							
Belknap-------------	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
3415A:							
Orion---------------	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.95	Depth to saturated zone	1.00	Depth to saturated zone	0.95
7337B:							
Creal---------------	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.98	Depth to saturated zone	1.00	Depth to saturated zone	0.98
8787A:							
Banlic--------------	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00

Table 14b.--Building Site Development

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2A:							
Cisne	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Ponding	1.00	Ponding	1.00
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	1.00				
		Ponding	1.00				
3A:							
Hoyleton	90	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.56
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	1.00				
		Depth to saturated zone	0.56				
3B:							
Hoyleton	90	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.19
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	1.00				
		Depth to saturated zone	0.19				
3B2:							
Hoyleton	90	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.19
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	1.00				
		Depth to saturated zone	0.19				
4B:							
Richview	92	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Depth to saturated zone	0.99		
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
4C2:							
Richview	92	Very limited		Somewhat limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	0.99	Slope	0.01
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50	Slope	0.01		
		Slope	0.01				
5C3:							
Blair	90	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.99
		Low strength	1.00	Cutbanks cave	0.10		
		Depth to saturated zone	0.99				
		Shrink-swell	0.01				

Table 14b.--Building Site Development--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
7C2:							
Atlas---------------	90	Very limited		Very limited		Somewhat limited	
		Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.99
		Depth to saturated zone	0.99	Cutbanks cave	0.10		
		Shrink-swell	0.94				
		Frost action	0.50				
7C3:							
Atlas---------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Cutbanks cave	0.10	Slope	0.04
		Low strength	1.00	Slope	0.04		
		Shrink-swell	0.50				
		Slope	0.04				
7D2:							
Atlas---------------	90	Very limited		Very limited		Somewhat limited	
		Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.99
		Depth to saturated zone	0.99	Slope	0.63	Slope	0.63
		Shrink-swell	0.94	Cutbanks cave	0.10		
		Slope	0.63				
		Frost action	0.50				
7D3:							
Atlas---------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Slope	0.84	Slope	0.84
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.94				
		Slope	0.84				
8D3:							
Hickory-------------	90	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Slope	0.96	Slope	0.96
		Slope	0.96	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
8F:							
Hickory-------------	91	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
8G:							
Hickory-------------	95	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Frost action	0.50	Cutbanks cave	0.10		
		Low strength	0.22				
		Shrink-swell	0.04				

Table 14b.--Building Site Development--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
10C:							
Plumfield-----------	90	Very limited		Somewhat limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	0.99	Slope	0.01
		Low strength	1.00	Cutbanks cave	0.10		
		Slope	0.01	Slope	0.01		
12A:							
Wynoose-------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Ponding	1.00	Ponding	1.00
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	1.00	Too clayey	0.01		
		Ponding	1.00				
13A:							
Bluford-------------	90	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.94
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	1.00	Too clayey	0.01		
		Depth to saturated zone	0.94				
13B:							
Bluford-------------	90	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.94
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	1.00	Too clayey	0.01		
		Depth to saturated zone	0.94				
13B2:							
Bluford-------------	90	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.68
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	1.00				
		Depth to saturated zone	0.68				
14B:							
Ava-----------------	90	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.03
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.14				
		Depth to saturated zone	0.03				
14C2:							
Ava-----------------	90	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.03
		Low strength	1.00	Cutbanks cave	0.10	Slope	0.01
		Shrink-swell	0.14	Slope	0.01		
		Depth to saturated zone	0.03				
		Slope	0.01				

Table 14b.--Building Site Development--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
15B2:							
Parke----------------	90	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
		Low strength	1.00				
109A:							
Racoon--------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Ponding	1.00	Ponding	1.00
		Low strength	1.00	Cutbanks cave	0.10		
		Ponding	1.00				
120A:							
Huey----------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Sodium content	1.00
						Depth to saturated zone	1.00
		Frost action	1.00	Ponding	1.00		
		Low strength	1.00	Cutbanks cave	0.10	Ponding	1.00
		Ponding	1.00				
		Shrink-swell	0.62				
218A:							
Newberry------------	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Ponding	1.00	Ponding	1.00
		Low strength	1.00	Cutbanks cave	0.10		
		Ponding	1.00				
		Shrink-swell	0.62				
421G:							
Kell----------------	90	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Low strength	1.00	Dense layer	0.50	Depth to bedrock	0.10
		Frost action	0.50	Cutbanks cave	0.10		
		Shrink-swell	0.06	Depth to soft bedrock	0.10		
533:							
Urban land----------	90	Not rated		Not rated		Not rated	
551D2:							
Gosport-------------	90	Very limited		Somewhat limited		Somewhat limited	
		Shrink-swell	1.00	Depth to saturated zone	0.95	Slope	0.63
		Low strength	1.00			Depth to bedrock	0.16
		Slope	0.63	Slope	0.63		
		Frost action	0.50	Too clayey	0.50		
				Depth to soft bedrock	0.15		
				Cutbanks cave	0.10		

Table 14b.--Building Site Development--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
551F:							
Gosport-------------	90	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Shrink-swell	1.00	Depth to saturated zone	0.95	Depth to bedrock	0.29
		Low strength	1.00	Too clayey	0.50		
		Frost action	0.50	Depth to soft bedrock	0.29		
				Cutbanks cave	0.10		
551G:							
Gosport-------------	90	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Shrink-swell	1.00	Depth to saturated zone	0.95	Depth to bedrock	0.16
		Low strength	1.00	Too clayey	0.50		
		Frost action	0.50	Depth to soft bedrock	0.15		
				Cutbanks cave	0.10		
581A:							
Tamalco-------------	90	Very limited		Somewhat limited		Very limited	
		Frost action	1.00	Depth to saturated zone	0.99	Sodium content	1.00
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.82				
652C2:							
Passport------------	90	Very limited		Very limited		Somewhat limited	
		Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
		Depth to saturated zone	0.75	Cutbanks cave	0.10		
		Frost action	0.50				
		Shrink-swell	0.01				
652D2:							
Passport------------	90	Very limited		Very limited		Very limited	
		Too steep	1.00	Depth to saturated zone	1.00	Too steep	1.00
		Low strength	1.00	Too steep	1.00	Depth to saturated zone	0.75
		Depth to saturated zone	0.75	Cutbanks cave	0.10		
		Frost action	0.50				
		Shrink-swell	0.01				
801B:							
Orthents------------	90	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
810:							
Oil-waste land------	80	Not rated		Not rated		Not rated	
888C2:							
Passport------------	50	Very limited		Very limited		Somewhat limited	
		Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
		Depth to saturated zone	0.75	Cutbanks cave	0.10		
		Frost action	0.50				
		Shrink-swell	0.01				

Table 14b.--Building Site Development--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
888C2:							
Grantfork-----------	35	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
		Low strength	1.00	Cutbanks cave	0.10	Slope	0.04
		Depth to saturated zone	0.75	Slope	0.04		
		Slope	0.04				
		Shrink-swell	0.01				
908D2:							
Hickory-------------	60	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.96	Slope	0.96	Slope	0.96
		Frost action	0.50	Cutbanks cave	0.10		
		Low strength	0.22				
		Shrink-swell	0.04				
Kell----------------	30	Very limited		Very limited		Very limited	
		Too steep	1.00	Cutbanks cave	1.00	Too steep	1.00
		Low strength	1.00	Too steep	1.00	Depth to bedrock	0.01
		Frost action	0.50	Dense layer	0.50		
		Shrink-swell	0.06	Depth to soft bedrock	0.01		
908F:							
Hickory-------------	55	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Frost action	0.50	Cutbanks cave	0.10		
		Low strength	0.22				
		Shrink-swell	0.04				
Kell----------------	35	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Low strength	1.00	Dense layer	0.50	Depth to bedrock	0.10
		Frost action	0.50	Cutbanks cave	0.10		
		Shrink-swell	0.06	Depth to soft bedrock	0.10		
912A:							
Hoyleton------------	50	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.56
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	1.00				
		Depth to saturated zone	0.56				
Darmstadt-----------	40	Very limited		Very limited		Very limited	
		Frost action	1.00	Depth to saturated zone	1.00	Sodium content	1.00
		Low strength	1.00	Cutbanks cave	0.10	Depth to saturated zone	0.88
		Depth to saturated zone	0.88				
		Shrink-swell	0.82				
912B:							
Hoyleton------------	50	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.19
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	1.00				
		Depth to saturated zone	0.19				

Table 14b.--Building Site Development--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
912B:							
Darmstadt-----------	40	Very limited		Very limited		Very limited	
		Frost action	1.00	Depth to saturated zone	1.00	Sodium content	1.00
		Low strength	1.00	Cutbanks cave	0.10	Depth to saturated zone	0.88
		Depth to saturated zone	0.88				
		Shrink-swell	0.06				
912B2:							
Hoyleton------------	50	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.19
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	1.00				
		Depth to saturated zone	0.19				
Darmstadt-----------	40	Very limited		Very limited		Very limited	
		Frost action	1.00	Depth to saturated zone	1.00	Sodium content	1.00
		Low strength	1.00	Cutbanks cave	0.10	Depth to saturated zone	0.88
		Depth to saturated zone	0.88				
		Shrink-swell	0.06				
914C2:							
Atlas---------------	50	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.99
		Low strength	1.00	Cutbanks cave	0.10		
		Depth to saturated zone	0.99				
		Shrink-swell	0.94				
Grantfork-----------	40	Very limited		Very limited		Somewhat limited	
		Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.99
		Shrink-swell	1.00	Cutbanks cave	0.10		
		Depth to saturated zone	0.99				
		Frost action	0.50				
929D2:							
Ava-----------------	55	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	1.00	Slope	0.37
		Low strength	1.00	Slope	0.37	Depth to saturated zone	0.03
		Slope	0.37	Cutbanks cave	0.10		
		Shrink-swell	0.14				
		Depth to saturated zone	0.03				
Hickory-------------	40	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Frost action	0.50	Cutbanks cave	0.10		
		Low strength	0.22				
		Shrink-swell	0.04				
947D2:							
Hickory-------------	45	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Frost action	0.50	Cutbanks cave	0.10		
		Low strength	0.22				
		Shrink-swell	0.04				

Table 14b.--Building Site Development--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
947D2:							
Passport------------	40	Very limited		Very limited		Somewhat limited	
		Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
		Depth to saturated zone	0.75	Slope	0.63	Slope	0.63
		Slope	0.63	Cutbanks cave	0.10		
		Frost action	0.50				
		Shrink-swell	0.01				
947D3:							
Hickory-------------	45	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Frost action	0.50	Cutbanks cave	0.10		
		Low strength	0.22				
		Shrink-swell	0.04				
Passport------------	40	Very limited		Very limited		Somewhat limited	
		Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
		Depth to saturated zone	0.75	Slope	0.63	Slope	0.63
		Slope	0.63	Cutbanks cave	0.10		
		Frost action	0.50				
		Shrink-swell	0.01				
967F:							
Hickory-------------	50	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Gosport-------------	35	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Shrink-swell	1.00	Depth to saturated zone	0.95	Depth to bedrock	0.29
		Low strength	1.00	Too clayey	0.50		
		Frost action	0.50	Depth to soft bedrock	0.29		
				Cutbanks cave	0.10		
991A:							
Cisne---------------	50	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Ponding	1.00	Ponding	1.00
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	1.00				
		Ponding	1.00				
Huey----------------	40	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Sodium content	1.00
		Frost action	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Low strength	1.00	Cutbanks cave	0.10	Ponding	1.00
		Ponding	1.00				
		Shrink-swell	0.62				

Table 14b.--Building Site Development--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
1524A:							
Zipp	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Frost action	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Flooding	0.80	Ponding	1.00
		Low strength	1.00	Too clayey	0.32	Droughty	0.16
		Shrink-swell	1.00	Cutbanks cave	0.10		
3072A:							
Sharon	90	Very limited		Somewhat limited		Very limited	
		Frost action	1.00	Depth to saturated zone	0.98	Flooding	1.00
		Flooding	1.00	Flooding	0.80		
		Low strength	0.78	Cutbanks cave	0.10		
3108A:							
Bonnie	90	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Frost action	1.00	Flooding	0.80	Depth to saturated zone	1.00
		Flooding	1.00	Cutbanks cave	0.10		
		Low strength	1.00				
3108T:							
Bonnie	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Frost action	1.00	Ponding	1.00	Sodium content	1.00
		Flooding	1.00	Flooding	0.80	Depth to saturated zone	1.00
		Low strength	1.00	Cutbanks cave	0.10	Ponding	1.00
		Ponding	1.00				
3225A:							
Holton	90	Very limited		Very limited		Very limited	
		Frost action	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Flooding	1.00	Flooding	0.80	Depth to saturated zone	0.96
		Depth to saturated zone	0.96	Cutbanks cave	0.10		
3226A:							
Wirt	90	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Flooding	0.80	Flooding	1.00
		Frost action	0.50	Cutbanks cave	0.10		
3333A:							
Wakeland	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Frost action	1.00	Flooding	0.80	Depth to saturated zone	1.00
		Flooding	1.00	Cutbanks cave	0.10		

Table 14b.--Building Site Development--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
3334A:							
Birds	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Frost action	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Flooding	0.80	Ponding	1.00
		Low strength	1.00	Cutbanks cave	0.10		
		Ponding	1.00				
3382A:							
Belknap	90	Very limited		Very limited		Very limited	
		Frost action	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Flooding	1.00	Flooding	0.80	Depth to saturated zone	0.99
		Low strength	1.00	Cutbanks cave	0.10		
		Depth to saturated zone	0.99				
3415A:							
Orion	90	Very limited		Very limited		Very limited	
		Frost action	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Flooding	1.00	Flooding	0.80	Depth to saturated zone	0.68
		Low strength	0.78	Cutbanks cave	0.10		
		Depth to saturated zone	0.68				
7337B:							
Creal	90	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
		Low strength	1.00	Cutbanks cave	0.10		
		Depth to saturated zone	0.75				
		Flooding	0.40				
8787A:							
Banlic	90	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.99
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Depth to saturated zone	0.99	Cutbanks cave	0.10		
		Low strength	0.78				

Table 15a.--Sanitary Facilities

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2A:					
Cisne	90	Very limited		Very limited	
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00		
3A:					
Hoyleton	90	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00		
3B:					
Hoyleton	90	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slope	0.08
3B2:					
Hoyleton	90	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slope	0.08
4B:					
Richview	92	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.46	Seepage	0.53
4C2:					
Richview	92	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Seepage, bottom layer	1.00	Slope	1.00
		Slow water movement	0.46	Seepage	0.53
		Slope	0.01		
5C3:					
Blair	90	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slope	0.92

Table 15a.--Sanitary Facilities--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
7C2:					
Atlas---------------	90	Very limited		Very limited	
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Slope	1.00
7C3:					
Atlas---------------	90	Very limited		Very limited	
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Slope	1.00
		Slope	0.04		
7D2:					
Atlas---------------	90	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slope	0.63		
7D3:					
Atlas---------------	90	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slope	0.84		
8D3:					
Hickory-------------	90	Somewhat limited		Very limited	
		Slope	0.96	Slope	1.00
		Slow water movement	0.46	Seepage	0.53
8F:					
Hickory-------------	91	Very limited		Very limited	
		Too steep	1.00	Slope	1.00
		Slow water movement	1.00	Seepage	0.53
8G:					
Hickory-------------	95	Very limited		Very limited	
		Too steep	1.00	Slope	1.00
		Slow water movement	1.00	Seepage	0.53
10C:					
Plumfield-----------	90	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	0.17
		Slope	0.01		

Table 15a.--Sanitary Facilities--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
12A:					
Wynoose	90	Very limited		Very limited	
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00		
13A:					
Bluford	90	Very limited		Very limited	
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00		
13B:					
Bluford	90	Very limited		Very limited	
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Slope	0.08
13B2:					
Bluford	90	Very limited		Somewhat limited	
		Slow water movement	1.00	Depth to saturated zone	0.99
		Depth to saturated zone	1.00	Slope	0.08
14B:					
Ava	90	Very limited		Somewhat limited	
		Slow water movement	1.00	Seepage	0.53
		Depth to saturated zone	1.00	Depth to saturated zone	0.44
				Slope	0.08
14C2:					
Ava	90	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	0.44
		Slope	0.01		
15B2:					
Parke	90	Somewhat limited		Somewhat limited	
		Slow water movement	0.46	Seepage	0.53
				Slope	0.08
109A:					
Racoon	90	Very limited		Very limited	
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00		

Table 15a.--Sanitary Facilities--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
120A:					
Huey----------------	90	Very limited		Very limited	
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00		
218A:					
Newberry------------	95	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Ponding	1.00
		Ponding	1.00		
421G:					
Kell----------------	90	Very limited		Very limited	
		Too steep	1.00	Depth to soft bedrock	1.00
		Depth to bedrock	1.00	Slope	1.00
		Slow water movement	1.00	Seepage	0.53
533:					
Urban land----------	90	Not rated		Not rated	
551D2:					
Gosport-------------	90	Very limited		Very limited	
		Slow water movement	1.00	Depth to soft bedrock	1.00
		Depth to saturated zone	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to saturated zone	1.00
		Slope	0.63		
551F:					
Gosport-------------	90	Very limited		Very limited	
		Slow water movement	1.00	Depth to soft bedrock	1.00
		Depth to saturated zone	1.00	Slope	1.00
		Too steep	1.00	Depth to saturated zone	1.00
		Depth to bedrock	1.00		
551G:					
Gosport-------------	90	Very limited		Very limited	
		Slow water movement	1.00	Depth to soft bedrock	1.00
		Depth to saturated zone	1.00	Slope	1.00
		Too steep	1.00	Depth to saturated zone	1.00
		Depth to bedrock	1.00		
581A:					
Tamalco-------------	90	Very limited		Very limited	
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00		

Table 15a.--Sanitary Facilities--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
652C2:					
Passport-----------	90	Very limited		Very limited	
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Slope	0.68
652D2:					
Passport-----------	90	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too steep	1.00		
801B:					
Orthents-----------	90	Somewhat limited		Somewhat limited	
		Slow water movement	0.72	Slope	0.32
				Seepage	0.28
810:					
Oil-waste land------	80	Not rated		Not rated	
888C2:					
Passport-----------	50	Very limited		Very limited	
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Slope	0.68
Grantfork-----------	35	Very limited		Very limited	
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Slope	1.00
		Slope	0.04		
908D2:					
Hickory------------	60	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Slope	0.96	Seepage	0.53
Kell----------------	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Too steep	1.00	Slope	1.00
		Slow water movement	0.46	Seepage	0.53
908F:					
Hickory------------	55	Very limited		Very limited	
		Too steep	1.00	Slope	1.00
		Slow water movement	1.00	Seepage	0.53
Kell----------------	35	Very limited		Very limited	
		Too steep	1.00	Depth to soft bedrock	1.00
		Depth to bedrock	1.00	Slope	1.00
		Slow water movement	1.00	Seepage	0.53

Table 15a.--Sanitary Facilities--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
912A:					
Hoyleton------------	50	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00		
Darmstadt-----------	40	Very limited		Very limited	
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00		
912B:					
Hoyleton------------	50	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slope	0.08
Darmstadt-----------	40	Very limited		Very limited	
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Slope	0.08
912B2:					
Hoyleton------------	50	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slope	0.08
Darmstadt-----------	40	Very limited		Very limited	
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Slope	0.32
914C2:					
Atlas---------------	50	Very limited		Very limited	
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Slope	1.00
Grantfork-----------	40	Very limited		Very limited	
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Slope	1.00
929D2:					
Ava-----------------	55	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	0.44
		Slope	0.37		

Table 15a.--Sanitary Facilities--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
929D2:					
Hickory-------------	40	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
				Seepage	0.53
		Too steep	1.00		
947D2:					
Hickory-------------	45	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
				Seepage	0.53
		Too steep	1.00		
Passport------------	40	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
				Depth to saturated zone	1.00
		Depth to saturated zone	1.00		
		Slope	0.63		
947D3:					
Hickory-------------	45	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
				Seepage	0.53
		Too steep	1.00		
Passport------------	40	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
				Depth to saturated zone	1.00
		Depth to saturated zone	1.00		
		Slope	0.63		
967F:					
Hickory-------------	50	Very limited		Very limited	
		Too steep	1.00	Slope	1.00
		Slow water movement	1.00	Seepage	0.53
Gosport-------------	35	Very limited		Very limited	
		Slow water movement	1.00	Depth to soft bedrock	1.00
		Depth to saturated zone	1.00	Slope	1.00
				Depth to saturated zone	1.00
		Too steep	1.00		
		Depth to bedrock	1.00		
991A:					
Cisne---------------	50	Very limited		Very limited	
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00		
Huey----------------	40	Very limited		Very limited	
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00		

Table 15a.--Sanitary Facilities--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
1524A:					
Zipp	90	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00		
3072A:					
Sharon	90	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.46	Seepage	0.53
3108A:					
Bonnie	90	Very limited		Very limited	
		Flooding	1.00	Ponding	1.00
		Ponding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00		
3108T:					
Bonnie	90	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00		
3225A:					
Holton	90	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Slow water movement	0.46		
3226A:					
Wirt	90	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Slow water movement	0.46		
3333A:					
Wakeland	90	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.46	Seepage	0.53

Table 15a.--Sanitary Facilities--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
3334A:					
Birds	90	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Ponding	1.00
		Ponding	1.00		
3382A:					
Belknap	90	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.72	Seepage	0.54
3415A:					
Orion	90	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.46	Seepage	0.53
7337B:					
Creal	90	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Flooding	0.40
		Flooding	0.40		
8787A:					
Banlic	90	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00		

Table 15b.--Sanitary Facilities

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
2A:							
Cisne---------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Too clayey	0.50			Too clayey	0.50
3A:							
Hoyleton------------	90	Very limited		Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.98
						Too clayey	0.50
3B:							
Hoyleton------------	90	Very limited		Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.86
3B2:							
Hoyleton------------	90	Very limited		Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.86
4B:							
Richview------------	92	Very limited		Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
		Too clayey	0.50			Depth to saturated zone	0.24
4C2:							
Richview------------	92	Very limited		Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
		Seepage, bottom layer	1.00	Slope	0.01	Depth to saturated zone	0.24
		Too clayey	0.50			Slope	0.01
		Slope	0.01				
5C3:							
Blair---------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	0.50			Too clayey	0.50
7C2:							
Atlas---------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	0.50			Too clayey	0.50

Table 15b.--Sanitary Facilities--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
7C3:							
Atlas	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	0.50	Slope	0.04	Too clayey	0.50
		Slope	0.04			Slope	0.04
7D2:							
Atlas	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50			Too clayey	0.50
7D3:							
Atlas	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slope	0.84	Slope	0.84	Slope	0.84
		Too clayey	0.50			Too clayey	0.50
8D3:							
Hickory	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.96	Slope	0.96	Slope	0.96
		Too clayey	0.50			Too clayey	0.50
8F:							
Hickory	91	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Too clayey	0.50			Too clayey	0.50
8G:							
Hickory	95	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Too clayey	0.50			Too clayey	0.50
10C:							
Plumfield	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.84	Depth to saturated zone	0.17	Depth to saturated zone	0.44
		Too clayey	0.50	Slope	0.01	Slope	0.01
		Slope	0.01				
12A:							
Wynoose	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Too clayey	0.50			Too clayey	0.50
13A:							
Bluford	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	0.50			Too clayey	0.50

Table 15b.--Sanitary Facilities--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
13B:							
Bluford	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	0.50			Too clayey	0.50
13B2:							
Bluford	90	Very limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	0.99	Depth to saturated zone	0.99
		Too clayey	0.50			Too clayey	0.50
14B:							
Ava	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.95	Depth to saturated zone	0.44	Depth to saturated zone	0.68
		Too clayey	0.50			Too clayey	0.50
14C2:							
Ava	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.95	Depth to saturated zone	0.44	Depth to saturated zone	0.68
		Too clayey	0.50	Slope	0.01	Too clayey	0.50
		Slope	0.01			Slope	0.01
15B2:							
Parke	90	Not limited		Not limited		Not limited	
109A:							
Racoon	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Too clayey	0.50			Too clayey	0.50
120A:							
Huey	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Excess sodium	1.00	Ponding	1.00	Sodium content	1.00
		Ponding	1.00			Ponding	1.00
		Too clayey	0.50			Too clayey	0.50
218A:							
Newberry	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Too clayey	0.50			Too clayey	0.50
421G:							
Kell	90	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Too clayey	0.50			Too clayey	0.50
533:							
Urban land	90	Not rated		Not rated		Not rated	

Table 15b.--Sanitary Facilities--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
551D2:							
Gosport-------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Too clayey	1.00	Slope	0.63	Slope	0.63
		Slope	0.63			Depth to saturated zone	0.11
551F:							
Gosport-------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Too steep	1.00	Too steep	1.00
		Too steep	1.00	Depth to saturated zone	1.00	Too clayey	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Too clayey	1.00			Depth to saturated zone	0.11
551G:							
Gosport-------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Too steep	1.00	Too steep	1.00
		Too steep	1.00	Depth to saturated zone	1.00	Too clayey	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Too clayey	1.00			Depth to saturated zone	0.11
581A:							
Tamalco-------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Sodium content	1.00
		Excess sodium	1.00			Depth to saturated zone	0.47
652C2:							
Passport------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	0.50			Too clayey	0.50
652D2:							
Passport------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too steep	1.00
		Too steep	1.00	Too steep	1.00	Depth to saturated zone	1.00
		Too clayey	0.50			Too clayey	0.50
801B:							
Orthents------------	90	Not limited		Not limited		Not limited	
810:							
Oil-waste land------	80	Not rated		Not rated		Not rated	
888C2:							
Passport------------	50	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	0.50			Too clayey	0.50
Grantfork-----------	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	0.50	Slope	0.04	Too clayey	0.50
		Slope	0.04			Slope	0.04

Table 15b.--Sanitary Facilities--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
908D2:							
Hickory-------------	60	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.96	Slope	0.96	Slope	0.96
		Too clayey	0.50			Too clayey	0.50
Kell----------------	30	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Too clayey	0.50			Too clayey	0.50
908F:							
Hickory-------------	55	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Too clayey	0.50			Too clayey	0.50
Kell----------------	35	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Too clayey	0.50			Too clayey	0.50
912A:							
Hoyleton------------	50	Very limited		Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.98
						Too clayey	0.50
Darmstadt-----------	40	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Excess sodium	1.00			Sodium content	1.00
		Too clayey	0.50			Too clayey	0.50
912B:							
Hoyleton------------	50	Very limited		Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.86
Darmstadt-----------	40	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Excess sodium	1.00			Sodium content	1.00
		Too clayey	0.50			Too clayey	0.50
912B2:							
Hoyleton------------	50	Very limited		Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.86
Darmstadt-----------	40	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Excess sodium	1.00			Sodium content	1.00
		Too clayey	0.50			Too clayey	0.50
914C2:							
Atlas---------------	50	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	0.50			Too clayey	0.50

Table 15b.--Sanitary Facilities--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
914C2:							
Grantfork-----------	40	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	0.50			Too clayey	0.50
929D2:							
Ava-----------------	55	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.95	Depth to saturated zone	0.44	Depth to saturated zone	0.68
		Too clayey	0.50	Slope	0.37	Too clayey	0.50
		Slope	0.37			Slope	0.37
Hickory-------------	40	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Too clayey	0.50			Too clayey	0.50
947D2:							
Hickory-------------	45	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Too clayey	0.50			Too clayey	0.50
Passport------------	40	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50			Too clayey	0.50
947D3:							
Hickory-------------	45	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Too clayey	0.50			Too clayey	0.50
Passport------------	40	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50			Too clayey	0.50
967F:							
Hickory-------------	50	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Too clayey	0.50			Too clayey	0.50
Gosport-------------	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Too steep	1.00	Too steep	1.00
		Too steep	1.00	Depth to saturated zone	1.00	Too clayey	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Too clayey	1.00			Depth to saturated zone	0.11
991A:							
Cisne---------------	50	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Too clayey	0.50			Too clayey	0.50

Table 15b.--Sanitary Facilities--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
991A:							
Huey	40	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Excess sodium	1.00	Ponding	1.00	Sodium content	1.00
		Ponding	1.00			Ponding	1.00
		Too clayey	0.50			Too clayey	0.50
1524A:							
Zipp	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	1.00
		Too clayey	1.00	Ponding	1.00	Hard to compact	1.00
		Ponding	1.00			Ponding	1.00
3072A:							
Sharon	90	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	0.20
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
3108A:							
Bonnie	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Depth to saturated zone	1.00		
3108T:							
Bonnie	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Sodium content	1.00
		Excess sodium	1.00	Ponding	1.00	Ponding	1.00
		Ponding	1.00				
3225A:							
Holton	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Seepage	0.22
		Seepage, bottom layer	1.00	Seepage	1.00		
3226A:							
Wirt	90	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Seepage	0.22
		Seepage, bottom layer	1.00	Seepage	1.00		
3333A:							
Wakeland	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		

Table 15b.--Sanitary Facilities--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
3334A:							
Birds	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Ponding	1.00		
3382A:							
Belknap	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
3415A:							
Orion	90	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	0.99
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
7337B:							
Creal	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	0.40	Flooding	0.40		
8787A:							
Banlic	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		

Table 16a.--Construction Materials

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2A:							
Cisne---------------	90	Fair		Poor		Poor	
		Water erosion	0.06	Wetness	0.00	Wetness	0.00
		Low content of organic matter	0.12	Low strength	0.00	Too clayey	0.20
		Too clayey	0.32	Shrink-swell	0.93	Too acid	0.95
		Too acid	0.46				
3A:							
Hoyleton------------	90	Fair		Poor		Fair	
		Too clayey	0.02	Low strength	0.00	Too clayey	0.01
		Low content of organic matter	0.02	Wetness	0.24	Wetness	0.24
		Water erosion	0.37	Shrink-swell	0.78	Too acid	0.92
		Too acid	0.50				
3B:							
Hoyleton------------	90	Fair		Poor		Fair	
		Too clayey	0.02	Low strength	0.00	Too clayey	0.01
		Low content of organic matter	0.02	Wetness	0.53	Wetness	0.53
		Water erosion	0.37	Shrink-swell	0.91	Too acid	0.88
		Too acid	0.50				
3B2:							
Hoyleton------------	90	Fair		Poor		Fair	
		Too clayey	0.02	Low strength	0.00	Too clayey	0.01
		Low content of organic matter	0.02	Wetness	0.53	Wetness	0.53
		Too acid	0.50	Shrink-swell	0.87	Too acid	0.88
		Water erosion	0.90				
4B:							
Richview------------	92	Fair		Poor		Fair	
		Low content of organic matter	0.32	Low strength	0.00	Too acid	0.95
		Water erosion	0.37	Wetness	0.98	Wetness	0.98
		Too acid	0.39	Shrink-swell	0.99		
4C2:							
Richview------------	92	Fair		Poor		Fair	
		Low content of organic matter	0.32	Low strength	0.00	Too acid	0.95
		Water erosion	0.37	Shrink-swell	0.97	Wetness	0.98
		Too acid	0.46	Wetness	0.98		
5C3:							
Blair---------------	90	Fair		Poor		Poor	
		Low content of organic matter	0.02	Low strength	0.00	Wetness	0.00
		Too acid	0.50	Wetness	0.00		
		Water erosion	0.90	Shrink-swell	0.99		

Table 16a.--Construction Materials--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
7C2:							
Atlas---------------	90	Fair		Poor		Poor	
		Low content of organic matter	0.02	Low strength	0.00	Wetness	0.00
		Too clayey	0.08	Wetness	0.00	Too clayey	0.05
		Too acid	0.54	Shrink-swell	0.83	Too acid	0.98
		Water erosion	0.90				
7C3:							
Atlas---------------	90	Fair		Poor		Poor	
		Low content of organic matter	0.02	Wetness	0.00	Wetness	0.00
				Low strength	0.00	Too clayey	0.05
		Too clayey	0.08	Shrink-swell	0.82	Slope	0.96
		Too acid	0.61			Too acid	0.99
7D2:							
Atlas---------------	90	Fair		Poor		Poor	
		Too clayey	0.08	Low strength	0.00	Wetness	0.00
		Too acid	0.12	Wetness	0.00	Too clayey	0.05
		Low content of organic matter	0.18	Shrink-swell	0.70	Slope	0.37
						Too acid	0.59
		Water erosion	0.90				
7D3:							
Atlas---------------	90	Fair		Poor		Poor	
		Too clayey	0.08	Wetness	0.00	Wetness	0.00
		Low content of organic matter	0.18	Low strength	0.00	Too clayey	0.05
				Shrink-swell	0.76	Slope	0.16
		Too acid	0.61			Too acid	0.99
8D3:							
Hickory-------------	90	Fair		Poor		Fair	
		Low content of organic matter	0.18	Low strength	0.00	Slope	0.04
				Shrink-swell	0.97	Too clayey	0.58
		Too acid	0.68				
		Too clayey	0.98				
8F:							
Hickory-------------	91	Fair		Poor		Poor	
		Low content of organic matter	0.18	Slope	0.00	Slope	0.00
				Low strength	0.00	Too clayey	0.58
		Too acid	0.68	Shrink-swell	0.98		
		Water erosion	0.90				
		Too clayey	0.98				
8G:							
Hickory-------------	95	Fair		Poor		Poor	
		Low content of organic matter	0.08	Slope	0.00	Slope	0.00
				Low strength	0.78	Too clayey	0.55
		Too acid	0.16	Shrink-swell	0.99	Too acid	0.68
		Too clayey	0.98			Rock fragments	0.88
		Water erosion	0.99				
10C:							
Plumfield-----------	90	Fair		Poor		Fair	
		Low content of organic matter	0.02	Low strength	0.00	Wetness	0.91
				Wetness	0.91	Too acid	0.92
		Water erosion	0.37				
		Too acid	0.50				

Table 16a.--Construction Materials--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
12A:							
Wynoose-------------	90	Poor		Poor		Poor	
		Too clayey	0.00	Wetness	0.00	Wetness	0.00
		Low content of organic matter	0.05	Low strength	0.00	Too clayey	0.00
		Water erosion	0.06	Shrink-swell	0.94	Too acid	0.50
		Too acid	0.08				
13A:							
Bluford-------------	90	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Low content of organic matter	0.05	Wetness	0.04	Wetness	0.04
		Water erosion	0.37	Shrink-swell	0.88	Too acid	0.68
		Too acid	0.50				
13B:							
Bluford-------------	90	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Low content of organic matter	0.05	Wetness	0.04	Wetness	0.04
		Water erosion	0.37	Shrink-swell	0.88	Too acid	0.68
		Too acid	0.50				
13B2:							
Bluford-------------	90	Fair		Poor		Fair	
		Too clayey	0.08	Low strength	0.00	Too clayey	0.05
		Low content of organic matter	0.32	Wetness	0.18	Wetness	0.18
		Too acid	0.50	Shrink-swell	0.62	Too acid	0.76
		Water erosion	0.90				
14B:							
Ava-----------------	90	Fair		Poor		Fair	
		Water erosion	0.06	Low strength	0.00	Too clayey	0.60
		Too acid	0.20	Wetness	0.76	Wetness	0.76
		Low content of organic matter	0.24	Shrink-swell	0.98	Too acid	0.76
		Too clayey	0.98				
14C2:							
Ava-----------------	90	Fair		Poor		Fair	
		Too acid	0.39	Low strength	0.00	Too clayey	0.69
		Low content of organic matter	0.82	Wetness	0.76	Wetness	0.76
		Water erosion	0.90	Shrink-swell	0.96	Too acid	0.92
		Too clayey	0.98				
15B2:							
Parke---------------	90	Fair		Good		Fair	
		Low content of organic matter	0.02			Too acid	0.76
		Too acid	0.50				
		Water erosion	0.90				

Table 16a.--Construction Materials--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
109A:							
Racoon--------------	90	Fair		Poor		Poor	
		Low content of organic matter	0.18	Wetness	0.00	Wetness	0.00
		Too acid	0.32	Low strength	0.00	Too acid	0.95
		Water erosion	0.37	Shrink-swell	0.98		
120A:							
Huey----------------	90	Poor		Poor		Poor	
		Sodium content	0.00	Wetness	0.00	Wetness	0.00
		Water erosion	0.06	Low strength	0.00	Sodium content	0.00
		Low content of organic matter	0.08	Shrink-swell	0.91	Too clayey	0.52
		Too acid	0.84				
		Too clayey	0.92				
218A:							
Newberry------------	95	Fair		Poor		Poor	
		Low content of organic matter	0.05	Wetness	0.00	Wetness	0.00
		Water erosion	0.06	Low strength	0.00	Too clayey	0.56
		Too acid	0.16	Shrink-swell	0.91	Too acid	0.68
		Sodium content	0.90			Sodium content	0.90
		Too clayey	0.92				
421G:							
Kell----------------	90	Fair		Poor		Poor	
		Low content of organic matter	0.08	Slope	0.00	Slope	0.00
		Too acid	0.50	Depth to bedrock	0.00	Too clayey	0.55
		Droughty	0.70	Low strength	0.00	Too acid	0.68
		Depth to bedrock	0.90	Stones	0.94	Rock fragments	0.85
		Too clayey	0.98	Shrink-swell	0.99	Depth to bedrock	0.90
		Water erosion	0.99				
533:							
Urban land----------	90	Not rated		Not rated		Not rated	
551D2:							
Gosport-------------	90	Poor		Poor		Poor	
		Too clayey	0.00	Depth to bedrock	0.00	Too clayey	0.00
		Low content of organic matter	0.02	Low strength	0.00	Slope	0.37
		Droughty	0.39	Shrink-swell	0.18	Rock fragments	0.68
		Too acid	0.50	Stones	0.92	Depth to bedrock	0.84
		Depth to bedrock	0.84			Too acid	0.95
551F:							
Gosport-------------	90	Poor		Poor		Poor	
		Too clayey	0.00	Depth to bedrock	0.00	Slope	0.00
		Low content of organic matter	0.02	Low strength	0.00	Too clayey	0.00
		Droughty	0.35	Shrink-swell	0.18	Too acid	0.50
		Too acid	0.50	Slope	0.18	Rock fragments	0.68
		Depth to bedrock	0.71	Stones	0.60	Depth to bedrock	0.71
		Water erosion	0.90				

Table 16a.--Construction Materials--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
551G:							
Gosport-------------	90	Poor		Poor		Poor	
		Too clayey	0.00	Slope	0.00	Slope	0.00
		Low content of organic matter	0.02	Depth to bedrock	0.00	Too clayey	0.00
				Low strength	0.00	Too acid	0.50
		Droughty	0.42	Shrink-swell	0.18	Rock fragments	0.68
		Too acid	0.50	Stones	0.92	Depth to bedrock	0.84
		Depth to bedrock	0.84				
581A:							
Tamalco-------------	90	Fair		Fair		Poor	
		Low content of organic matter	0.02	Wetness	0.89	Sodium content	0.00
				Shrink-swell	0.90	Too clayey	0.49
		Water erosion	0.06			Wetness	0.89
		Too clayey	0.92				
		Too acid	0.95				
		Sodium content	0.97				
652C2:							
Passport------------	90	Fair		Poor		Fair	
		Low content of organic matter	0.24	Low strength	0.00	Wetness	0.14
				Wetness	0.14		
		Too acid	0.88	Shrink-swell	0.99		
		Water erosion	0.90				
652D2:							
Passport------------	90	Fair		Poor		Poor	
		Low content of organic matter	0.18	Low strength	0.00	Slope	0.00
				Wetness	0.14	Wetness	0.14
		Too acid	0.88	Shrink-swell	0.99		
		Water erosion	0.99				
801B:							
Orthents------------	90	Fair		Fair		Good	
		Low content of organic matter	0.68	Shrink-swell	0.87		
		Water erosion	0.90				
810:							
Oil-waste land------	80	Not rated		Not rated		Not rated	
888C2:							
Passport------------	50	Fair		Poor		Fair	
		Low content of organic matter	0.24	Low strength	0.00	Wetness	0.14
				Wetness	0.14		
		Too acid	0.88	Shrink-swell	0.99		
		Water erosion	0.90				
Grantfork-----------	35	Poor		Poor		Fair	
		Too alkaline	0.00	Low strength	0.00	Wetness	0.14
		Low content of organic matter	0.18	Wetness	0.14	Sodium content	0.78
				Shrink-swell	0.99	Slope	0.96
		Water erosion	0.37				
		Too acid	0.50				
		Sodium content	0.78				

Table 16a.--Construction Materials--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
908D2:							
Hickory----------	60	Fair		Fair		Fair	
		Low content of organic matter	0.08	Low strength	0.78	Slope	0.04
		Too acid	0.54	Shrink-swell	0.97	Too clayey	0.55
		Too clayey	0.98			Rock fragments	0.88
						Too acid	0.98
Kell--------------	30	Fair		Poor		Poor	
		Low content of organic matter	0.08	Depth to bedrock	0.00	Slope	0.00
		Too acid	0.50	Low strength	0.00	Too clayey	0.55
		Droughty	0.81	Slope	0.98	Rock fragments	0.88
		Too clayey	0.98	Shrink-swell	0.99	Too acid	0.88
		Depth to bedrock	0.99			Depth to bedrock	0.99
		Water erosion	0.99				
908F:							
Hickory----------	55	Fair		Poor		Poor	
		Low content of organic matter	0.08	Slope	0.00	Slope	0.00
		Too acid	0.16	Low strength	0.78	Too clayey	0.55
		Water erosion	0.68	Shrink-swell	0.99	Too acid	0.68
		Too clayey	0.98			Rock fragments	0.88
Kell--------------	35	Fair		Poor		Poor	
		Low content of organic matter	0.08	Depth to bedrock	0.00	Slope	0.00
		Too acid	0.50	Low strength	0.00	Too clayey	0.55
		Droughty	0.70	Slope	0.50	Too acid	0.68
		Depth to bedrock	0.90	Stones	0.94	Rock fragments	0.85
		Too clayey	0.98	Shrink-swell	0.99	Depth to bedrock	0.90
		Water erosion	0.99				
912A:							
Hoyleton---------	50	Fair		Poor		Fair	
		Too clayey	0.02	Low strength	0.00	Too clayey	0.01
		Low content of organic matter	0.02	Wetness	0.24	Wetness	0.24
		Water erosion	0.37	Shrink-swell	0.78	Too acid	0.92
		Too acid	0.50				
Darmstadt--------	40	Poor		Poor		Poor	
		Too alkaline	0.00	Low strength	0.00	Sodium content	0.00
		Low content of organic matter	0.02	Wetness	0.07	Wetness	0.07
		Water erosion	0.06	Shrink-swell	0.98	Too clayey	0.49
		Too clayey	0.92				
		Sodium content	0.97				
		Too acid	0.99				
912B:							
Hoyleton---------	50	Fair		Poor		Fair	
		Too clayey	0.02	Low strength	0.00	Too clayey	0.01
		Low content of organic matter	0.02	Wetness	0.53	Wetness	0.53
		Water erosion	0.37	Shrink-swell	0.91	Too acid	0.88
		Too acid	0.50				

Table 16a.--Construction Materials--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
912B:							
Darmstadt-----------	40	Poor		Poor		Fair	
		Too alkaline	0.00	Low strength	0.00	Wetness	0.07
		Low content of organic matter	0.02	Wetness	0.07	Sodium content	0.10
				Shrink-swell	0.96		
		Water erosion	0.06				
		Sodium content	0.97				
		Too acid	0.99				
912B2:							
Hoyleton------------	50	Fair		Poor		Fair	
		Too clayey	0.02	Low strength	0.00	Too clayey	0.01
		Low content of organic matter	0.02	Wetness	0.53	Wetness	0.53
				Shrink-swell	0.87	Too acid	0.88
		Too acid	0.50				
		Water erosion	0.90				
Darmstadt-----------	40	Poor		Poor		Poor	
		Sodium content	0.00	Low strength	0.00	Sodium content	0.00
		Low content of organic matter	0.02	Wetness	0.07	Wetness	0.07
				Shrink-swell	0.96		
		Water erosion	0.68				
		Too acid	0.74				
914C2:							
Atlas---------------	50	Fair		Poor		Poor	
		Low content of organic matter	0.02	Low strength	0.00	Wetness	0.00
				Wetness	0.00	Too clayey	0.05
		Too clayey	0.08	Shrink-swell	0.78	Too acid	0.98
		Too acid	0.54				
		Water erosion	0.90				
Grantfork-----------	40	Fair		Poor		Poor	
		Too clayey	0.02	Low strength	0.00	Wetness	0.00
		Low content of organic matter	0.02	Wetness	0.00	Too clayey	0.01
				Shrink-swell	0.24	Sodium content	0.78
		Sodium content	0.78				
		Water erosion	0.90				
929D2:							
Ava-----------------	55	Fair		Poor		Fair	
		Low content of organic matter	0.24	Low strength	0.00	Slope	0.63
				Wetness	0.76	Too clayey	0.69
		Too acid	0.50	Shrink-swell	0.91	Wetness	0.76
		Water erosion	0.90			Too acid	0.82
		Too clayey	0.98				
Hickory-------------	40	Fair		Fair		Poor	
		Low content of organic matter	0.08	Low strength	0.78	Slope	0.00
				Slope	0.98	Too clayey	0.55
		Too acid	0.54	Shrink-swell	0.99	Rock fragments	0.88
		Too clayey	0.98			Too acid	0.98
947D2:							
Hickory-------------	45	Fair		Fair		Poor	
		Low content of organic matter	0.08	Low strength	0.78	Slope	0.00
				Slope	0.98	Too clayey	0.55
		Too acid	0.54	Shrink-swell	0.99	Rock fragments	0.88
		Too clayey	0.98			Too acid	0.98

Table 16a.--Construction Materials--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
947D2:							
Passport	40	Fair		Poor		Fair	
		Low content of organic matter	0.18	Low strength	0.00	Wetness	0.14
		Too acid	0.88	Wetness	0.14	Slope	0.37
		Water erosion	0.99	Shrink-swell	0.99		
947D3:							
Hickory	45	Fair		Fair		Poor	
		Low content of organic matter	0.08	Low strength	0.78	Slope	0.00
		Too acid	0.54	Slope	0.98	Too clayey	0.55
		Too clayey	0.98	Shrink-swell	0.99	Rock fragments	0.88
						Too acid	0.98
Passport	40	Fair		Poor		Fair	
		Low content of organic matter	0.18	Low strength	0.00	Wetness	0.14
		Too acid	0.88	Wetness	0.14	Slope	0.37
		Water erosion	0.99	Shrink-swell	0.99		
967F:							
Hickory	50	Fair		Poor		Poor	
		Low content of organic matter	0.18	Slope	0.00	Slope	0.00
		Too acid	0.68	Low strength	0.00	Too clayey	0.58
		Water erosion	0.90	Shrink-swell	0.98		
		Too clayey	0.98				
Gosport	35	Poor		Poor		Poor	
		Too clayey	0.00	Depth to bedrock	0.00	Slope	0.00
		Low content of organic matter	0.02	Low strength	0.00	Too clayey	0.00
		Droughty	0.35	Shrink-swell	0.18	Too acid	0.50
		Too acid	0.50	Slope	0.18	Rock fragments	0.68
		Depth to bedrock	0.71	Stones	0.60	Depth to bedrock	0.71
		Water erosion	0.90				
991A:							
Cisne	50	Fair		Poor		Poor	
		Water erosion	0.06	Wetness	0.00	Wetness	0.00
		Low content of organic matter	0.12	Low strength	0.00	Too clayey	0.20
		Too clayey	0.32	Shrink-swell	0.93	Too acid	0.95
		Too acid	0.46				
Huey	40	Poor		Poor		Poor	
		Sodium content	0.00	Wetness	0.00	Wetness	0.00
		Water erosion	0.06	Low strength	0.00	Sodium content	0.00
		Low content of organic matter	0.08	Shrink-swell	0.91	Too clayey	0.52
		Too acid	0.84				
		Too clayey	0.92				
1524A:							
Zipp	90	Poor		Poor		Poor	
		Too clayey	0.00	Wetness	0.00	Wetness	0.00
		Droughty	0.83	Low strength	0.00	Too clayey	0.00
		Too acid	0.97	Shrink-swell	0.12		

Table 16a.--Construction Materials--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
3072A:							
Sharon	90	Fair		Fair		Fair	
		Water erosion	0.06	Wetness	0.99	Too acid	0.98
		Low content of organic matter	0.24			Wetness	0.99
		Too acid	0.50				
3108A:							
Bonnie	90	Fair		Poor		Poor	
		Too acid	0.50	Wetness	0.00	Wetness	0.00
		Low content of organic matter	0.50	Low strength	0.00	Too acid	0.88
		Water erosion	0.68				
3108T:							
Bonnie	90	Fair		Poor		Poor	
		Water erosion	0.06	Wetness	0.00	Wetness	0.00
		Low content of organic matter	0.18	Low strength	0.00	Sodium content	0.40
						Too acid	0.92
		Too acid	0.39				
3225A:							
Holton	90	Fair		Fair		Fair	
		Low content of organic matter	0.50	Wetness	0.02	Wetness	0.02
		Water erosion	0.90				
3226A:							
Wirt	90	Fair		Good		Good	
		Low content of organic matter	0.82				
		Water erosion	0.90				
3333A:							
Wakeland	90	Fair		Poor		Poor	
		Water erosion	0.37	Wetness	0.00	Wetness	0.00
		Low content of organic matter	0.88				
		Too acid	0.95				
3334A:							
Birds	90	Fair		Poor		Poor	
		Water erosion	0.68	Wetness	0.00	Wetness	0.00
		Low content of organic matter	0.88	Low strength	0.00		
3382A:							
Belknap	90	Fair		Poor		Fair	
		Water erosion	0.06	Low strength	0.00	Wetness	0.01
		Too acid	0.50	Wetness	0.01	Too acid	0.95
		Low content of organic matter	0.50				
3415A:							
Orion	90	Fair		Fair		Fair	
		Water erosion	0.68	Wetness	0.18	Wetness	0.18
		Too acid	0.80	Low strength	0.22		

Table 16a.--Construction Materials--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
7337B:							
Creal---------------	90	Fair		Poor		Fair	
		Too acid	0.32	Low strength	0.00	Wetness	0.14
		Low content of organic matter	0.32	Wetness	0.14		
		Water erosion	0.37				
8787A:							
Banlic--------------	90	Fair		Fair		Fair	
		Water erosion	0.06	Wetness	0.01	Wetness	0.01
		Low content of organic matter	0.50	Low strength	0.22		
		Too acid	0.54				

Table 16b.--Construction Materials

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The ratings given for the thickest layer are for the thickest layer above and excluding the bottom layer. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Potential as source of gravel		Potential as source of sand	
		Rating class	Value	Rating class	Value
2A:					
Cisne---------------	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
3A:					
Hoyleton------------	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
3B:					
Hoyleton------------	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
3B2:					
Hoyleton------------	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
4B:					
Richview------------	92	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
4C2:					
Richview------------	92	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
5C3:					
Blair---------------	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
7C2:					
Atlas---------------	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
7C3:					
Atlas---------------	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
7D2:					
Atlas---------------	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 16b.--Construction Materials--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of gravel: Rating class	Value	Potential as source of sand: Rating class	Value
7D3:					
Atlas	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
8D3:					
Hickory	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
8F:					
Hickory	91	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
8G:					
Hickory	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
10C:					
Plumfield	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
12A:					
Wynoose	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
13A:					
Bluford	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
13B:					
Bluford	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
13B2:					
Bluford	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
14B:					
Ava	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
14C2:					
Ava	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
15B2:					
Parke	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 16b.--Construction Materials--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of gravel		Potential as source of sand	
		Rating class	Value	Rating class	Value
109A:					
Racoon--------------	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
120A:					
Huey----------------	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
218A:					
Newberry------------	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
421G:					
Kell----------------	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
533:					
Urban land----------	90	Not rated		Not rated	
551D2:					
Gosport-------------	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
551F:					
Gosport-------------	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
551G:					
Gosport-------------	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
581A:					
Tamalco-------------	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
652C2:					
Passport------------	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
652D2:					
Passport------------	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
801B:					
Orthents------------	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
810:					
Oil-waste land------	80	Not rated		Not rated	

Table 16b.--Construction Materials--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of gravel: Rating class	Value	Potential as source of sand: Rating class	Value
888C2:					
Passport	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Grantfork	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
908D2:					
Hickory	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Kell	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
908F:					
Hickory	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Kell	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
912A:					
Hoyleton	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Darmstadt	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
912B:					
Hoyleton	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Darmstadt	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
912B2:					
Hoyleton	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Darmstadt	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
914C2:					
Atlas	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 16b.--Construction Materials--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of gravel: Rating class	Potential as source of gravel: Value	Potential as source of sand: Rating class	Potential as source of sand: Value
914C2:					
Grantfork	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
929D2:					
Ava	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Hickory	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
947D2:					
Hickory	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Passport	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
947D3:					
Hickory	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Passport	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
967F:					
Hickory	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Gosport	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
991A:					
Cisne	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Huey	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
1524A:					
Zipp	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
3072A:					
Sharon	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 16b.--Construction Materials--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of gravel: Rating class	Value	Potential as source of sand: Rating class	Value
3108A:					
Bonnie	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
3108T:					
Bonnie	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
3225A:					
Holton	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
3226A:					
Wirt	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
3333A:					
Wakeland	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
3334A:					
Birds	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
3382A:					
Belknap	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
3415A:					
Orion	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
7337B:					
Creal	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
8787A:					
Banlic	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 17a.--Water Management

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2A:							
Cisne---------------	90	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.04	Depth to saturated zone	1.00	Slow refill	0.28
				Ponding	1.00	Cutbanks cave	0.10
				Piping	0.28		
3A:							
Hoyleton------------	90	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.04	Depth to saturated zone	1.00	Slow refill	0.96
				Piping	0.16	Cutbanks cave	0.10
3B:							
Hoyleton------------	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Seepage	0.04	Depth to saturated zone	1.00	Slow refill	0.96
				Piping	0.01	Cutbanks cave	0.10
						Depth to saturated zone	0.01
3B2:							
Hoyleton------------	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Seepage	0.04	Depth to saturated zone	1.00	Slow refill	0.96
						Cutbanks cave	0.10
						Depth to saturated zone	0.01
4B:							
Richview------------	92	Somewhat limited		Somewhat limited		Somewhat limited	
		Seepage	0.72	Piping	0.76	Slow refill	0.28
				Depth to saturated zone	0.68	Depth to saturated zone	0.14
						Cutbanks cave	0.10
4C2:							
Richview------------	92	Very limited		Somewhat limited		Somewhat limited	
		Seepage	1.00	Depth to saturated zone	0.68	Depth to saturated zone	0.14
		Slope	1.00	Piping	0.64	Cutbanks cave	0.10
5C3:							
Blair---------------	90	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.68	Depth to saturated zone	1.00	Slow refill	0.96
		Seepage	0.04	Piping	0.01	Cutbanks cave	0.10
7C2:							
Atlas---------------	90	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.92	Depth to saturated zone	1.00	Slow refill	1.00
		Seepage	0.01	Piping	0.06	Cutbanks cave	0.10

Table 17a.--Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
7C3:							
Atlas---------------	90	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to saturated zone	1.00	Slow refill	1.00
						Cutbanks cave	0.10
7D2:							
Atlas---------------	90	Very limited		Very limited		Somewhat limited	
		Slope	1.00	Depth to saturated zone	1.00	Slow refill	1.00
		Seepage	0.01			Cutbanks cave	0.10
				Piping	0.01		
7D3:							
Atlas---------------	90	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to saturated zone	1.00	Slow refill	1.00
						Cutbanks cave	0.10
8D3:							
Hickory-------------	90	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.01	Depth to water	1.00
		Seepage	0.72				
8F:							
Hickory-------------	91	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.14	Depth to water	1.00
		Seepage	0.72				
8G:							
Hickory-------------	95	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.90	Depth to water	1.00
		Seepage	0.72				
10C:							
Plumfield-----------	90	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Depth to saturated zone	0.84	Depth to water	1.00
		Seepage	0.04				
				Piping	0.02		
12A:							
Wynoose-------------	90	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.04	Depth to saturated zone	1.00	Slow refill	0.28
						Cutbanks cave	0.10
				Ponding	1.00		
				Piping	0.09		
13A:							
Bluford-------------	90	Somewhat limited		Very limited		Very limited	
		Seepage	0.04	Depth to saturated zone	1.00	Depth to water	1.00
				Piping	0.01		
13B:							
Bluford-------------	90	Somewhat limited		Very limited		Very limited	
		Seepage	0.04	Depth to saturated zone	1.00	Depth to water	1.00
				Piping	0.01		
13B2:							
Bluford-------------	90	Somewhat limited		Very limited		Very limited	
		Seepage	0.02	Depth to saturated zone	1.00	Depth to water	1.00

Table 17a.--Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
14B:							
Ava	90	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Depth to saturated zone	0.95	Depth to water	1.00
				Piping	0.12		
14C2:							
Ava	90	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Depth to saturated zone	0.95	Depth to water	1.00
		Seepage	0.04				
				Piping	0.01		
15B2:							
Parke	90	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.52	Depth to water	1.00
109A:							
Racoon	90	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.04	Depth to saturated zone	1.00	Slow refill	0.96
						Cutbanks cave	0.10
				Ponding	1.00		
				Piping	0.50		
120A:							
Huey	90	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.02	Depth to saturated zone	1.00	Slow refill	0.28
						Cutbanks cave	0.10
				Piping	1.00		
				Ponding	1.00		
218A:							
Newberry	95	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.02	Depth to saturated zone	1.00	Slow refill	0.28
						Cutbanks cave	0.10
				Piping	1.00		
				Ponding	1.00		
421G:							
Kell	90	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.80	Depth to water	1.00
		Seepage	0.72	Thin layer	0.70		
		Depth to bedrock	0.04				
533:							
Urban land	90	Not rated		Not rated		Not rated	
551D2:							
Gosport	90	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Thin layer	0.74	Slow refill	1.00
		Depth to bedrock	0.05	Depth to saturated zone	0.46	Depth to saturated zone	0.24
				Piping	0.01	Cutbanks cave	0.10
551F:							
Gosport	90	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Thin layer	0.81	Slow refill	1.00
		Depth to bedrock	0.08	Depth to saturated zone	0.46	Depth to saturated zone	0.24
				Piping	0.08	Cutbanks cave	0.10

Table 17a.--Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
551G:							
Gosport	90	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Thin layer	0.74	Slow refill	1.00
		Depth to bedrock	0.05	Depth to saturated zone	0.46	Depth to saturated zone	0.24
				Piping	0.02	Cutbanks cave	0.10
581A:							
Tamalco	90	Somewhat limited		Very limited		Very limited	
		Seepage	0.02	Piping	1.00	Slow refill	1.00
				Depth to saturated zone	0.86	Cutbanks cave	0.10
						Depth to saturated zone	0.06
652C2:							
Passport	90	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.32	Depth to saturated zone	1.00	Slow refill	0.96
		Seepage	0.04	Piping	0.04	Cutbanks cave	0.10
652D2:							
Passport	90	Very limited		Very limited		Somewhat limited	
		Slope	1.00	Depth to saturated zone	1.00	Slow refill	0.96
		Seepage	0.04	Piping	0.04	Cutbanks cave	0.10
801B:							
Orthents	90	Somewhat limited		Not rated		Very limited	
		Seepage	0.54			Depth to water	1.00
		Slope	0.08				
810:							
Oil-waste land	80	Not rated		Not rated		Not rated	
888C2:							
Passport	50	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.32	Depth to saturated zone	1.00	Slow refill	0.96
		Seepage	0.04	Piping	0.04	Cutbanks cave	0.10
Grantfork	35	Very limited		Very limited		Somewhat limited	
		Slope	1.00	Depth to saturated zone	1.00	Slow refill	0.96
		Seepage	0.04	Piping	0.87	Cutbanks cave	0.10
908D2:							
Hickory	60	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.90	Depth to water	1.00
		Seepage	0.72				
Kell	30	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.79	Depth to water	1.00
		Seepage	0.72	Thin layer	0.56		
		Depth to bedrock	0.02				
908F:							
Hickory	55	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	1.00	Depth to water	1.00
		Seepage	0.72				

Table 17a.--Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
908F:							
Kell	35	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.80	Depth to water	1.00
		Seepage	0.72	Thin layer	0.70		
		Depth to bedrock	0.04				
912A:							
Hoyleton	50	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.04	Depth to saturated zone	1.00	Slow refill	0.96
						Cutbanks cave	0.10
				Piping	0.16		
Darmstadt	40	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.02	Depth to saturated zone	1.00	Slow refill	0.98
						Cutbanks cave	0.10
				Piping	1.00		
912B:							
Hoyleton	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Seepage	0.04	Depth to saturated zone	1.00	Slow refill	0.96
						Cutbanks cave	0.10
				Piping	0.01	Depth to saturated zone	0.01
Darmstadt	40	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.02	Depth to saturated zone	1.00	Slow refill	0.98
						Cutbanks cave	0.10
				Piping	1.00		
912B2:							
Hoyleton	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Seepage	0.04	Depth to saturated zone	1.00	Slow refill	0.96
						Cutbanks cave	0.10
						Depth to saturated zone	0.01
Darmstadt	40	Somewhat limited		Very limited		Very limited	
		Slope	0.08	Depth to saturated zone	1.00	Slow refill	1.00
						Cutbanks cave	0.10
				Piping	1.00		
914C2:							
Atlas	50	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.92	Depth to saturated zone	1.00	Slow refill	1.00
		Seepage	0.01			Cutbanks cave	0.10
				Piping	0.06		
Grantfork	40	Somewhat limited		Very limited		Very limited	
		Slope	0.92	Depth to saturated zone	1.00	Slow refill	1.00
						Cutbanks cave	0.10
				Piping	0.78		
929D2:							
Ava	55	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Depth to saturated zone	0.95	Depth to water	1.00
		Seepage	0.04				
Hickory	40	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.80	Depth to water	1.00
		Seepage	0.72				

Table 17a.--Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
947D2:							
Hickory-------------	45	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.80	Depth to water	1.00
		Seepage	0.72				
Passport------------	40	Very limited		Very limited		Somewhat limited	
		Slope	1.00	Depth to saturated zone	1.00	Slow refill	0.96
		Seepage	0.04	Piping	0.04	Cutbanks cave	0.10
947D3:							
Hickory-------------	45	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.67	Depth to water	1.00
		Seepage	0.72				
Passport------------	40	Very limited		Very limited		Somewhat limited	
		Slope	1.00	Depth to saturated zone	1.00	Slow refill	0.96
		Seepage	0.04	Piping	0.02	Cutbanks cave	0.10
967F:							
Hickory-------------	50	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.78	Depth to water	1.00
		Seepage	0.72				
Gosport-------------	35	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Thin layer	0.81	Slow refill	1.00
		Depth to bedrock	0.08	Depth to saturated zone	0.46	Depth to saturated zone	0.24
				Piping	0.08	Cutbanks cave	0.10
991A:							
Cisne---------------	50	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.04	Depth to saturated zone	1.00	Slow refill	0.28
				Ponding	1.00	Cutbanks cave	0.10
				Piping	0.28		
Huey----------------	40	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.02	Depth to saturated zone	1.00	Slow refill	0.28
				Piping	1.00	Cutbanks cave	0.10
				Ponding	1.00		
1524A:							
Zipp----------------	90	Not limited		Very limited		Somewhat limited	
				Depth to saturated zone	1.00	Slow refill	0.96
				Ponding	1.00	Cutbanks cave	0.10
				Hard to pack	0.84		
3072A:							
Sharon--------------	90	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.72	Piping	1.00	Slow refill	0.28
				Depth to saturated zone	0.62	Depth to saturated zone	0.17
						Cutbanks cave	0.10

Table 17a.--Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
3108A:							
Bonnie	90	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.04	Ponding	1.00	Slow refill	0.28
				Depth to saturated zone	1.00	Cutbanks cave	0.10
				Piping	1.00		
3108T:							
Bonnie	90	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.04	Depth to saturated zone	1.00	Slow refill	0.28
						Cutbanks cave	0.10
				Piping	1.00		
				Ponding	1.00		
3225A:							
Holton	90	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	0.10
				Piping	1.00		
3226A:							
Wirt	90	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	Depth to water	1.00
3333A:							
Wakeland	90	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.72	Depth to saturated zone	1.00	Slow refill	0.28
						Cutbanks cave	0.10
				Piping	1.00		
3334A:							
Birds	90	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.04	Depth to saturated zone	1.00	Slow refill	0.96
						Cutbanks cave	0.10
				Piping	1.00		
				Ponding	1.00		
3382A:							
Belknap	90	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.73	Depth to saturated zone	1.00	Cutbanks cave	0.50
						Slow refill	0.27
				Piping	0.97		
3415A:							
Orion	90	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.72	Depth to saturated zone	1.00	Slow refill	0.28
						Cutbanks cave	0.10
				Piping	1.00		
7337B:							
Creal	90	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.04	Depth to saturated zone	1.00	Slow refill	0.96
						Cutbanks cave	0.10
				Piping	0.10		

Table 17a.--Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
8787A:							
Banlic--------------	90	Somewhat limited		Very limited		Very limited	
		Seepage	0.04	Depth to saturated zone	1.00	Depth to water	1.00
				Piping	1.00		

Table 17b.--Water Management

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Constructing grassed waterways and surface drains		Constructing terraces and diversions		Tile drains and underground outlets	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2A:							
Cisne---------------	90	Not limited		Very limited		Very limited	
				Water erosion	1.00	Restricted permeability	0.98
				Depth to saturated zone	1.00	Ponding	0.33
				Ponding	1.00	Frost action	0.10
				Restricted permeability	0.93		
3A:							
Hoyleton------------	90	Not limited		Very limited		Somewhat limited	
				Water erosion	1.00	Restricted permeability	0.43
				Depth to saturated zone	1.00	Frost action	0.10
				Restricted permeability	0.40	Deep to water	0.05
3B:							
Hoyleton------------	90	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.16	Water erosion	1.00	Restricted permeability	0.43
				Depth to saturated zone	1.00	Deep to water	0.11
				Restricted permeability	0.40	Frost action	0.10
3B2:							
Hoyleton------------	90	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.16	Water erosion	1.00	Restricted permeability	0.43
				Depth to saturated zone	1.00	Deep to water	0.11
				Restricted permeability	0.40	Frost action	0.10
4B:							
Richview------------	92	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.04	Water erosion	1.00	Deep to water	0.37
				Depth to saturated zone	1.00	Frost action	0.10
4C2:							
Richview------------	92	Somewhat limited		Very limited		Somewhat limited	
		Slope	1.00	Water erosion	1.00	Slope	0.84
				Depth to saturated zone	1.00	Deep to water	0.37
						Frost action	0.10
5C3:							
Blair---------------	90	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.83	Depth to saturated zone	1.00	Slope	0.37
				Restricted permeability	0.22	Restricted permeability	0.21
						Frost action	0.10

Table 17b.--Water Management--Continued

Map symbol and soil name	Pct. of map unit	Constructing grassed waterways and surface drains: Rating class and limiting features	Value	Constructing terraces and diversions: Rating class and limiting features	Value	Tile drains and underground outlets: Rating class and limiting features	Value
7C2:							
Atlas	90	Somewhat limited		Very limited		Very limited	
		Slope	0.95	Water erosion	1.00	Restricted permeability	0.96
				Depth to saturated zone	1.00	Slope	0.63
				Restricted permeability	0.91		
7C3:							
Atlas	90	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to saturated zone	1.00	Restricted permeability	0.98
				Slope	1.00	Slope	0.96
				Restricted permeability	0.93	Frost action	0.10
7D2:							
Atlas	90	Very limited		Very limited		Very limited	
		Slope	1.00	Water erosion	1.00	Slope	1.00
				Slope	1.00	Restricted permeability	0.96
				Depth to saturated zone	1.00		
				Restricted permeability	0.91		
7D3:							
Atlas	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to saturated zone	1.00	Restricted permeability	0.98
				Restricted permeability	0.93	Frost action	0.10
8D3:							
Hickory	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Very deep to water	1.00
8F:							
Hickory	91	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Very deep to water	1.00
8G:							
Hickory	95	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Very deep to water	1.00
10C:							
Plumfield	90	Very limited		Very limited		Very limited	
		Thick cemented pan	1.00	Water erosion	1.00	Depth to fragipan	1.00
		Slope	1.00	Depth to saturated zone	1.00	Slope	0.84
				Restricted permeability	0.22	Deep to water	0.26
						Restricted permeability	0.21
						Frost action	0.10

Table 17b.--Water Management--Continued

Map symbol and soil name	Pct. of map unit	Constructing grassed waterways and surface drains: Rating class and limiting features	Value	Constructing terraces and diversions: Rating class and limiting features	Value	Tile drains and underground outlets: Rating class and limiting features	Value
12A:							
Wynoose-------------	90	Not limited		Very limited		Very limited	
				Water erosion	1.00	Restricted permeability	0.98
				Depth to saturated zone	1.00	Ponding	0.33
				Ponding	1.00	Frost action	0.10
				Restricted permeability	0.93		
13A:							
Bluford-------------	90	Very limited		Very limited		Somewhat limited	
		Thick cemented pan	1.00	Water erosion	1.00	Restricted permeability	0.43
		Thin cemented pan	0.10	Depth to saturated zone	1.00	Depth to fragipan	0.17
				Restricted permeability	0.40	Frost action	0.10
						Deep to water	0.01
13B:							
Bluford-------------	90	Very limited		Very limited		Somewhat limited	
		Thick cemented pan	1.00	Water erosion	1.00	Restricted permeability	0.21
		Slope	0.16	Depth to saturated zone	1.00	Depth to fragipan	0.17
		Thin cemented pan	0.10	Restricted permeability	0.22	Frost action	0.10
						Deep to water	0.01
13B2:							
Bluford-------------	90	Very limited		Very limited		Somewhat limited	
		Thick cemented pan	1.00	Water erosion	1.00	Restricted permeability	0.43
		Slope	0.16	Depth to saturated zone	1.00	Frost action	0.10
		Thin cemented pan	0.03	Restricted permeability	0.40	Depth to fragipan	0.08
						Deep to water	0.04
14B:							
Ava-----------------	90	Very limited		Very limited		Somewhat limited	
		Thick cemented pan	1.00	Water erosion	1.00	Depth to fragipan	0.24
		Slope	0.16	Rooting depth	1.00	Restricted permeability	0.21
		Thin cemented pan	0.16	Depth to saturated zone	1.00	Deep to water	0.17
				Restricted permeability	0.22	Frost action	0.10
14C2:							
Ava-----------------	90	Very limited		Very limited		Somewhat limited	
		Thick cemented pan	1.00	Water erosion	1.00	Slope	0.84
		Slope	1.00	Rooting depth	1.00	Depth to fragipan	0.45
		Thin cemented pan	0.35	Depth to saturated zone	1.00	Restricted permeability	0.21
				Restricted permeability	0.22	Deep to water	0.17
						Frost action	0.10
15B2:							
Parke---------------	90	Somewhat limited		Very limited		Very limited	
		Slope	0.16	Water erosion	1.00	Very deep to water	1.00
						Frost action	0.10

Table 17b.--Water Management--Continued

Map symbol and soil name	Pct. of map unit	Constructing grassed waterways and surface drains: Rating class and limiting features	Value	Constructing terraces and diversions: Rating class and limiting features	Value	Tile drains and underground outlets: Rating class and limiting features	Value
109A:							
Racoon	90	Not limited		Very limited		Very limited	
				Water erosion	1.00	Restricted permeability	0.96
				Depth to saturated zone	1.00	Ponding	0.33
				Ponding	1.00	Frost action	0.10
				Restricted permeability	0.91		
120A:							
Huey	90	Not limited		Very limited		Very limited	
				Water erosion	1.00	Excess sodium	1.00
				Depth to saturated zone	1.00	Restricted permeability	1.00
				Ponding	1.00	Ponding	0.33
				Restricted permeability	0.99	Frost action	0.10
218A:							
Newberry	95	Not limited		Very limited		Somewhat limited	
				Water erosion	1.00	Restricted permeability	0.43
				Depth to saturated zone	1.00	Ponding	0.33
				Ponding	1.00	Frost action	0.10
				Restricted permeability	0.40	Excess sodium	0.10
421G:							
Kell	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Cobbles	1.00	Content of large stones	0.80	Content of large stones	1.00
		Soft bedrock	0.10	Depth to soft bedrock	0.10	Very deep to water	1.00
						Depth to dense layer	0.10
						Depth to bedrock	0.02
533:							
Urban land	90	Not rated		Not rated		Not rated	
551D2:							
Gosport	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Cobbles	0.88	Restricted permeability	0.91	Content of large stones	1.00
		Soft bedrock	0.16	Depth to soft bedrock	0.15	Restricted permeability	0.96
						Deep to water	0.52
						Depth to bedrock	0.04
551F:							
Gosport	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Cobbles	1.00	Restricted permeability	0.91	Content of large stones	1.00
		Soft bedrock	0.29	Depth to soft bedrock	0.29	Restricted permeability	0.96
						Deep to water	0.52
						Depth to bedrock	0.07

Table 17b.--Water Management--Continued

Map symbol and soil name	Pct. of map unit	Constructing grassed waterways and surface drains: Rating class and limiting features	Value	Constructing terraces and diversions: Rating class and limiting features	Value	Tile drains and underground outlets: Rating class and limiting features	Value
551G:							
Gosport	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Cobbles	0.88	Restricted permeability	0.91	Content of large stones	1.00
		Soft bedrock	0.16	Depth to soft bedrock	0.15	Restricted permeability	0.96
						Deep to water	0.52
						Depth to bedrock	0.04
581A:							
Tamalco	90	Not limited		Very limited		Very limited	
				Water erosion	1.00	Excess sodium	1.00
				Depth to saturated zone	1.00	Restricted permeability	1.00
				Restricted permeability	0.99	Deep to water	0.25
						Frost action	0.10
652C2:							
Passport	90	Somewhat limited		Very limited		Very limited	
		Slope	0.62	Water erosion	1.00	Restricted permeability	0.96
				Depth to saturated zone	1.00	Slope	0.16
				Restricted permeability	0.91	Deep to water	0.03
652D2:							
Passport	90	Very limited		Very limited		Very limited	
		Slope	1.00	Water erosion	1.00	Slope	1.00
				Slope	1.00	Restricted permeability	0.96
				Depth to saturated zone	1.00	Deep to water	0.03
				Restricted permeability	0.91		
801B:							
Orthents	90	Somewhat limited		Very limited		Very limited	
		Slope	0.36	Water erosion	1.00	Very deep to water	1.00
						Frost action	0.10
						Slope	0.04
810:							
Oil-waste land	80	Not rated		Not rated		Not rated	
888C2:							
Passport	50	Somewhat limited		Very limited		Very limited	
		Slope	0.62	Water erosion	1.00	Restricted permeability	0.96
				Depth to saturated zone	1.00	Slope	0.16
				Restricted permeability	0.91	Deep to water	0.03
Grantfork	35	Very limited		Very limited		Very limited	
		Slope	1.00	Water erosion	1.00	Slope	0.96
				Depth to saturated zone	1.00	Restricted permeability	0.96
				Slope	1.00	Excess sodium	0.22
				Restricted permeability	0.91	Frost action	0.10
						Deep to water	0.03

Table 17b.--Water Management--Continued

Map symbol and soil name	Pct. of map unit	Constructing grassed waterways and surface drains: Rating class and limiting features	Value	Constructing terraces and diversions: Rating class and limiting features	Value	Tile drains and underground outlets: Rating class and limiting features	Value
908D2:							
Hickory-------------	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Very deep to water	1.00
Kell----------------	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Soft bedrock	0.01	Depth to soft bedrock	0.01	Content of large stones	1.00
						Very deep to water	1.00
						Depth to dense layer	0.01
						Depth to bedrock	0.01
908F:							
Hickory-------------	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Very deep to water	1.00
Kell----------------	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Cobbles	1.00	Content of large stones	0.80	Content of large stones	1.00
		Soft bedrock	0.10	Depth to soft bedrock	0.10	Very deep to water	1.00
						Depth to dense layer	0.10
						Depth to bedrock	0.02
912A:							
Hoyleton------------	50	Not limited		Very limited		Somewhat limited	
				Water erosion	1.00	Restricted permeability	0.43
				Depth to saturated zone	1.00	Frost action	0.10
				Restricted permeability	0.40	Deep to water	0.05
Darmstadt-----------	40	Not limited		Very limited		Very limited	
				Water erosion	1.00	Excess sodium	1.00
				Depth to saturated zone	1.00	Restricted permeability	1.00
				Restricted permeability	0.99	Frost action	0.10
						Deep to water	0.02
912B:							
Hoyleton------------	50	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.16	Water erosion	1.00	Restricted permeability	0.43
				Depth to saturated zone	1.00	Deep to water	0.11
				Restricted permeability	0.40	Frost action	0.10

Table 17b.--Water Management--Continued

Map symbol and soil name	Pct. of map unit	Constructing grassed waterways and surface drains: Rating class and limiting features	Value	Constructing terraces and diversions: Rating class and limiting features	Value	Tile drains and underground outlets: Rating class and limiting features	Value
912B:							
Darmstadt-----------	40	Somewhat limited		Very limited		Very limited	
		Slope	0.16	Water erosion	1.00	Restricted permeability	1.00
				Depth to saturated zone	1.00	Excess sodium	0.90
				Restricted permeability	0.99	Frost action	0.10
						Deep to water	0.02
912B2:							
Hoyleton------------	50	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.16	Water erosion	1.00	Restricted permeability	0.43
				Depth to saturated zone	1.00	Deep to water	0.11
				Restricted permeability	0.40	Frost action	0.10
Darmstadt-----------	40	Somewhat limited		Very limited		Very limited	
		Slope	0.36	Water erosion	1.00	Restricted permeability	1.00
				Depth to saturated zone	1.00	Excess sodium	1.00
				Restricted permeability	0.99	Frost action	0.10
						Slope	0.04
						Deep to water	0.02
914C2:							
Atlas---------------	50	Somewhat limited		Very limited		Very limited	
		Slope	0.95	Water erosion	1.00	Restricted permeability	0.96
				Depth to saturated zone	1.00	Slope	0.63
				Restricted permeability	0.91	Frost action	0.10
Grantfork-----------	40	Somewhat limited		Very limited		Very limited	
		Slope	0.95	Water erosion	1.00	Restricted permeability	0.96
				Depth to saturated zone	1.00	Slope	0.63
				Restricted permeability	0.91	Excess sodium	0.22
929D2:							
Ava-----------------	55	Very limited		Very limited		Very limited	
		Slope	1.00	Water erosion	1.00	Slope	1.00
		Thick cemented pan	1.00	Slope	1.00	Depth to fragipan	0.87
		Thin cemented pan	0.84	Depth to saturated zone	1.00	Restricted permeability	0.21
				Rooting depth	1.00	Deep to water	0.17
				Restricted permeability	0.22	Frost action	0.10
Hickory-------------	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Very deep to water	1.00
947D2:							
Hickory-------------	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Very deep to water	1.00

Table 17b.--Water Management--Continued

Map symbol and soil name	Pct. of map unit	Constructing grassed waterways and surface drains: Rating class and limiting features	Value	Constructing terraces and diversions: Rating class and limiting features	Value	Tile drains and underground outlets: Rating class and limiting features	Value
947D2:							
Passport------------	40	Very limited		Very limited		Very limited	
		Slope	1.00	Water erosion	1.00	Slope	1.00
				Slope	1.00	Restricted permeability	0.96
				Depth to saturated zone	1.00	Deep to water	0.03
				Restricted permeability	0.91		
947D3:							
Hickory-------------	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Very deep to water	1.00
Passport------------	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to saturated zone	1.00	Restricted permeability	0.96
				Restricted permeability	0.91	Deep to water	0.03
967F:							
Hickory-------------	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Very deep to water	1.00
Gosport-------------	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Cobbles	1.00	Restricted permeability	0.91	Content of large stones	1.00
		Soft bedrock	0.29	Depth to soft bedrock	0.29	Restricted permeability	0.96
						Deep to water	0.52
						Depth to bedrock	0.07
991A:							
Cisne---------------	50	Not limited		Very limited		Very limited	
				Water erosion	1.00	Restricted permeability	0.98
				Depth to saturated zone	1.00	Ponding	0.33
				Ponding	1.00	Frost action	0.10
				Restricted permeability	0.93		
Huey----------------	40	Not limited		Very limited		Very limited	
				Water erosion	1.00	Excess sodium	1.00
				Depth to saturated zone	1.00	Restricted permeability	1.00
				Ponding	1.00	Ponding	0.33
				Restricted permeability	0.99	Frost action	0.10

Table 17b.--Water Management--Continued

Map symbol and soil name	Pct. of map unit	Constructing grassed waterways and surface drains: Rating class and limiting features	Value	Constructing terraces and diversions: Rating class and limiting features	Value	Tile drains and underground outlets: Rating class and limiting features	Value
1524A:							
Zipp	90	Not limited		Very limited Depth to saturated zone Ponding Restricted permeability	 1.00 1.00 0.91	Very limited Restricted permeability Ponding Flooding Frost action	 0.96 0.62 0.35 0.10
3072A:							
Sharon	90	Not limited		Very limited Water erosion Depth to saturated zone	 1.00 1.00	Somewhat limited Deep to water Flooding Frost action	 0.41 0.35 0.10
3108A:							
Bonnie	90	Not limited		Very limited Water erosion Depth to saturated zone Ponding Restricted permeability	 1.00 1.00 1.00 0.22	Somewhat limited Ponding Flooding Restricted permeability Frost action	 0.47 0.35 0.21 0.10
3108T:							
Bonnie	90	Not limited		Very limited Water erosion Depth to saturated zone Ponding Restricted permeability	 1.00 1.00 1.00 0.91	Very limited Restricted permeability Excess sodium Flooding Ponding Frost action	 0.96 0.60 0.35 0.33 0.10
3225A:							
Holton	90	Not limited		Very limited Water erosion Depth to saturated zone	 1.00 1.00	Somewhat limited Flooding Frost action Deep to water	 0.35 0.10 0.01
3226A:							
Wirt	90	Not limited		Very limited Water erosion	 1.00	Very limited Very deep to water Flooding	 1.00 0.35
3333A:							
Wakeland	90	Not limited		Very limited Water erosion Depth to saturated zone	 1.00 1.00	Somewhat limited Flooding Frost action	 0.35 0.10
3334A:							
Birds	90	Not limited		Very limited Water erosion Depth to saturated zone Ponding Restricted permeability	 1.00 1.00 1.00 0.22	Somewhat limited Flooding Ponding Restricted permeability Frost action	 0.35 0.33 0.21 0.10

Table 17b.--Water Management--Continued

Map symbol and soil name	Pct. of map unit	Constructing grassed waterways and surface drains		Constructing terraces and diversions		Tile drains and underground outlets	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3382A:							
Belknap	90	Not limited		Very limited		Somewhat limited	
				Water erosion	1.00	Flooding	0.35
				Depth to saturated zone	1.00	Frost action	0.10
						Deep to water	0.01
3415A:							
Orion	90	Not limited		Very limited		Somewhat limited	
				Water erosion	1.00	Flooding	0.35
				Depth to saturated zone	1.00	Frost action	0.10
						Deep to water	0.04
7337B:							
Creal	90	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.04	Water erosion	1.00	Restricted permeability	0.21
				Depth to saturated zone	1.00	Frost action	0.10
				Restricted permeability	0.22	Flooding	0.05
						Deep to water	0.03
8787A:							
Banlic	90	Not limited		Very limited		Somewhat limited	
				Water erosion	1.00	Depth to fragipan	0.55
				Depth to saturated zone	1.00	Restricted permeability	0.21
				Restricted permeability	0.22	Flooding	0.10
						Frost action	0.10
						Deep to water	0.01

Table 18.--Engineering Index Properties

(Absence of an entry indicates that 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	
2A:												
Cisne-----------	0-8	Silt loam	CL, CL-ML, ML	A-6, A-4	0	0	100	100	95-100	90-100	23-38	6-13
	8-17	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	90-100	21-32	6-13
	17-37	Silty clay loam, silty clay	CH, CL	A-7-6	0	0	100	100	95-100	90-100	46-56	25-33
	37-60	Silty clay loam, silt loam, clay loam, loam	CL	A-6, A-7-6	0	0	95-100	84-100	75-99	60-90	31-46	13-25
	60-80	Silt loam, loam, clay loam, silty clay loam	CL	A-7-6, A-6	0	0	95-100	82-97	75-97	55-90	29-44	13-25
3A:												
Hoyleton--------	0-8	Silt loam	CL	A-4, A-6, A-7-6	0	0	100	100	95-100	85-100	25-44	7-18
	8-11	Silt loam	CL	A-6	0	0	100	100	95-100	85-100	28-38	12-19
	11-39	Silty clay loam, silty clay	CH, CL	A-7-6	0	0	100	100	95-100	90-100	46-56	25-33
	39-80	Silt loam, silty clay loam, clay loam, loam	CL	A-6, A-7-6	0	0	100	95-100	80-100	60-97	28-46	12-25
3B:												
Hoyleton--------	0-8	Silt loam	CL, ML	A-4, A-6, A-7-6	0	0	100	100	95-100	85-100	25-44	7-18
	8-15	Silt loam	CL	A-6	0	0	100	100	95-100	85-100	28-38	12-19
	15-34	Silty clay loam, silty clay	CH, CL	A-7-6	0	0	100	100	95-100	90-100	46-56	25-33
	34-60	Silt loam, silty clay loam, clay loam, loam	CL	A-6, A-7-6	0	0	100	95-100	80-100	60-97	28-46	12-25

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	
3B2:												
Hoyleton--------	0-7	Silt loam	CL, ML	A-4, A-6, A-7-6	0	0	100	100	95-100	85-100	24-42	7-18
	7-30	Silty clay loam, silty clay	CH, CL	A-7-6	0	0	100	100	95-100	90-100	46-56	25-33
	30-60	Silt loam, silty clay loam, clay loam, loam	CL	A-6, A-7-6	0	0	100	95-100	80-100	60-97	28-46	12-25
4B:												
Richview--------	0-8	Silt loam	CL-ML, CL	A-4	0	0	100	100	95-100	90-99	24-31	6-11
	8-12	Silt loam	ML, CL	A-6, A-4	0	0	100	100	95-100	90-99	24-35	7-15
	12-38	Silty clay loam, silt loam	CL	A-7-6, A-6	0	0	100	100	95-100	90-100	35-46	15-25
	38-46	Silt loam, loam, clay loam	ML, CL	A-6, A-4	0	0	87-98	78-98	70-98	50-90	27-40	9-21
	46-60	Sandy loam, loam, silt loam	SM, CL-ML, ML, CL, SC-SM	A-6, A-4, A-2-6, A-2-4	0	0	87-98	78-98	60-98	30-85	13-29	NP-12
4C2:												
Richview--------	0-7	Silt loam	CL-ML, CL	A-4	0	0	100	100	95-100	90-99	24-31	6-11
	7-12	Silt loam	ML, CL	A-6, A-4	0	0	100	100	95-100	90-99	24-35	7-15
	12-40	Silty clay loam, silt loam	CL	A-7-6, A-6	0	0	100	100	95-100	90-100	35-46	15-25
	40-60	Silt loam, loam, clay loam	ML, CL	A-6, A-4	0	0	87-98	78-98	70-98	50-90	27-40	9-21
	60-80	Sandy loam, loam, silt loam	SC-SM, SM, CL-ML, ML, CL	A-6, A-4, A-2-6, A-2-4	0	0	87-98	78-98	60-98	30-85	13-29	NP-12
5C3:												
Blair-----------	0-4	Silty clay loam	CL	A-6, A-7-6	0	0	100	90-100	85-100	75-95	37-43	19-21
	4-20	Silty clay loam	CL	A-6, A-7-6	0	0	100	97-100	90-100	85-100	37-46	19-25
	20-60	Clay loam, silt loam, silty clay loam, loam	CL, ML	A-6, A-7-6	0	0	95-100	80-100	70-99	55-90	31-46	13-25

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	Plas- ticity index
	In				Pct	Pct					Pct	
7C2:												
Atlas-----------	0-4	Silt loam	CL, ML	A-4, A-6	0	0	100	91-100	85-100	65-98	24-37	7-18
	4-34	Clay loam, silty clay loam, silty clay, clay	CL	A-7-6	0	0	95-100	90-100	80-98	60-90	42-50	20-28
	34-68	Clay loam, loam	CL, ML	A-6	0	0	95-100	80-100	75-98	50-85	30-40	10-20
7C3:												
Atlas-----------	0-2	Silty clay loam	CL	A-6	0	0	100	91-100	85-100	75-95	37-40	16-20
	2-24	Clay loam, silty clay loam, silty clay, clay	CL	A-7-6	0	0	95-100	90-100	80-98	60-90	42-50	20-28
	24-68	Clay loam, silty clay loam, silty clay, clay	CL	A-7-6	0	0	95-100	90-100	80-98	60-90	42-50	20-28
7D2:												
Atlas-----------	0-6	Silt loam	CL, ML	A-4, A-6	0	0	100	91-100	85-100	65-98	24-37	7-18
	6-50	Clay loam, silty clay loam, silty clay, clay	CL	A-7-6	0	0	95-100	90-100	80-98	60-90	42-50	20-28
	50-65	Clay loam, loam	CL, ML	A-6	0	0	95-100	80-100	75-98	50-85	30-40	10-20
7D3:												
Atlas-----------	0-5	Silty clay loam	CL	A-6	0	0	100	91-100	85-100	75-95	37-40	16-20
	5-37	Clay loam, silty clay loam, silty clay, clay	CL	A-7-6	0	0	95-100	90-100	80-98	60-90	42-50	20-28
	37-60	Clay loam, silty clay loam, silty clay, clay	CL	A-7-6	0	0	95-100	90-100	80-98	60-90	42-50	20-28
8D3:												
Hickory---------	0-8	Clay loam	CL	A-6, A-7-6	0	0	98-100	92-100	81-96	65-79	35-45	15-25
	8-46	Clay loam, loam	CL	A-6, A-7-6	0	0-1	94-100	71-100	61-96	48-79	35-45	15-25
	46-58	Clay loam, loam	CL	A-4, A-6	0	0-1	94-100	72-100	54-92	38-70	25-40	10-20
	58-80	Loam, clay loam	CL, SC	A-2-4, A-6	0	0-1	94-100	72-100	59-97	43-75	25-40	10-20

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	
8F:												
Hickory---------	0-4	Silt loam	CL, ML	A-6, A-4	0	0-5	95-100	91-100	85-100	65-95	24-41	7-17
	4-12	Silt loam, loam	CL	A-6, A-4	0	0-5	95-100	91-100	80-100	50-90	25-33	9-15
	12-46	Clay loam, loam, silty clay loam, gravelly clay loam	CL, SC	A-6, A-7-6	0-1	0-5	85-100	70-100	60-100	40-90	34-46	16-25
	46-58	Loam, clay loam, gravelly clay loam	CL, SC	A-6, A-4, A-7-6	0-1	0-5	85-100	70-100	55-100	36-85	25-42	9-22
	58-80	Loam, sandy loam, gravelly clay loam	CL, SC	A-6, A-2-4, A-2-6, A-4	0-1	0-5	85-100	70-97	55-97	30-80	25-40	9-21
8G:												
Hickory---------	0-5	Loam	SC-SM, CL-ML, SM	A-4	0	0	100	85-100	65-100	45-80	15-25	4-7
	5-8	Loam	SC-SM, CL-ML, SM	A-4	0	0	100	85-100	65-100	45-80	15-25	4-7
	8-52	Clay loam, loam	CL, SC, ML	A-6	0	0-1	90-100	75-98	60-95	40-80	32-39	11-18
	52-60	Loam	SC-SM, CL-ML, CL, SC, ML	A-6, A-4	0	0-1	90-100	75-95	65-95	40-75	22-33	4-13
10C:												
Plumfield-------	0-5	Silty clay loam	CL	A-6, A-7-6	0	0	100	95-100	90-100	85-99	37-47	19-25
	5-12	Silt loam, silty clay loam	CL	A-6	0	0	100	95-100	90-100	80-97	29-40	13-21
	12-36	Silt loam, silty clay loam	CL	A-6	0	0	100	95-100	90-100	70-95	29-40	13-21
	36-70	Silt loam, silty clay loam, loam, clay loam	CL	A-7-6, A-6	0	0	100	84-98	75-98	55-90	29-44	13-25

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	
12A:												
Wynoose---------	0-7	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	85-100	22-36	6-13
	7-20	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	85-100	21-32	6-13
	20-36	Silty clay, silty clay loam	CH, CL	A-7-6	0	0	100	100	95-100	90-100	46-54	25-31
	36-66	Silty clay loam, clay loam, silt loam	CL	A-6, A-7-6	0	0	98-100	92-100	80-100	65-90	35-46	17-25
	66-80	Silty clay loam, clay loam, silt loam	CL	A-6, A-7-6	0	0	98-100	87-100	75-100	60-90	35-46	17-25
13A:												
Bluford---------	0-7	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	90-98	22-34	6-12
	7-20	Silt loam	CL	A-4, A-6	0	0	100	100	95-100	90-98	25-36	9-17
	20-35	Silty clay, silty clay loam	CL, CH	A-7-6	0	0	100	100	95-100	90-100	46-56	25-33
	35-60	Silty clay loam, silt loam, loam	CL	A-7-6, A-6	0	0	100	98-100	90-100	70-90	31-46	13-25
13B:												
Bluford---------	0-7	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	90-98	22-34	6-12
	7-20	Silt loam	CL	A-4, A-6	0	0	100	100	95-100	90-98	25-38	9-17
	20-35	Silty clay, silty clay loam	CL, CH	A-7-6	0	0	100	100	95-100	90-100	46-56	25-33
	35-60	Silty clay loam, silt loam, loam	CL	A-7-6, A-6	0	0	100	98-100	90-100	70-90	31-46	13-25
13B2:												
Bluford---------	0-9	Silt loam	CL	A-4, A-6	0	0	100	100	95-100	90-99	26-36	9-15
	9-37	Silty clay loam, silty clay	CH, CL	A-7-6	0	0	100	100	95-100	90-100	46-54	25-31
	37-60	Silty clay loam, loam, clay loam, silt loam	CL	A-6	0	0	100	95-100	85-100	65-90	31-41	13-21

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	
14B:												
Ava-------------	0-6	Silt loam	CL, ML	A-4, A-6	0	0	100	100	95-100	90-99	24-36	7-13
	6-14	Silt loam	CL	A-4, A-6	0	0	100	100	95-100	90-99	23-32	7-13
	14-34	Silty clay loam, silt loam	CL	A-6, A-7-6	0	0	100	100	95-100	90-100	35-46	17-25
	34-50	Silty clay loam, loam, silt loam, clay loam	CL	A-6	0	0	100	93-100	85-100	65-90	31-41	13-21
	50-60	Loam, silty clay loam, clay loam, silt loam	CL	A-6	0	0	100	97-100	90-100	70-90	29-40	13-21
14C2:												
Ava-------------	0-7	Silt loam	CL	A-4, A-6	0	0	100	100	95-100	90-99	26-36	9-15
	7-31	Silty clay loam, silt loam	CL	A-6, A-7-6	0	0	100	100	95-100	90-100	35-47	17-25
	31-50	Silty clay loam, silt loam, loam, clay loam	CL	A-7-6, A-6	0	0	100	93-100	85-100	65-90	31-42	13-21
	50-60	Silty clay loam, loam, clay loam, silt loam	CL	A-6	0	0	100	97-100	90-100	75-90	29-40	13-21
15B2:												
Parke-----------	0-7	Silt loam	CL, ML	A-4, A-7-6	0	0	100	100	95-100	85-97	23-41	7-19
	7-19	Silt loam, silty clay loam	ML, CL	A-7-6, A-4, A-6	0	0	100	100	95-100	90-97	29-42	9-21
	19-38	Silt loam, loam	CL	A-6	0	0	100	100	90-98	65-85	27-39	12-19
	38-68	Fine sandy loam, sandy loam, loam, sandy clay loam	SC-SM, SM, SC	A-2-5, A-2-6, A-2-7, A-4, A-7-6, A-2-4, A-6	0	0	92-100	83-100	65-90	25-50	22-42	6-21
109A:												
Racoon----------	0-6	Silt loam	ML, CL-ML, CL	A-6, A-4	0	0	100	96-100	90-100	85-100	23-35	5-14
	6-30	Silt loam	ML, CL	A-6, A-4	0	0	100	96-100	90-100	85-100	24-35	7-16
	30-59	Silty clay loam	CL	A-7-6, A-6	0	0	100	96-100	90-100	85-100	37-46	16-25
	59-73	Silt loam, loam	CL	A-6, A-4	0	0	100	97-100	85-100	65-95	27-37	9-18

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	
120A:												
Huey------------	0-8	Silt loam	CL, CL-ML, ML	A-6, A-4	0	0	100	100	95-100	90-100	22-36	6-13
	8-10	Silt, silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	90-100	21-32	6-13
	10-15	Silty clay loam, silt loam	CL	A-7-6, A-6	0	0	100	100	95-100	90-100	35-46	17-25
	15-49	Silty clay loam, silt loam	CL	A-6, A-7-6	0	0	100	100	95-100	90-100	35-46	17-25
	49-65	Silt loam, loam, silty clay loam	CL	A-7-6, A-6	0	0	95-100	82-97	75-97	55-90	29-44	13-25
218A:												
Newberry--------	0-9	Silt loam	CL-ML, CL, ML	A-4	0	0	100	100	95-100	90-100	21-29	3-9
	9-16	Silt loam	CL-ML, CL	A-4	0	0	100	100	95-100	90-100	21-29	4-11
	16-35	Silty clay loam, silt loam	CL	A-7-6, A-6	0	0	100	100	95-100	90-100	37-46	16-25
	35-48	Silty clay loam, clay loam, silt loam, loam	CL, ML	A-6, A-7-6	0	0	96-100	91-100	80-100	70-95	33-46	14-25
	48-80	Clay loam, silty clay loam	CL, CH	A-7-6	0	0	95-100	84-100	75-100	65-95	45-52	23-29
421G:												
Kell------------	0-3	Silt loam	CL, CL-ML	A-4	0	0	90-100	85-100	80-100	60-90	21-27	4-9
	3-13	Silt loam, loam	CL	A-6, A-4	0	0	85-100	75-100	65-100	50-90	27-33	8-13
	13-25	Silty clay loam, clay loam	CL	A-6	0	0-5	85-95	75-95	60-95	50-85	33-38	12-18
	25-35	Very parachannery silty clay loam, very parachannery clay loam	GC, GM	A-6	0-15	25-40	80-90	70-90	55-90	50-85	33-38	10-16
	35-60	Extremely paraflaggy silty clay loam, extremely paraflaggy clay loam	GC, GC-GM, GM	A-6	40-65	30-45	85-95	80-95	65-95	55-85	33-38	10-16

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	
533. Urban land												
551D2:												
Gosport---------	0-3	Silt loam	CL	A-6, A-4	0	0	85-100	75-100	65-100	55-90	27-33	8-13
	3-34	Silty clay, silty clay loam	CL	A-7-6	0	0	88-100	61-100	60-100	55-100	40-46	17-23
	34-60	Extremely paraflaggy silty clay	GC	A-1	40-65	30-45	80-92	65-92	65-90	55-90	41-51	16-25
551F:												
Gosport---------	0-4	Silt loam	CL	A-6, A-4	0	0	85-100	75-100	65-100	55-90	27-33	8-13
	4-7	Silt loam	CL	A-6, A-4	0	0	85-100	75-100	65-100	55-90	27-33	8-13
	7-32	Silty clay, silty clay loam	CL	A-7-6	0	0	88-100	61-100	60-100	55-100	40-46	17-23
	32-60	Extremely paraflaggy silty clay	GC	A-1	40-65	30-45	80-92	65-92	65-90	55-90	41-51	16-25
551G:												
Gosport---------	0-4	Silt loam	CL	A-6, A-4	0	0	85-100	75-100	65-100	55-90	27-33	8-13
	4-34	Silty clay, silty clay loam	CL	A-7-6	0	0	88-100	61-100	60-100	55-100	40-46	17-23
	34-60	Extremely paraflaggy silty clay	GC	A-1	40-65	30-45	80-92	65-92	65-90	55-90	41-51	16-25
581A:												
Tamalco---------	0-8	Silt loam	CL, ML	A-4, A-6	0	0	100	100	95-100	85-100	23-41	7-19
	8-13	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	85-100	21-37	4-17
	13-25	Silty clay loam, silty clay	CL, CH	A-7-6	0	0	100	100	95-100	90-100	45-54	23-30
	25-41	Silty clay loam	CL	A-7-6, A-6	0	0	100	100	95-100	85-99	37-46	16-25
	41-70	Clay loam, loam	CL, ML	A-6, A-4	0	0	100	90-100	75-100	50-85	24-41	7-21

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	
652C2:												
Passport--------	0-4	Silt loam	ML, CL	A-6, A-4	0	0	100	98-100	90-100	65-95	24-40	7-17
	4-38	Silt loam, loam, clay loam, silty clay loam	ML, CL	A-7-6, A-6	0	0	97-100	92-100	80-100	55-90	29-46	12-25
	38-78	Silt loam, loam, clay loam	ML, CL	A-7-6, A-6	0	0	97-100	92-98	75-98	50-85	31-46	13-25
	78-80	Loam, clay loam	SC, ML, CL	A-6, A-4	0	0-2	94-100	85-98	70-95	45-80	24-40	9-21
652D2:												
Passport--------	0-4	Silt loam	ML, CL	A-6, A-4	0	0	100	98-100	90-100	65-95	24-40	7-17
	4-32	Silt loam, loam, clay loam, silty clay loam	ML, CL	A-7-6, A-6	0	0	97-100	92-100	80-100	55-90	29-46	12-25
	32-64	Silt loam, loam, clay loam	ML, CL	A-7-6, A-6	0	0	97-100	92-98	75-98	50-85	31-46	13-25
801B:												
Orthents--------	0-80	Silt loam, silty clay loam	CL, CL-ML	A-4, A-6, A-7-6	0	0	100	100	90-100	80-95	25-45	5-25
810.												
Oil-waste land												
888C2:												
Passport--------	0-4	Silt loam	CL, ML	A-6, A-4	0	0	100	98-100	90-100	65-95	24-40	7-17
	4-38	Silt loam, loam, clay loam, silty clay loam	ML, CL	A-7-6, A-6	0	0	97-100	92-100	80-100	55-90	29-46	12-25
	38-78	Silt loam, loam, clay loam	ML, CL	A-6, A-7-6	0	0	97-100	92-98	75-98	50-85	31-46	13-25
	78-80	Loam, clay loam	SC, ML, CL	A-6, A-4	0	0-2	94-100	85-98	70-95	45-80	24-40	9-21

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	
888C2:												
Grantfork-------	0-4	Silt loam	ML, CL	A-6, A-4	0	0	100	98-100	90-100	65-95	23-39	7-17
	4-9	Silt loam	ML, CL	A-6, A-4	0	0	100	98-100	90-100	65-95	23-36	7-17
	9-30	Silt loam, loam, clay loam, silty clay loam	ML, CL	A-7-6, A-6	0	0	97-100	92-100	80-100	55-90	29-46	12-25
	30-60	Silt loam, loam, clay loam	ML, CL	A-7-6, A-6	0	0	97-100	92-98	75-98	50-85	31-46	13-25
908D2:												
Hickory---------	0-10	Silt loam	CL, ML, CL-ML	A-4	0	0	90-100	80-100	70-100	50-85	22-28	3-8
	10-45	Clay loam, loam	CL, SC, ML	A-6	0	0-2	90-100	75-100	60-97	40-80	32-39	11-18
	45-60	Clay loam, loam	SC-SM, CL-ML, CL, SC, ML	A-4, A-6	0	0-2	90-100	75-95	65-95	40-75	22-34	4-14
Kell------------	0-4	Silt loam	CL, CL-ML	A-4	0	0	90-100	85-100	80-100	60-90	21-27	4-9
	4-17	Silt loam, loam	CL	A-4, A-6	0	0	85-100	75-100	65-100	50-90	27-33	8-13
	17-38	Silty clay loam, clay loam	CL	A-6	0	0-5	85-95	75-95	60-95	50-85	33-38	12-18
	38-80	Extremely paraflaggy loamy sand, extremely paraflaggy sand	SP-SM, SM, SP	A-1-b, A-2-4, A-3	40-65	30-45	70-95	65-85	25-80	0-25	0-15	NP-4
908F:												
Hickory---------	0-4	Silt loam	CL, ML, CL-ML	A-4	0	0	90-100	80-100	70-100	50-85	22-28	3-8
	4-12	Silt loam	CL, ML, CL-ML	A-4	0	0	90-100	80-100	70-100	50-85	22-28	3-8
	12-46	Clay loam, loam	CL, SC, ML	A-6	0	0-2	90-100	75-99	60-97	40-80	32-39	11-18
	46-58	Clay loam, loam	SC-SM, CL-ML, CL, SC, ML	A-4, A-6	0	0-2	90-100	75-95	65-95	40-75	22-34	4-14
	58-80	Loam	SC-SM, CL-ML, CL, SC, ML	A-4, A-6	0	0-2	90-100	75-95	65-95	40-75	22-33	4-13

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	Plas- ticity index
	In				Pct	Pct					Pct	
908F:												
Kell------------	0-3	Silt loam	CL, CL-ML	A-4	0	0	90-100	85-100	80-100	60-90	21-27	4-9
	3-13	Silt loam, loam	CL	A-4, A-6	0	0	85-100	75-100	65-100	50-90	27-33	8-13
	13-25	Silty clay loam, clay loam	CL	A-6	0	0-5	85-95	75-95	60-95	50-85	33-38	12-18
	25-35	Very parachannery silty clay loam, very parachannery clay loam	CL, ML	A-6	0-15	25-40	80-90	70-90	55-90	50-85	33-38	10-16
	35-60	Extremely paraflaggy silty clay loam, extremely paraflaggy clay loam	CL, ML	A-6	40-65	30-45	85-95	80-95	65-95	55-85	33-38	10-16
912A:												
Hoyleton--------	0-8	Silt loam	CL, ML	A-4, A-6, A-7-6	0	0	100	100	95-100	85-100	25-44	7-18
	8-11	Silt loam	CL	A-6	0	0	100	100	95-100	85-100	28-38	12-19
	11-39	Silty clay loam, silty clay	CH, CL	A-7-6	0	0	100	100	95-100	90-100	46-56	25-33
	39-80	Silt loam, silty clay loam, clay loam, loam	CL, ML	A-6, A-7-6	0	0	100	95-100	80-100	60-97	28-46	12-25
Darmstadt-------	0-6	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	90-100	21-37	4-17
	6-14	Silt loam	CL-ML, CL, ML	A-4, A-6	0	0	100	100	95-100	90-100	21-37	5-18
	14-20	Silty clay loam, silty clay	CL	A-7-6, A-6	0	0	100	100	95-100	90-99	39-50	21-30
	20-40	Silty clay loam, silt loam	CL	A-7-6, A-6	0	0	100	100	95-100	90-99	35-46	17-25
	40-60	Clay loam, silt loam, silty clay loam	CL, ML	A-6, A-7-6	0	0	100	91-100	85-100	70-95	31-46	13-25

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	
912B:												
Hoyleton--------	0-8	Silt loam	CL, ML	A-4, A-6, A-7-6	0	0	100	100	95-100	85-100	25-44	7-18
	8-15	Silt loam	CL	A-6	0	0	100	100	95-100	85-100	28-38	12-19
	15-34	Silty clay loam, silty clay	CH, CL	A-7-6	0	0	100	100	95-100	90-100	46-56	25-33
	34-60	Silt loam, silty clay loam, clay loam, loam	CL, ML	A-6, A-7-6	0	0	100	95-100	80-100	60-97	28-46	12-25
Darmstadt-------	0-9	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	90-100	21-37	4-17
	9-13	Silt loam	CL-ML, CL, ML	A-4, A-6	0	0	100	100	95-100	90-100	21-37	5-18
	13-21	Silty clay loam, silty clay	CL	A-7-6, A-6	0	0	100	100	95-100	90-99	39-50	21-30
	21-27	Silty clay loam, silt loam	CL	A-7-6, A-6	0	0	100	100	95-100	90-99	35-46	17-25
	27-60	Clay loam, silt loam, silty clay loam	CL	A-6, A-7-6	0	0	100	91-100	85-100	70-95	29-44	13-25
912B2:												
Hoyleton--------	0-7	Silt loam	CL, ML	A-4, A-6, A-7-6	0	0	100	100	95-100	85-100	24-42	7-18
	7-30	Silty clay loam, silty clay	CH, CL	A-7-6	0	0	100	100	95-100	90-100	46-56	25-33
	30-60	Silt loam, silty clay loam, clay loam, loam	CL, ML	A-6, A-7-6	0	0	100	95-100	80-100	60-97	28-46	12-25
Darmstadt-------	0-7	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	90-100	21-37	4-17
	7-14	Silty clay loam, silty clay	CL	A-7-6, A-6	0	0	100	100	95-100	90-99	39-50	21-30
	14-20	Silty clay loam, silt loam	CL	A-7-6, A-6	0	0	100	100	95-100	90-99	35-46	17-25
	20-60	Clay loam, silt loam, silty clay loam	CL	A-6, A-7-6	0	0	100	91-100	85-100	70-95	29-44	13-25

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	Plas-ticity index
	In				Pct	Pct					Pct	
914C2:												
Atlas-----------	0-4	Silt loam	CL, ML	A-4, A-6	0	0	100	91-100	85-100	65-98	24-37	7-18
	4-34	Clay loam, silty clay loam, silty clay, clay	CL	A-7-6	0	0	95-100	90-100	80-98	60-90	42-50	20-28
	34-68	Clay loam, loam	ML, CL	A-6	0	0	95-100	80-100	75-98	50-85	30-40	10-20
Grantfork-------	0-6	Silt loam	CL, ML	A-4, A-6	0	0	100	91-100	85-100	65-98	26-39	9-17
	6-31	Clay loam, silty clay loam, silty clay, clay	CL, CH	A-7-6	0	0	95-100	87-98	80-95	60-85	44-55	25-32
	31-60	Silty clay loam, clay loam, clay, silty clay	CL	A-6, A-7-6	0	0	96-100	79-97	70-95	50-85	38-50	21-32
929D2:												
Ava-------------	0-5	Silt loam	CL	A-4, A-6	0	0	100	100	95-100	90-99	26-36	9-15
	5-25	Silty clay loam, silt loam	CL	A-6, A-7-6	0	0	100	100	95-100	90-100	35-47	17-25
	25-60	Silty clay loam, silt loam, loam, clay loam	CL	A-6, A-7-6	0	0	100	93-100	85-100	65-90	31-42	13-21
Hickory---------	0-10	Silt loam	CL, ML, CL-ML	A-6, A-4	0	0	90-100	80-100	75-100	55-95	21-35	5-15
	10-45	Clay loam, loam	CL, SC, ML	A-6	0	0-1	90-100	75-99	60-97	40-80	32-39	11-18
	45-60	Clay loam, loam	CL, SC, SC-SM, CL-ML, ML	A-6, A-4	0	0-1	90-100	75-95	65-95	40-75	22-34	4-14
947D2:												
Hickory---------	0-10	Silt loam	CL, ML, CL-ML	A-6, A-4	0	0	90-100	80-100	75-100	55-95	21-35	5-15
	10-45	Clay loam, loam	ML, CL, SC	A-6	0	0-1	90-100	75-99	60-97	40-80	32-39	11-18
	45-60	Clay loam, loam	ML, CL, SC, SC-SM, CL-ML	A-4, A-6	0	0-1	90-100	75-95	65-95	40-75	22-34	4-14

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	
947D2:												
Passport--------	0-4	Silt loam	ML, CL	A-6, A-4	0	0	100	98-100	90-100	65-95	24-40	7-17
	4-32	Silt loam, loam, clay loam, silty clay loam	ML, CL	A-7-6, A-6	0	0	97-100	92-100	80-100	55-90	29-46	12-25
	32-64	Silt loam, loam, clay loam	ML, CL	A-7-6, A-6	0	0	97-100	92-98	75-98	50-85	31-46	13-25
947D3:												
Hickory---------	0-10	Clay loam	CL	A-6	0	0	90-100	75-100	70-98	50-85	30-40	15-20
	10-45	Clay loam, loam	ML, CL, SC	A-6	0	0-2	90-100	75-99	60-97	40-80	32-39	11-18
	45-60	Clay loam, loam	ML, CL, SC, SC-SM, CL-ML	A-4, A-6	0	0-2	90-100	75-95	65-95	40-75	22-34	4-14
Passport--------	0-4	Clay loam	CL	A-6	0	0	97-100	91-100	85-98	60-85	30-40	15-20
	4-32	Silt loam, loam, clay loam, silty clay loam	ML, CL	A-7-6, A-6	0	0	97-100	92-100	80-100	55-90	29-46	12-25
	32-64	Silt loam, loam, clay loam	ML, CL	A-7-6, A-6	0	0	97-100	92-98	75-98	50-85	31-46	13-25
967F:												
Hickory---------	0-4	Silt loam	CL, ML, CL-ML	A-6, A-4	0	0-5	95-100	91-100	85-100	65-95	21-35	5-15
	4-12	Silt loam, loam	CL	A-6, A-4	0	0-5	95-100	91-100	80-100	50-90	25-30	7-15
	12-46	Clay loam, loam, silty clay loam, gravelly clay loam	CL, ML, SC	A-6	0-1	0-5	85-100	70-100	60-100	40-90	31-40	11-18
	46-58	Loam, clay loam, gravelly clay loam	SC, CL, SC-SM, ML, CL-ML	A-6, A-4	0-1	0-5	85-100	70-100	55-100	36-85	25-40	6-16
	58-80	Loam, sandy loam, gravelly clay loam	CL, SC-SM, SC, CL-ML, ML	A-6, A-4, A-2-6, A-2-4	0-1	0-5	85-100	70-97	55-97	30-80	25-35	6-15

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	
967F:												
Gosport---------	0-4	Silt loam	CL	A-6, A-4	0	0	85-100	75-100	65-100	55-90	27-33	8-13
	4-7	Silt loam	CL	A-6, A-4	0	0	85-100	75-100	65-100	55-90	27-33	8-13
	7-32	Silty clay, silty clay loam	CL	A-7-6	0	0	88-100	61-100	60-100	55-100	40-46	17-23
	32-60	Extremely paraflaggy silty clay	GC	A-1	40-65	30-45	80-92	65-92	65-90	55-90	41-51	16-25
991A:												
Cisne-----------	0-8	Silt loam	CL, CL-ML, ML	A-6, A-4	0	0	100	100	95-100	90-100	23-38	6-13
	8-17	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	90-100	21-32	6-13
	17-37	Silty clay loam, silty clay	CH, CL	A-7-6	0	0	100	100	95-100	90-100	46-56	25-33
	37-60	Silty clay loam, silt loam, clay loam, loam	CL	A-6, A-7-6	0	0	95-100	84-100	75-99	60-90	31-46	13-25
	60-80	Silt loam, loam, clay loam, silty clay loam	CL	A-7-6, A-6	0	0	95-100	82-97	75-97	55-90	29-44	13-25
Huey------------	0-8	Silt loam	CL, CL-ML, ML	A-6, A-4	0	0	100	100	95-100	90-100	22-36	6-13
	8-10	Silt, silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	90-100	21-32	6-13
	10-18	Silty clay loam, silt loam	CL	A-7-6, A-6	0	0	100	100	95-100	90-100	35-46	17-25
	18-49	Silty clay loam, silt loam, silty clay	CL	A-6, A-7-6	0	0	100	100	95-100	90-100	35-50	17-30
	49-65	Silt loam, loam, silty clay loam	CL	A-7-6, A-6	0	0	95-100	82-97	75-97	55-90	29-44	13-25
1524A:												
Zipp------------	0-3	Silty clay loam	CH, MH, CL	A-6, A-7-6, A-7-5	0	0	100	100	95-100	85-97	39-55	19-28
	3-60	Silty clay, silty clay loam	CH, CL, MH	A-7-6, A-7-5	0	0	100	100	95-100	90-100	46-67	25-40

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	
3072A:												
Sharon----------	0-7	Silt loam	CL, ML	A-6, A-4	0	0	100	100	90-100	60-99	23-37	7-13
	7-25	Silt loam	CL, ML	A-6, A-4	0	0	100	100	90-100	75-100	16-31	2-12
	25-61	Silt loam	CL, ML, CL-ML	A-6, A-4	0	0	100	100	90-100	75-100	16-30	2-12
3108A:												
Bonnie----------	0-10	Silt loam	CL	A-4, A-6	0	0	100	100	97-100	93-100	27-34	8-12
	10-27	Silt loam	CL	A-4, A-6	0	0	100	100	95-100	90-99	27-34	8-12
	27-80	Silt loam, silty clay loam	CL	A-6, A-4	0	0	100	100	92-100	87-99	25-39	8-15
3108T:												
Bonnie----------	0-12	Silt loam	ML, CL	A-7-6, A-4, A-6	0	0	100	100	95-100	85-100	24-43	7-18
	12-23	Silt loam	CL	A-6	0	0	100	100	95-100	85-100	27-38	12-19
	23-64	Silt loam	CL	A-6	0	0	100	100	95-100	85-100	27-38	12-19
	64-80	Silty clay loam	CL	A-6, A-7-6	0	0	100	100	95-100	85-100	37-46	19-25
3225A:												
Holton----------	0-9	Silt loam	CL-ML, CL, ML	A-4, A-6	0	0	100	94-100	80-100	55-90	20-35	3-12
	9-26	Silt loam, loam, fine sandy loam	CL-ML, ML, SC-SM, SM, SC, CL	A-4, A-6	0	0	97-100	80-100	65-100	36-90	17-31	2-12
	26-60	Loam, fine sandy loam, sandy loam	CL-ML, ML, SC-SM, SM, SC, CL	A-2-4, A-4	0	0-1	92-100	72-100	51-100	20-75	17-28	2-10
3226A:												
Wirt------------	0-3	Silt loam	CL-ML, CL	A-4	0	0	100	95-100	80-100	60-90	20-30	5-10
	3-32	Silt loam, loam, fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	97-100	80-100	65-100	36-90	15-25	NP-7
	32-60	Stratified silt loam to loam to sandy loam	CL-ML, ML, SM	A-2-4, A-4, A-1-b	0	0-1	90-100	75-100	40-100	15-85	10-25	NP-7
3333A:												
Wakeland--------	0-9	Silt loam	CL-ML, CL, ML	A-4	0	0	100	100	95-100	75-100	19-27	2-10
	9-60	Silt loam	CL, ML	A-4	0	0	100	100	90-100	75-100	19-27	2-10
3334A:												
Birds-----------	0-6	Silt loam	CL, ML, CL-ML	A-4, A-6	0	0	100	100	95-100	80-99	24-35	6-14
	6-80	Silt loam	CL	A-6, A-4	0	0	100	100	95-100	80-99	27-37	9-18

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	
3382A:												
Belknap---------	0-13	Silt loam	CL, ML	A-4, A-6	0	0	100	100	95-100	85-100	24-37	7-13
	13-27	Silt loam, silt	CL-ML, ML, CL	A-4, A-6	0	0	100	95-100	90-100	80-100	18-33	4-12
	27-65	Silt loam, silt	CL, CL-ML, ML	A-4, A-6	0	0	100	95-100	85-100	65-99	18-37	4-17
3415A:												
Orion-----------	0-7	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	80-95	22-37	6-13
	7-24	Silt loam, loam	CL, CL-ML, ML	A-6, A-4	0	0	100	100	90-100	60-95	21-33	6-12
	24-42	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	95-100	85-100	75-100	55-95	22-40	6-17
	42-60	Loam, silt loam	CL-ML, CL	A-6, A-4	0	0	95-100	90-100	80-100	55-95	21-31	6-12
7337B:												
Creal-----------	0-6	Silt loam	ML, CL	A-7-6, A-6	0	0	100	100	95-100	90-100	29-42	12-18
	6-27	Silt loam	CL	A-6	0	0	100	100	95-100	85-100	28-36	12-17
	27-44	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	95-100	90-100	35-46	17-25
	44-60	Silt loam, silty clay loam	CL	A-6	0	0	100	100	95-100	80-100	29-40	13-21
8787A:												
Banlic----------	0-9	Silt loam	ML, CL	A-6, A-4	0	0	100	100	95-100	85-100	24-34	7-12
	9-30	Silt loam	CL	A-4, A-6	0	0	100	100	95-100	85-100	22-30	7-12
	30-50	Silt, silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	85-100	21-30	6-12
	50-60	Silt loam	CL	A-4, A-6	0	0	100	100	95-100	85-97	22-29	7-12

Table 19.--Physical Properties of the Soils

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer. Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
2A:														
Cisne---------------	0-8	1-10	70-83	10-20	1.30-1.50	0.6-2	0.19-0.25	0.0-2.9	1.5-3.5	.37	.37	3	5	56
	8-17	0-10	70-87	10-20	1.40-1.60	0.2-0.6	0.18-0.24	0.0-2.9	0.3-0.8	.64	.64			
	17-37	0-10	50-65	35-45	1.30-1.50	0.02-0.2	0.12-0.18	6.0-8.9	0.2-0.5	.43	.43			
	37-60	15-30	38-61	20-35	1.50-1.70	0.06-0.2	0.11-0.17	3.0-5.9	0.0-0.5	.43	.43			
	60-80	15-35	31-62	20-35	1.50-1.70	0.2-0.6	0.13-0.19	0.0-2.9	0.0-0.3	.43	.43			
3A:														
Hoyleton------------	0-8	1-16	57-87	12-27	1.30-1.50	0.6-2	0.19-0.25	0.0-2.9	1.5-3.5	.37	.37	5	5	56
	8-11	1-16	57-81	18-27	1.30-1.50	0.2-0.6	0.16-0.22	0.0-2.9	0.3-0.8	.55	.55			
	11-39	1-10	45-64	35-45	1.30-1.50	0.06-0.6	0.11-0.17	6.0-8.9	0.2-0.5	.37	.37			
	39-80	6-40	25-75	19-35	1.40-1.60	0.2-0.6	0.15-0.18	0.0-5.9	0.0-0.3	.43	.49			
3B:														
Hoyleton------------	0-8	1-16	57-87	12-27	1.30-1.50	0.6-2	0.20-0.24	0.0-2.9	1.5-3.5	.37	.37	5	5	56
	8-15	1-16	57-81	18-27	1.30-1.50	0.2-0.6	0.17-0.21	0.0-2.9	0.3-0.8	.55	.55			
	15-34	1-10	45-64	35-45	1.30-1.50	0.06-0.6	0.12-0.16	6.0-8.9	0.2-0.5	.37	.37			
	34-60	6-40	25-75	19-35	1.40-1.60	0.2-0.6	0.15-0.18	0.0-5.9	0.0-0.3	.43	.49			
3B2:														
Hoyleton------------	0-7	1-16	57-87	12-27	1.30-1.50	0.6-2	0.20-0.24	0.0-2.9	1.0-2.5	.37	.37	5	6	48
	7-30	1-10	45-64	35-45	1.30-1.50	0.06-0.6	0.12-0.16	6.0-8.9	0.2-0.5	.32	.32			
	30-60	6-40	25-75	19-35	1.40-1.60	0.2-0.6	0.15-0.18	0.0-5.9	0.0-0.3	.43	.49			
4B:														
Richview------------	0-8	2-14	70-82	15-22	1.30-1.50	0.6-2	0.20-0.26	0.0-2.9	1.5-3.5	.37	.37	5	5	56
	8-12	2-13	67-82	15-25	1.35-1.55	0.6-2	0.17-0.23	0.0-2.9	0.3-0.8	.55	.55			
	12-38	1-12	55-72	25-35	1.35-1.55	0.6-2	0.13-0.19	3.0-5.9	0.2-0.5	.43	.43			
	38-46	15-35	38-65	18-30	1.50-1.70	0.6-2	0.13-0.19	0.0-2.9	0.1-0.3	.43	.43			
	46-60	25-60	25-60	5-20	1.45-1.65	0.6-2	0.15-0.21	0.0-2.9	0.0-0.3	.49	.55			
4C2:														
Richview------------	0-7	2-14	70-82	15-22	1.30-1.50	0.6-2	0.18-0.24	0.0-2.9	1.0-2.5	.37	.37	5	6	48
	7-12	2-13	67-82	15-25	1.35-1.55	0.6-2	0.17-0.23	0.0-2.9	0.3-0.8	.55	.55			
	12-40	1-12	55-72	25-35	1.35-1.55	0.6-2	0.13-0.19	3.0-5.9	0.2-0.5	.43	.43			
	40-60	15-35	38-65	18-30	1.50-1.70	0.6-2	0.13-0.19	0.0-2.9	0.1-0.3	.43	.43			
	60-80	25-60	25-60	5-20	1.50-1.70	2-6	0.09-0.15	0.0-2.9	0.0-0.3	.37	.37			
5C3:														
Blair---------------	0-4	8-20	50-65	27-30	1.40-1.60	0.6-2	0.12-0.18	3.0-5.9	0.3-1.0	.28	.28	4	6	48
	4-20	1-14	54-70	27-35	1.30-1.50	0.2-0.6	0.13-0.19	3.0-5.9	0.2-0.5	.43	.43			
	20-60	15-30	38-61	20-35	1.55-1.75	0.2-0.6	0.09-0.15	3.0-5.9	0.0-0.2	.37	.37			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
7C2:														
Atlas---------------	0-4	4-29	55-81	15-27	1.35-1.55	0.6-2	0.17-0.23	0.0-2.9	0.5-2.0	.43	.43	3	6	48
	4-34	15-35	30-45	35-42	1.45-1.65	0.06-0.2	0.10-0.16	3.0-5.9	0.2-0.5	.24	.24			
	34-68	20-45	30-50	25-35	1.50-1.75	0.06-0.6	0.09-0.15	3.0-5.9	0.0-0.3	.32	.37			
7C3:														
Atlas---------------	0-2	8-20	50-65	27-30	1.40-1.60	0.2-0.6	0.12-0.18	3.0-5.9	0.3-1.0	.32	.32	2	6	48
	2-24	15-35	30-45	35-42	1.45-1.65	0.06-0.2	0.10-0.16	3.0-5.9	0.2-0.5	.24	.24			
	24-68	15-35	30-45	35-42	1.45-1.65	0.02-0.2	0.10-0.16	3.0-5.9	0.0-0.3	.32	.32			
7D2:														
Atlas---------------	0-6	4-29	55-81	15-27	1.35-1.55	0.6-2	0.18-0.22	0.0-2.9	0.5-2.0	.43	.43	3	6	48
	6-50	15-35	30-45	35-42	1.45-1.65	0.06-0.2	0.10-0.16	3.0-5.9	0.2-0.5	.24	.24			
	50-65	20-45	30-50	25-35	1.50-1.75	0.06-0.6	0.06-0.15	3.0-5.9	0.0-0.3	.32	.37			
7D3:														
Atlas---------------	0-5	8-20	50-65	27-30	1.40-1.60	0.2-0.6	0.12-0.18	3.0-5.9	0.3-1.0	.32	.32	2	6	48
	5-37	15-35	30-45	35-42	1.45-1.65	0.06-0.2	0.10-0.16	3.0-5.9	0.2-0.5	.24	.24			
	37-60	15-35	30-45	35-42	1.45-1.65	0.02-0.2	0.10-0.16	3.0-5.9	0.0-0.3	.32	.32			
8D3:														
Hickory-------------	0-8	20-43	30-50	27-35	1.40-1.65	0.6-2	0.17-0.19	3.0-5.9	0.5-1.0	.24	.24	4	6	48
	8-46	20-45	30-50	24-35	1.45-1.65	0.6-2	0.15-0.19	3.0-5.9	0.1-0.5	.28	.32			
	46-58	25-49	28-50	15-32	1.50-1.70	0.6-2	0.11-0.19	0.0-2.9	0.0-0.2	.28	.32			
	58-80	30-55	25-50	15-30	1.50-1.75	0.6-2	0.10-0.15	0.0-2.9	0.0-0.2	.28	.32			
8F:														
Hickory-------------	0-4	10-30	50-78	12-25	1.30-1.50	0.6-2	0.17-0.23	0.0-2.9	1.0-3.0	.32	.32	5	5	56
	4-12	15-45	33-70	15-22	1.30-1.50	0.6-2	0.14-0.20	0.0-2.9	0.1-0.5	.43	.49			
	12-46	15-45	30-50	24-35	1.45-1.65	0.6-2	0.10-0.16	3.0-5.9	0.1-0.5	.28	.32			
	46-58	25-49	28-50	15-32	1.50-1.70	0.2-2	0.10-0.16	0.0-2.9	0.1-0.5	.32	.37			
	58-80	30-55	25-50	15-30	1.50-1.75	0.2-0.6	0.09-0.15	0.0-2.9	0.1-0.5	.37	.43			
8G:														
Hickory-------------	0-5	30-50	35-50	12-20	1.25-1.45	0.6-2	0.14-0.20	0.0-2.9	1.0-3.0	.32	.32	5	5	56
	5-8	30-50	35-50	12-20	1.35-1.55	0.6-2	0.12-0.18	0.0-2.9	0.5-1.5	.37	.43			
	8-52	25-50	25-45	25-35	1.50-1.70	0.6-2	0.09-0.15	3.0-5.9	0.1-0.5	.24	.32			
	52-60	30-50	30-45	10-27	1.60-1.80	0.2-0.6	0.08-0.14	0.0-2.9	0.0-0.3	.32	.37			
10C:														
Plumfield-----------	0-5	2-15	55-70	27-35	1.35-1.55	0.2-0.6	0.13-0.19	3.0-5.9	0.3-1.0	.43	.43	3	6	48
	5-12	5-15	60-75	20-30	1.40-1.60	0.02-0.06	0.12-0.18	3.0-5.9	0.2-0.5	.49	.55			
	12-36	10-25	50-65	20-30	1.40-1.60	0.02-0.06	0.04-0.10	0.0-2.9	0.1-0.3	.55	.55			
	36-70	15-35	35-60	20-35	1.50-1.70	0.2-0.6	0.11-0.17	3.0-5.9	0.0-0.2	.37	.43			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	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
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
12A:														
Wynoose-------------	0-7	0-15	68-80	10-20	1.30-1.50	0.6-2	0.19-0.25	0.0-2.9	1.0-2.5	.43	.43	3	5	56
	7-20	0-15	67-80	10-20	1.30-1.50	0.2-0.6	0.19-0.25	0.0-2.9	0.3-0.8	.64	.64			
	20-36	0-10	51-64	35-42	1.30-1.50	0.02-0.2	0.11-0.17	6.0-8.9	0.2-0.5	.37	.37			
	36-66	15-30	39-59	25-35	1.50-1.70	0.06-0.2	0.11-0.17	3.0-5.9	0.0-0.3	.43	.43			
	66-80	15-36	39-59	25-35	1.50-1.70	0.06-0.2	0.11-0.17	3.0-5.9	0.0-0.3	.43	.43			
13A:														
Bluford-------------	0-7	5-12	70-79	10-18	1.30-1.50	0.6-2	0.19-0.25	0.0-2.9	1.0-2.5	.43	.43	4	5	56
	7-20	5-10	70-80	15-25	1.35-1.55	0.2-0.6	0.19-0.25	0.0-2.9	0.2-0.8	.55	.55			
	20-35	0-8	50-64	35-45	1.30-1.50	0.06-0.6	0.11-0.17	6.0-8.9	0.2-0.5	.37	.37			
	35-60	15-30	40-64	20-35	1.50-1.70	0.06-0.2	0.07-0.13	3.0-5.9	0.0-0.3	.43	.49			
13B:														
Bluford-------------	0-7	5-12	70-79	10-18	1.30-1.50	0.6-2	0.19-0.25	0.0-2.9	1.0-2.5	.43	.43	4	5	56
	7-20	5-10	70-80	15-25	1.35-1.55	0.2-0.6	0.20-0.26	0.0-2.9	0.2-1.5	.55	.55			
	20-35	0-8	50-64	35-45	1.30-1.50	0.2-0.6	0.11-0.17	6.0-8.9	0.2-0.5	.37	.37			
	35-60	15-30	40-64	20-35	1.50-1.70	0.06-0.2	0.07-0.13	3.0-5.9	0.0-0.3	.43	.49			
13B2:														
Bluford-------------	0-9	2-14	70-82	15-22	1.30-1.50	0.6-2	0.18-0.24	0.0-2.9	0.5-2.0	.37	.37	4	6	48
	9-37	1-13	50-62	35-42	1.30-1.50	0.06-0.6	0.11-0.17	6.0-9.0	0.2-0.5	.32	.32			
	37-60	15-30	43-64	20-30	1.50-1.70	0.06-0.2	0.07-0.13	3.0-5.9	0.0-0.3	.43	.43			
14B:														
Ava-----------------	0-6	2-8	73-83	12-20	1.35-1.55	0.6-2	0.19-0.25	0.0-2.9	1.0-2.5	.43	.43	4	5	56
	6-14	2-8	73-83	12-20	1.35-1.55	0.2-0.6	0.19-0.25	0.0-2.9	0.3-0.8	.64	.64			
	14-34	0-8	58-74	25-35	1.35-1.55	0.6-2	0.13-0.19	3.0-5.9	0.2-0.5	.49	.49			
	34-50	16-30	42-61	20-30	1.55-1.75	0.02-0.06	0.02-0.08	3.0-5.9	0.0-0.3	.49	.49			
	50-60	16-30	42-61	20-30	1.55-1.75	0.06-0.6	0.10-0.16	0.0-2.9	0.0-0.3	.49	.49			
14C2:														
Ava-----------------	0-7	2-14	70-82	15-22	1.30-1.50	0.6-2	0.18-0.24	0.0-2.9	0.5-2.0	.37	.37	4	6	48
	7-31	0-8	58-74	25-35	1.35-1.55	0.2-0.6	0.13-0.19	3.0-5.9	0.3-0.8	.43	.43			
	31-50	16-30	42-61	20-30	1.55-1.75	0.02-0.06	0.02-0.08	3.0-5.9	0.2-0.5	.43	.43			
	50-60	16-25	45-61	20-30	1.55-1.75	0.06-0.6	0.12-0.18	0.0-2.9	0.0-0.3	.43	.43			
15B2:														
Parke---------------	0-7	3-15	58-85	12-27	1.35-1.55	0.6-2	0.19-0.25	0.0-2.9	0.5-2.0	.43	.43	5	5	56
	7-19	3-10	60-79	18-30	1.40-1.60	0.6-2	0.12-0.18	3.0-5.9	0.2-0.5	.43	.49			
	19-38	15-35	38-67	18-27	1.50-1.70	0.6-2	0.13-0.19	0.0-2.9	0.2-0.5	.43	.43			
	38-68	50-70	15-40	10-30	1.50-1.70	0.6-2	0.09-0.15	0.0-2.9	0.0-0.5	.24	.24			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	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
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
109A:														
Racoon--------------	0-6	1-14	62-84	14-25	1.30-1.50	0.6-2	0.19-0.25	0.0-2.9	1.0-2.5	.43	.43	5	5	56
	6-30	1-14	62-83	15-25	1.35-1.55	0.2-0.6	0.17-0.23	0.0-2.9	0.3-0.8	.55	.55			
	30-59	1-15	52-71	27-35	1.35-1.55	0.06-0.2	0.13-0.19	3.0-5.9	0.2-0.5	.49	.49			
	59-73	10-35	40-71	18-27	1.50-1.70	0.2-0.6	0.13-0.19	0.0-2.9	0.0-0.2	.55	.55			
120A:														
Huey----------------	0-8	1-10	70-83	10-20	1.30-1.50	0.6-2	0.19-0.25	0.0-2.9	1.0-2.5	.43	.43	2	5	56
	8-10	0-10	70-87	10-20	1.40-1.60	0.2-0.6	0.18-0.24	0.0-2.9	0.3-0.8	.64	.64			
	10-15	1-8	59-71	25-35	1.30-1.50	0.06-0.6	0.13-0.19	3.0-5.9	0.2-0.5	.49	.49			
	15-49	1-8	59-71	25-35	1.30-1.50	0.02-0.06	0.13-0.19	3.0-5.9	0.0-0.3	.49	.49			
	49-65	15-35	31-62	20-35	1.50-1.70	0.02-0.6	0.13-0.19	0.0-2.9	0.0-0.3	.43	.43			
218A:														
Newberry------------	0-9	1-12	70-87	12-20	1.35-1.55	0.6-2	0.19-0.25	0.0-2.9	1.5-3.5	.37	.37	5	5	56
	9-16	1-12	72-82	12-20	1.40-1.60	0.2-0.6	0.18-0.24	0.0-2.9	0.3-0.8	.64	.64			
	16-35	1-8	59-71	25-35	1.30-1.50	0.06-0.6	0.13-0.19	3.0-5.9	0.2-0.5	.43	.43			
	35-48	10-25	41-64	24-35	1.45-1.65	0.06-0.6	0.12-0.18	3.0-5.9	0.0-0.5	.43	.43			
	48-80	10-25	40-55	35-40	1.50-1.70	0.06-0.6	0.10-0.16	6.0-8.9	0.0-0.3	.32	.32			
421G:														
Kell----------------	0-3	15-30	53-70	12-18	1.40-1.60	0.6-2	0.16-0.22	0.0-2.9	1.0-2.5	.32	.32	3	5	56
	3-13	15-35	40-60	18-27	1.40-1.55	0.6-2	0.13-0.19	0.0-2.9	0.1-0.5	.37	.43			
	13-25	15-35	30-58	27-35	1.40-1.60	0.6-2	0.11-0.17	3.0-5.9	0.1-0.5	.32	.37			
	25-35	15-35	30-58	27-35	1.65-1.85	0.2-2	0.06-0.12	3.0-5.9	0.0-0.3	.32	.43			
	35-60	15-35	30-58	27-35	1.85-2.05	0.01-0.6	0.00-0.04	3.0-5.9	0.0-0.1	.37	.43			
533:														
Urban land----------	---	---	---	---	---	---	---	---	---	---	---	--	8	0
551D2:														
Gosport-------------	0-3	15-30	50-60	18-27	1.40-1.60	0.6-2	0.15-0.21	0.0-2.9	1.0-2.5	.32	.32	3	5	56
	3-34	1-9	47-59	38-45	1.30-1.50	0.06-0.2	0.09-0.15	6.0-8.9	0.1-0.4	.24	.28			
	34-60	0-20	40-60	40-55	1.40-1.80	0.02-0.06	0.04-0.10	0.0-2.9	0.0-0.1	.05	.32			
551F:														
Gosport-------------	0-4	15-30	50-60	18-27	1.40-1.60	0.6-2	0.15-0.21	0.0-2.9	1.0-2.5	.32	.32	3	5	56
	4-7	15-30	50-60	18-27	1.40-1.60	0.2-0.6	0.13-0.19	0.0-2.9	0.1-0.5	.43	.49			
	7-32	1-9	47-59	38-45	1.30-1.50	0.06-0.2	0.09-0.15	6.0-8.9	0.1-0.4	.28	.37			
	32-60	0-20	40-60	40-55	1.40-1.80	0.02-0.06	0.04-0.10	0.0-2.9	0.0-0.1	.05	.32			
551G:														
Gosport-------------	0-4	15-30	50-60	18-27	1.40-1.60	0.2-2	0.15-0.21	0.0-2.9	1.0-2.5	.32	.32	3	5	56
	4-34	1-9	47-59	38-45	1.30-1.50	0.06-0.2	0.09-0.15	6.0-8.9	0.1-0.4	.24	.28			
	34-60	0-20	40-60	40-55	1.40-1.80	0.02-0.06	0.04-0.10	0.0-2.9	0.0-0.1	.05	.32			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
581A:														
Tamalco	0-8	1-16	57-87	12-27	1.40-1.60	0.6-2	0.18-0.24	0.0-2.9	0.5-2.0	.43	.43	3	5	56
	8-13	1-16	57-87	12-27	1.40-1.60	0.2-0.6	0.17-0.23	0.0-2.9	0.3-0.8	.64	.64			
	13-25	1-13	50-62	35-42	1.30-1.50	0.06-0.6	0.12-0.18	6.0-8.9	0.2-0.5	.43	.43			
	25-41	2-16	49-71	27-35	1.35-1.55	0.02-0.06	0.13-0.19	3.0-5.9	0.1-0.3	.49	.49			
	41-70	20-45	30-50	15-30	1.45-1.65	0.02-0.2	0.10-0.16	0.0-2.9	0.0-0.3	.43	.49			
652C2:														
Passport	0-4	10-35	50-75	12-25	1.40-1.60	0.2-0.6	0.18-0.22	0.0-2.9	1.0-2.5	.43	.43	5	5	56
	4-38	15-40	30-60	18-35	1.50-1.70	0.2-0.6	0.11-0.15	3.0-5.9	0.2-0.5	.32	.32			
	38-78	25-45	28-53	20-35	1.55-1.75	0.06-0.2	0.10-0.14	3.0-5.9	0.2-0.5	.37	.37			
	78-80	30-50	28-50	15-30	1.60-1.80	0.06-0.2	0.10-0.14	0.0-2.9	0.0-0.3	.37	.43			
652D2:														
Passport	0-4	10-35	50-75	12-25	1.40-1.60	0.2-0.6	0.17-0.23	0.0-2.9	1.0-2.5	.37	.37	5	5	56
	4-32	15-40	30-60	18-35	1.50-1.70	0.2-0.6	0.10-0.16	3.0-5.9	0.2-0.5	.32	.32			
	32-64	25-45	28-53	20-35	1.55-1.75	0.06-0.2	0.09-0.15	3.0-5.9	0.2-0.5	.37	.37			
801B:														
Orthents	0-80	0-20	50-70	20-35	1.35-1.55	0.2-2	0.18-0.22	3.0-5.9	0.2-1.0	.43	.43	5	4	86
810.														
Oil-waste land														
888C2:														
Passport	0-4	10-35	50-75	12-25	1.40-1.60	0.2-0.6	0.18-0.22	0.0-2.9	1.0-2.5	.43	.43	5	5	56
	4-38	15-40	30-60	18-35	1.50-1.70	0.2-0.6	0.11-0.15	3.0-5.9	0.2-0.5	.32	.32			
	38-78	25-45	28-53	20-35	1.55-1.75	0.06-0.2	0.10-0.14	3.0-5.9	0.2-0.5	.37	.37			
	78-80	30-50	28-50	15-30	1.60-1.80	0.06-0.2	0.10-0.14	0.0-2.9	0.0-0.3	.37	.43			
Grantfork	0-4	10-35	50-75	12-25	1.40-1.60	0.6-2	0.18-0.22	0.0-2.9	0.5-2.0	.43	.43	5	5	56
	4-9	10-35	50-75	12-25	1.40-1.60	0.2-0.6	0.18-0.22	0.0-2.9	0.3-0.8	.55	.55			
	9-30	15-40	30-60	18-35	1.50-1.70	0.2-0.6	0.11-0.15	3.0-5.9	0.2-0.5	.37	.37			
	30-60	25-45	28-53	20-35	1.55-1.75	0.06-0.2	0.10-0.14	3.0-5.9	0.2-0.5	.37	.37			
908D2:														
Hickory	0-10	20-40	50-70	10-20	1.40-1.60	0.6-2	0.15-0.21	0.0-2.9	1.0-2.5	.32	.32	5	5	56
	10-45	25-50	25-45	25-35	1.50-1.70	0.6-2	0.09-0.15	3.0-5.9	0.1-0.5	.24	.28			
	45-60	30-50	30-45	10-30	1.60-1.80	0.2-0.6	0.07-0.13	3.0-5.9	0.0-0.3	.28	.32			
Kell	0-4	15-30	53-70	12-18	1.40-1.60	0.6-2	0.16-0.22	0.0-2.9	1.0-2.5	.32	.32	3	5	56
	4-17	15-35	40-60	18-27	1.40-1.55	0.6-2	0.10-0.16	0.0-2.9	0.1-0.5	.37	.43			
	17-38	15-35	30-58	27-35	1.40-1.60	0.6-2	0.09-0.15	3.0-5.9	0.1-0.5	.28	.32			
	38-80	75-99	0-20	0-5	1.85-2.05	0.01-0.6	0.00-0.03	0.0-2.9	0.0-0.1	.05	.05			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	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
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
908F:														
Hickory-------------	0-4	20-40	50-70	10-20	1.30-1.50	0.6-2	0.16-0.22	0.0-2.9	1.0-3.0	.32	.32	5	5	56
	4-12	20-40	50-70	10-20	1.35-1.55	0.6-2	0.15-0.21	0.0-2.9	0.1-0.5	.49	.55			
	12-46	25-50	25-45	25-35	1.50-1.70	0.6-2	0.09-0.15	3.0-5.9	0.1-0.5	.24	.32			
	46-58	30-50	30-45	10-28	1.55-1.75	0.2-2	0.09-0.15	0.0-2.9	0.1-0.3	.28	.32			
	58-80	30-50	30-45	10-27	1.60-1.80	0.2-0.6	0.08-0.14	0.0-2.9	0.0-0.3	.32	.37			
Kell----------------	0-3	15-30	53-70	12-18	1.40-1.60	0.6-2	0.16-0.22	0.0-2.9	1.0-2.5	.32	.32	3	5	56
	3-13	15-35	40-60	18-27	1.40-1.55	0.6-2	0.13-0.19	0.0-2.9	0.1-0.5	.37	.43			
	13-25	15-35	30-58	27-35	1.40-1.60	0.6-2	0.11-0.17	3.0-5.9	0.1-0.5	.32	.37			
	25-35	15-35	30-58	27-35	1.65-1.85	0.2-2	0.06-0.12	3.0-5.9	0.0-0.3	.32	.43			
	35-60	15-35	30-58	27-35	1.85-2.05	0.01-0.6	0.00-0.04	3.0-5.9	0.0-0.1	.37	.43			
912A:														
Hoyleton------------	0-8	1-16	57-87	12-27	1.30-1.50	0.6-2	0.19-0.25	0.0-2.9	1.5-3.5	.37	.37	5	5	56
	8-11	1-16	57-81	18-27	1.30-1.50	0.2-0.6	0.16-0.22	0.0-2.9	0.3-0.8	.55	.55			
	11-39	1-10	45-64	35-45	1.30-1.50	0.06-0.6	0.11-0.17	6.0-8.9	0.2-0.5	.37	.37			
	39-80	6-40	25-75	19-35	1.40-1.60	0.2-0.6	0.15-0.18	0.0-5.9	0.0-0.3	.43	.49			
Darmstadt-----------	0-6	1-15	58-87	12-27	1.40-1.60	0.6-2	0.19-0.23	0.0-2.9	1.0-2.5	.43	.43	4	5	56
	6-14	1-15	58-87	12-27	1.40-1.60	0.2-0.6	0.18-0.22	0.0-2.9	0.3-0.8	.64	.64			
	14-20	2-15	45-67	30-42	1.30-1.50	0.06-0.6	0.14-0.18	3.0-5.9	0.2-0.5	.43	.49			
	20-40	2-15	52-72	25-35	1.35-1.55	0.02-0.06	0.14-0.18	3.0-5.9	0.1-0.3	.49	.49			
	40-60	10-25	42-68	20-35	1.40-1.60	0.02-0.2	0.14-0.18	0.0-2.9	0.0-0.3	.49	.49			
912B:														
Hoyleton------------	0-8	1-16	57-87	12-27	1.30-1.50	0.6-2	0.20-0.24	0.0-2.9	1.5-3.5	.37	.37	5	5	56
	8-15	1-16	57-81	18-27	1.30-1.50	0.2-0.6	0.17-0.21	0.0-2.9	0.3-0.8	.55	.55			
	15-34	1-10	45-64	35-45	1.30-1.50	0.06-0.6	0.12-0.16	6.0-8.9	0.2-0.5	.37	.37			
	34-60	6-40	25-75	19-35	1.40-1.60	0.2-0.6	0.15-0.18	0.0-5.9	0.0-0.3	.43	.49			
Darmstadt-----------	0-9	1-15	58-87	12-27	1.40-1.60	0.6-2	0.19-0.23	0.0-2.9	1.0-2.5	.43	.43	4	5	56
	9-13	1-15	58-87	12-27	1.40-1.60	0.2-0.6	0.18-0.22	0.0-2.9	0.3-0.8	.64	.64			
	13-21	2-15	45-67	30-42	1.30-1.50	0.06-0.6	0.14-0.18	3.0-5.9	0.2-0.5	.43	.49			
	21-27	2-15	52-72	25-35	1.35-1.55	0.02-0.06	0.14-0.18	3.0-5.9	0.1-0.3	.49	.49			
	27-60	10-25	42-68	20-35	1.40-1.60	0.02-0.2	0.11-0.15	3.0-5.9	0.0-0.3	.43	.43			
912B2:														
Hoyleton------------	0-7	1-16	57-87	12-27	1.30-1.50	0.6-2	0.20-0.24	0.0-2.9	1.0-2.5	.37	.37	5	6	48
	7-30	1-10	45-64	35-45	1.30-1.50	0.06-0.6	0.12-0.16	6.0-8.9	0.2-0.5	.32	.32			
	30-60	6-40	25-75	19-35	1.40-1.60	0.2-0.6	0.15-0.18	0.0-5.9	0.0-0.3	.43	.49			
Darmstadt-----------	0-7	1-15	58-87	12-27	1.40-1.60	0.6-2	0.19-0.23	0.0-2.9	1.0-2.5	.43	.43	3	6	48
	7-14	2-15	45-67	30-42	1.30-1.50	0.06-0.6	0.14-0.18	3.0-5.9	0.2-0.5	.43	.49			
	14-20	2-15	52-72	25-35	1.35-1.55	0.02-0.06	0.14-0.18	3.0-5.9	0.1-0.3	.49	.49			
	20-60	10-25	42-68	20-35	1.40-1.60	0.02-0.2	0.11-0.15	3.0-5.9	0.0-0.3	.43	.43			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	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
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
914C2:														
Atlas---------------	0-4	4-29	55-81	15-27	1.35-1.55	0.6-2	0.17-0.23	0.0-2.9	0.5-2.0	.43	.43	3	6	48
	4-34	15-35	30-45	35-42	1.45-1.65	0.06-0.2	0.10-0.16	3.0-5.9	0.2-0.5	.24	.24			
	34-68	20-45	30-50	25-35	1.50-1.75	0.06-0.6	0.09-0.15	3.0-5.9	0.0-0.3	.32	.37			
Grantfork-----------	0-6	4-29	50-80	15-25	1.35-1.55	0.6-2	0.17-0.23	0.0-2.9	0.5-2.0	.43	.43	3	5	56
	6-31	15-30	25-50	35-45	1.45-1.65	0.06-0.2	0.10-0.16	6.0-8.9	0.2-0.5	.24	.24			
	31-60	15-40	25-50	30-45	1.50-1.75	0.06-0.2	0.09-0.15	6.0-8.9	0.0-0.3	.32	.37			
929D2:														
Ava-----------------	0-5	2-14	70-82	15-22	1.30-1.50	0.6-2	0.18-0.24	0.0-2.9	0.5-2.0	.37	.37	4	6	48
	5-25	0-8	58-74	25-35	1.35-1.55	0.2-0.6	0.13-0.19	3.0-5.9	0.3-0.8	.37	.43			
	25-60	16-30	42-61	20-30	1.55-1.75	0.02-0.06	0.02-0.08	3.0-5.9	0.2-0.5	.43	.49			
Hickory-------------	0-10	10-30	50-78	12-25	1.40-1.60	0.6-2	0.13-0.19	0.0-2.9	0.5-2.0	.32	.32	5	6	48
	10-45	25-50	28-45	25-35	1.50-1.70	0.6-2	0.09-0.15	3.0-5.9	0.1-0.5	.24	.28			
	45-60	30-50	30-45	10-30	1.60-1.80	0.2-0.6	0.07-0.13	3.0-5.9	0.0-0.3	.28	.32			
947D2:														
Hickory-------------	0-10	10-30	50-78	12-25	1.40-1.60	0.6-2	0.13-0.19	0.0-2.9	0.5-2.0	.32	.32	5	6	48
	10-45	25-50	25-45	25-35	1.50-1.70	0.6-2	0.09-0.15	3.0-5.9	0.1-0.5	.24	.28			
	45-60	30-50	30-45	10-30	1.60-1.80	0.2-0.6	0.07-0.13	3.0-5.9	0.0-0.3	.32	.37			
Passport------------	0-4	10-35	50-75	12-25	1.40-1.60	0.2-0.6	0.17-0.23	0.0-2.9	1.0-2.5	.37	.37	5	5	56
	4-32	15-40	30-60	18-35	1.50-1.70	0.2-0.6	0.10-0.16	3.0-5.9	0.2-0.5	.32	.32			
	32-64	25-45	28-53	20-35	1.55-1.75	0.06-0.2	0.09-0.15	3.0-5.9	0.2-0.5	.37	.37			
947D3:														
Hickory-------------	0-10	20-40	25-53	27-35	1.45-1.65	0.6-2	0.09-0.15	3.0-5.9	0.3-1.0	.32	.32	4	6	48
	10-45	25-50	25-45	25-35	1.50-1.70	0.6-2	0.09-0.15	3.0-5.9	0.1-0.5	.24	.28			
	45-60	30-50	30-45	10-30	1.60-1.80	0.2-0.6	0.07-0.13	3.0-5.9	0.0-0.3	.32	.37			
Passport------------	0-4	20-40	25-53	27-35	1.45-1.65	0.6-2	0.10-0.16	3.0-5.9	0.3-1.0	.28	.28	4	6	48
	4-32	15-40	30-60	18-35	1.50-1.70	0.2-0.6	0.10-0.16	3.0-5.9	0.2-0.5	.32	.32			
	32-64	25-45	28-53	20-35	1.55-1.75	0.06-0.2	0.09-0.15	3.0-5.9	0.2-0.5	.37	.37			
967F:														
Hickory-------------	0-4	10-30	50-78	12-25	1.30-1.50	0.6-2	0.14-0.20	0.0-2.9	1.0-3.0	.32	.32	5	5	56
	4-12	15-45	33-70	15-22	1.30-1.50	0.6-2	0.14-0.20	0.0-2.9	0.1-0.8	.43	.43			
	12-46	15-45	30-50	24-35	1.45-1.65	0.6-2	0.10-0.16	3.0-5.9	0.1-0.5	.28	.32			
	46-58	25-49	28-50	15-32	1.50-1.70	0.2-2	0.10-0.16	0.0-2.9	0.1-0.5	.32	.37			
	58-80	30-55	25-50	15-30	1.50-1.75	0.2-0.6	0.09-0.15	0.0-2.9	0.1-0.5	.37	.37			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
967F:														
Gosport-------------	0-4	15-30	43-60	18-27	1.40-1.60	0.6-2	0.15-0.21	0.0-2.9	1.0-2.5	.32	.32	3	5	56
	4-7	15-30	43-60	18-27	1.40-1.60	0.2-0.6	0.13-0.19	0.0-2.9	0.1-0.5	.43	.49			
	7-32	1-9	47-59	38-45	1.30-1.50	0.06-0.2	0.09-0.15	6.0-8.9	0.1-0.4	.28	.37			
	32-60	0-20	40-60	40-55	1.40-1.80	0.02-0.06	0.04-0.10	0.0-2.9	0.0-0.1	.05	.32			
991A:														
Cisne---------------	0-8	1-10	70-83	10-20	1.30-1.50	0.6-2	0.19-0.25	0.0-2.9	1.5-3.5	.37	.37	3	5	56
	8-17	0-10	70-87	10-20	1.40-1.60	0.2-0.6	0.18-0.24	0.0-2.9	0.3-0.8	.64	.64			
	17-37	0-10	50-65	35-45	1.30-1.50	0.02-0.2	0.12-0.18	6.0-8.9	0.2-0.5	.43	.43			
	37-60	15-30	38-61	20-35	1.50-1.70	0.06-0.2	0.11-0.17	3.0-5.9	0.0-0.5	.43	.43			
	60-80	15-35	31-62	20-35	1.50-1.70	0.2-0.6	0.13-0.19	0.0-2.9	0.0-0.3	.43	.43			
Huey----------------	0-8	1-10	70-83	10-20	1.30-1.50	0.6-2	0.19-0.25	0.0-2.9	1.0-2.5	.43	.43	2	5	56
	8-10	0-10	70-87	10-20	1.40-1.60	0.2-0.6	0.18-0.24	0.0-2.9	0.3-0.8	.64	.64			
	10-18	1-8	59-71	25-35	1.30-1.50	0.06-0.6	0.13-0.19	3.0-5.9	0.2-0.5	.49	.49			
	18-49	1-8	59-71	25-42	1.30-1.50	0.02-0.06	0.13-0.19	3.0-5.9	0.0-0.3	.49	.49			
	49-65	15-35	31-62	20-35	1.50-1.70	0.02-0.6	0.13-0.19	0.0-2.9	0.0-0.3	.43	.43			
1524A:														
Zipp----------------	0-3	5-18	42-68	27-40	1.35-1.55	0.2-0.6	0.13-0.19	3.0-5.9	1.0-3.0	.28	.28	5	8	0
	3-60	1-12	33-64	35-55	1.50-1.70	0.06-0.2	0.05-0.11	6.0-8.9	0.5-1.8	.24	.24			
3072A:														
Sharon--------------	0-7	1-40	40-79	12-20	1.35-1.55	0.6-2	0.17-0.23	0.0-2.9	0.5-3.0	.43	.43	5	5	56
	7-25	1-30	52-79	5-18	1.40-1.60	0.6-2	0.16-0.22	0.0-2.9	0.2-1.0	.64	.64			
	25-61	1-30	52-79	5-18	1.40-1.60	0.6-2	0.16-0.22	0.0-2.9	0.2-0.5	.64	.64			
3108A:														
Bonnie--------------	0-10	1-32	50-80	18-27	1.30-1.50	0.6-2	0.22-0.25	0.0-2.9	1.0-3.0	.43	.43	5	6	48
	10-27	1-32	50-80	18-27	1.40-1.60	0.2-0.6	0.21-0.24	0.0-2.9	0.0-1.0	.49	.49			
	27-80	3-42	40-79	18-30	1.40-1.60	0.2-0.6	0.14-0.24	0.0-2.9	0.0-1.0	.49	.49			
3108T:														
Bonnie--------------	0-12	1-15	58-87	12-27	1.30-1.50	0.6-2	0.18-0.24	0.0-2.9	1.0-3.0	.43	.43	5	5	56
	12-23	1-15	58-81	18-27	1.35-1.55	0.2-0.6	0.17-0.23	0.0-2.9	0.2-0.8	.64	.64			
	23-64	1-15	58-81	18-27	1.35-1.55	0.06-0.2	0.15-0.21	0.0-2.9	0.2-0.5	.55	.55			
	64-80	1-15	50-72	27-35	1.40-1.60	0.06-0.2	0.12-0.18	3.0-5.9	0.1-0.3	.43	.43			
3225A:														
Holton--------------	0-9	15-40	50-72	7-18	1.20-1.60	0.6-2	0.17-0.23	0.0-2.9	1.0-3.0	.43	.43	5	5	56
	9-26	18-62	30-72	5-18	1.55-1.75	0.6-2	0.11-0.17	0.0-2.9	0.5-1.0	.43	.43			
	26-60	40-70	17-50	5-15	1.60-1.80	0.6-6	0.08-0.14	0.0-2.9	0.3-0.8	.32	.37			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	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
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
3226A:														
Wirt----------------	0-3	15-40	50-72	7-18	1.20-1.60	0.6-2	0.17-0.23	0.0-2.9	1.0-3.0	.43	.43	5	5	56
	3-32	18-62	30-72	5-18	1.55-1.75	0.6-2	0.11-0.17	0.0-2.9	0.5-1.0	.43	.43			
	32-60	20-80	10-72	5-18	1.55-1.75	0.6-6	0.11-0.17	0.0-2.9	0.3-0.8	.37	.37			
3333A:														
Wakeland------------	0-9	1-26	56-88	10-18	1.30-1.50	0.6-2	0.19-0.25	0.0-2.9	1.0-3.0	.43	.43	5	5	56
	9-60	1-26	56-88	10-18	1.30-1.50	0.6-2	0.17-0.23	0.0-2.9	0.3-1.0	.55	.55			
3334A:														
Birds---------------	0-6	2-24	55-80	15-25	1.30-1.50	0.6-2	0.19-0.25	0.0-2.9	1.0-3.0	.43	.43	5	5	56
	6-80	2-25	55-80	18-27	1.30-1.50	0.2-0.6	0.18-0.24	0.0-2.9	0.3-1.0	.49	.49			
3382A:														
Belknap-------------	0-13	0-15	65-88	12-20	1.30-1.50	0.6-2	0.19-0.25	0.0-2.9	1.0-3.0	.43	.43	5	5	56
	13-27	1-15	67-91	8-18	1.40-1.60	0.6-2	0.18-0.24	0.0-2.9	0.0-2.0	.64	.64			
	27-65	2-30	45-90	8-25	1.40-1.60	0.2-2	0.16-0.22	0.0-2.9	0.0-1.0	.55	.55			
3415A:														
Orion---------------	0-7	10-20	64-78	10-20	1.40-1.60	0.6-2	0.17-0.23	0.0-2.9	1.0-3.0	.43	.43	5	5	56
	7-24	10-40	45-75	10-18	1.50-1.70	0.6-2	0.16-0.22	0.0-2.9	0.5-2.0	.49	.49			
	24-42	10-35	50-75	10-25	1.40-1.60	0.6-2	0.16-0.22	0.0-2.9	1.0-2.5	.43	.43			
	42-60	10-40	45-75	10-18	1.50-1.70	0.6-2	0.15-0.21	0.0-2.9	0.3-1.0	.49	.49			
7337B:														
Creal---------------	0-6	1-10	63-81	18-27	1.30-1.50	0.2-0.6	0.18-0.24	0.0-2.9	1.0-2.5	.43	.43	5	6	48
	6-27	1-15	60-81	18-25	1.40-1.60	0.2-0.6	0.17-0.23	0.0-2.9	0.3-0.8	.55	.55			
	27-44	1-12	53-74	25-35	1.40-1.60	0.2-0.6	0.12-0.18	3.0-5.9	0.2-0.5	.43	.43			
	44-60	1-20	50-79	20-30	1.40-1.60	0.2-0.6	0.14-0.20	0.0-2.9	0.0-0.2	.55	.55			
8787A:														
Banlic--------------	0-9	1-15	67-86	12-18	1.40-1.60	0.2-0.6	0.16-0.22	0.0-2.9	1.0-2.5	.43	.43	5	5	56
	9-30	1-15	67-86	12-18	1.40-1.60	0.2-0.6	0.16-0.22	0.0-2.9	0.2-0.8	.55	.55			
	30-50	1-15	67-86	10-18	1.40-1.60	0.06-0.2	0.05-0.11	0.0-2.9	0.2-0.5	.64	.64			
	50-60	5-15	67-81	12-18	1.40-1.60	0.2-0.6	0.16-0.22	0.0-2.9	0.0-0.3	.64	.64			

Table 20.--Chemical Properties of the Soils

(Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction	Calcium carbon-ate	Organic matter	Sodium adsorp-tion ratio
	In	meq/100 g	meq/100 g	pH	Pct	Pct	
2A:							
Cisne----------------	0-8	9.2-17	---	5.1-7.3	0	1.5-3.5	0-3
	8-17	8.8-16	---	5.1-6.5	0	0.3-0.8	0-3
	17-37	25-33	18-29	4.5-6.0	0	0.2-0.5	0-5
	37-60	14-26	---	5.1-6.5	0	0.0-0.5	0-5
	60-80	14-26	---	5.6-7.3	0	0.0-0.3	1-13
3A:							
Hoyleton-------------	0-8	11-22	---	4.5-7.3	0	1.5-3.5	0-3
	8-11	15-21	---	4.5-7.3	0	0.3-0.8	0-3
	11-39	25-33	18-27	4.5-5.5	0	0.2-0.5	0-5
	39-80	14-26	---	5.6-7.3	0	0.0-0.3	1-13
3B:							
Hoyleton-------------	0-8	11-22	---	4.5-7.3	0	1.5-3.5	0-3
	8-15	15-21	9.3-18	4.5-6.0	0	0.3-0.8	0-3
	15-34	25-33	18-27	4.5-5.5	0	0.2-0.5	0-5
	34-60	14-26	---	5.1-6.5	0	0.0-0.3	1-13
3B2:							
Hoyleton-------------	0-7	11-22	---	4.5-7.3	0	1.0-2.5	0-3
	7-30	25-33	18-27	4.5-5.5	0	0.2-0.5	0-5
	30-60	14-26	---	5.1-6.5	0	0.0-0.3	1-13
4B:							
Richview-------------	0-8	12-25	---	5.1-7.3	0	1.5-3.5	0
	8-12	12-20	7.9-13	5.1-7.3	0	0.3-0.8	0
	12-38	19-27	12-18	4.5-6.5	0	0.2-0.5	0-3
	38-46	11-25	---	4.5-6.5	0	0.1-0.3	0-3
	46-60	3.0-17	---	6.1-7.3	0	0.0-0.3	0-5
4C2:							
Richview-------------	0-7	12-25	---	5.1-7.3	0	1.0-2.5	0
	7-12	10-23	---	5.1-7.3	0	0.3-0.8	0
	12-40	19-27	12-18	4.5-6.5	0	0.2-0.5	0-3
	40-60	14-23	9.0-15	4.5-6.5	0	0.1-0.3	0-3
	60-80	3.0-17	---	6.1-7.3	0	0.0-0.3	0-5
5C3:							
Blair----------------	0-4	21-24	---	4.5-7.3	0	0.3-1.0	0-3
	4-20	20-27	13-18	4.5-6.0	0	0.2-0.5	0-3
	20-60	14-26	---	5.1-7.8	0	0.0-0.2	0-5
7C2:							
Atlas----------------	0-4	13-22	---	4.5-7.3	0	0.5-2.0	0-3
	4-34	25-31	18-33	4.5-7.3	0	0.2-0.5	0-3
	34-68	17-26	---	6.1-7.8	0	0.0-0.3	0-5
7C3:							
Atlas----------------	0-2	21-25	---	4.5-7.3	0	0.3-1.0	0-3
	2-24	25-31	18-33	4.5-7.3	0	0.2-0.5	0-3
	24-68	23-30	---	6.1-7.8	0	0.0-0.3	0-5
7D2:							
Atlas----------------	0-6	13-23	---	4.5-7.3	0	0.5-2.0	0-3
	6-50	25-31	18-33	4.5-7.3	0	0.2-0.5	0-3
	50-65	17-26	---	6.1-7.8	0	0.0-0.3	0-5

Table 20.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction	Calcium carbon-ate	Organic matter	Sodium adsorp-tion ratio
	In	meq/100 g	meq/100 g	pH	Pct	Pct	
7D3:							
Atlas----------------	0-5	21-25	---	4.5-7.3	0	0.3-1.0	0-3
	5-37	25-31	18-33	4.5-7.3	0	0.2-0.5	0-3
	37-60	24-30	---	6.1-7.8	0	0.0-0.3	0-5
8D3:							
Hickory--------------	0-8	10-20	8.0-15	4.5-7.3	0	0.5-1.0	0-2
	8-46	10-19	8.0-14	4.5-6.0	0	0.1-0.5	0-2
	46-58	10-19	8.0-14	4.5-7.3	0	0.0-0.2	0-2
	58-80	8.0-15	---	5.6-8.4	0-10	0.0-0.2	0-2
8F:							
Hickory--------------	0-4	6.5-14	---	4.5-7.3	0	1.0-3.0	0-3
	4-12	7.8-12	---	4.5-7.3	0	0.1-0.5	0-3
	12-46	12-18	---	4.5-6.0	0	0.1-0.5	0-3
	46-58	7.8-17	---	5.1-7.3	0	0.1-0.5	0-3
	58-80	7.8-16	---	5.6-8.4	0-25	0.1-0.5	0-5
8G:							
Hickory--------------	0-5	6.5-11	---	5.1-6.0	0	1.0-3.0	0-3
	5-8	6.4-11	3.2-6.4	4.5-6.0	0	0.5-1.5	0-3
	8-52	13-18	8.3-15	4.5-6.5	0	0.1-0.5	0-3
	52-60	5.1-14	---	5.6-8.4	0-25	0.0-0.3	0-5
10C:							
Plumfield------------	0-5	14-19	8.4-13	4.5-7.3	0	0.3-1.0	0-3
	5-12	10-16	6.4-11	4.5-6.5	0	0.2-0.5	0-3
	12-36	10-16	6.8-12	4.5-5.5	0	0.1-0.3	0-5
	36-70	10-18	---	4.5-6.0	0	0.0-0.2	0-5
12A:							
Wynoose--------------	0-7	9.1-17	---	5.1-7.3	0	1.0-2.5	0-3
	7-20	8.8-16	4.2-14	3.5-6.0	0	0.3-0.8	0-3
	20-36	25-31	14-28	3.5-6.0	0	0.2-0.5	0-5
	36-66	18-26	10-23	3.5-6.0	0	0.0-0.3	0-5
	66-80	18-26	---	5.6-7.3	0	0.0-0.3	1-13
13A:							
Bluford--------------	0-7	9.1-16	---	5.6-7.3	0	1.0-2.5	0-3
	7-20	12-20	7.8-17	4.5-6.0	0	0.2-0.8	0-3
	20-35	25-33	18-29	4.5-6.0	0	0.2-0.5	0-5
	35-60	14-26	10-23	4.5-6.0	0	0.0-0.3	1-13
13B:							
Bluford--------------	0-7	9.1-16	---	5.6-7.3	0	1.0-2.5	0-3
	7-20	12-20	7.8-17	4.5-6.0	0	0.2-1.5	0-3
	20-35	25-33	18-29	4.5-6.0	0	0.2-0.5	0-5
	35-60	14-26	10-23	4.5-6.0	0	0.0-0.3	1-13
13B2:							
Bluford--------------	0-9	13-18	---	4.5-7.3	0	0.5-2.0	0-3
	9-37	25-31	18-29	4.5-6.5	0	0.2-0.5	0-5
	37-60	14-23	---	4.5-6.0	0	0.0-0.3	1-13
14B:							
Ava------------------	0-6	6.5-11	---	5.1-7.3	0	1.0-2.5	0
	6-14	6.4-11	3.4-6.8	4.5-5.5	0	0.3-0.8	0
	14-34	13-18	8.3-14	4.5-5.5	0	0.2-0.5	0-3
	34-50	10-16	6.8-15	4.5-5.5	0	0.0-0.3	0-3
	50-60	10-16	6.8-15	4.5-6.0	0	0.0-0.3	0-5

Table 20.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction	Calcium carbon-ate	Organic matter	Sodium adsorp-tion ratio
	In	meq/100 g	meq/100 g	pH	Pct	Pct	
14C2:							
Ava------------------	0-7	8.0-12	---	5.1-7.3	0	0.5-2.0	0
	7-31	13-19	7.9-14	4.5-5.5	0	0.3-0.8	0-3
	31-50	10-16	6.4-12	4.5-5.5	0	0.2-0.5	0-3
	50-60	10-16	---	4.5-6.0	0	0.0-0.3	0-5
15B2:							
Parke----------------	0-7	10-20	---	5.1-6.5	0	0.5-2.0	0
	7-19	9.4-16	---	4.5-6.5	0	0.2-0.5	0
	19-38	9.4-14	5.7-10	4.5-6.0	0	0.2-0.5	0
	38-68	5.1-16	2.9-15	4.5-5.5	0	0.0-0.5	0
109A:							
Racoon---------------	0-6	12-21	---	4.5-7.3	0	1.0-2.5	0-3
	6-30	12-20	7.9-13	4.5-7.3	0	0.3-0.8	0-3
	30-59	20-27	13-18	4.5-5.5	0	0.2-0.5	0-5
	59-73	13-20	---	5.6-7.3	0	0.0-0.2	1-13
120A:							
Huey-----------------	0-8	8.9-17	---	5.1-7.3	0	1.0-2.5	0-5
	8-10	8.5-16	---	5.6-7.3	0	0.3-0.8	0-5
	10-15	19-27	---	6.1-8.4	0-10	0.2-0.5	0-13
	15-49	17-26	---	7.4-9.0	0-10	0.0-0.3	13-30
	49-65	14-26	---	6.6-8.4	0-10	0.0-0.3	4-20
218A:							
Newberry-------------	0-9	11-17	---	5.6-7.3	0	1.5-3.5	0-3
	9-16	10.0-16	---	4.5-6.0	0	0.3-0.8	0-3
	16-35	19-27	12-18	4.5-6.0	0	0.2-0.5	0-13
	35-48	17-27	11-18	4.5-6.0	0	0.0-0.5	3-13
	48-80	23-30	---	5.6-7.3	0-5	0.0-0.3	3-13
421G:							
Kell-----------------	0-3	6.5-9.8	---	5.1-6.0	0	1.0-2.5	0
	3-13	9.3-14	---	4.5-6.0	0	0.1-0.5	0
	13-25	14-18	11-12	3.5-6.0	0	0.1-0.5	0
	25-35	14-18	4.0-13	3.5-6.0	0	0.0-0.3	0
	35-60	14-18	4.0-15	3.5-6.0	0	0.0-0.1	0
533.							
Urban land							
551D2:							
Gosport--------------	0-3	11-18	---	6.1-7.3	0	1.0-2.5	0
	3-34	18-37	2.0-7.7	3.5-5.5	0	0.1-0.4	0
	34-60	13-28	---	4.5-6.5	0	0.0-0.1	0
551F:							
Gosport--------------	0-4	9.3-14	---	6.1-7.3	0	1.0-2.5	0
	4-7	11-28	1.9-7.0	3.5-5.5	0	0.1-0.5	0
	7-32	18-37	2.9-7.9	3.5-5.5	0	0.1-0.4	0
	32-60	13-28	1.7-6.4	4.5-6.5	0	0.0-0.1	0
551G:							
Gosport--------------	0-4	11-22	5.2-17	5.1-7.3	0	1.0-2.5	0
	4-34	18-37	2.9-7.9	3.5-5.5	0	0.1-0.4	0
	34-60	13-28	1.7-6.4	4.5-6.5	0	0.0-0.1	0

Table 20.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction	Calcium carbon-ate	Organic matter	Sodium adsorp-tion ratio
	In	meq/100 g	meq/100 g	pH	Pct	Pct	
581A:							
Tamalco--------------	0-8	10-22	---	4.5-7.3	0	0.5-2.0	0-5
	8-13	10-21	---	4.5-7.3	0	0.3-0.8	0-5
	13-25	26-32	---	5.1-7.3	0	0.2-0.5	0-13
	25-41	20-26	---	6.6-8.4	0-15	0.1-0.3	13-25
	41-70	11-23	---	7.4-9.0	0-25	0.0-0.3	4-20
652C2:							
Passport-------------	0-4	6.5-14	---	5.1-7.3	0	1.0-2.5	0-3
	4-38	9.4-18	---	4.5-7.3	0	0.2-0.5	0-3
	38-78	10-18	---	5.1-7.3	0	0.2-0.5	0-5
	78-80	7.6-16	---	6.6-8.4	0	0.0-0.3	0-5
652D2:							
Passport-------------	0-4	6.5-14	---	5.1-7.3	0	1.0-2.5	0-3
	4-32	9.4-18	---	4.5-7.3	0	0.2-0.5	0-5
	32-64	10-18	---	5.1-7.3	0	0.2-0.5	0-5
801B:							
Orthents-------------	0-80	10-25	8.0-19	5.1-7.8	0-10	0.2-1.0	0
810.							
Oil-waste land							
888C2:							
Passport-------------	0-4	6.5-14	---	5.1-7.3	0	1.0-2.5	0-3
	4-38	9.4-18	---	4.5-7.3	0	0.2-0.5	0-3
	38-78	10-18	---	5.1-7.3	0	0.2-0.5	0-5
	78-80	7.6-16	---	6.6-8.4	0	0.0-0.3	0-5
Grantfork------------	0-4	6.4-14	3.1-8.3	4.5-7.3	0	0.5-2.0	0-3
	4-9	6.4-13	3.4-8.8	5.1-7.3	0	0.3-0.8	0-5
	9-30	9.4-18	---	5.6-7.8	0	0.2-0.5	5-13
	30-60	10-18	---	7.4-9.0	0-5	0.2-0.5	4-20
908D2:							
Hickory--------------	0-10	5.4-11	---	4.5-7.3	0	1.0-2.5	0-3
	10-45	13-18	10-12	4.5-6.5	0	0.1-0.5	0-3
	45-60	5.1-16	---	5.6-8.4	0-15	0.0-0.3	0-5
Kell-----------------	0-4	6.5-9.8	---	5.1-6.0	0	1.0-2.5	0
	4-17	9.3-14	6.9-9.1	4.5-6.0	0	0.1-0.5	0
	17-38	14-18	11-12	3.5-6.0	0	0.1-0.5	0
	38-80	0.0-2.6	0.0-1.6	3.5-6.0	0	0.0-0.1	0
908F:							
Hickory--------------	0-4	5.4-11	2.7-5.2	4.5-6.0	0	1.0-3.0	0-3
	4-12	5.2-11	3.5-6.4	4.5-6.0	0	0.1-0.5	0-3
	12-46	13-18	10-12	4.5-6.5	0	0.1-0.5	0-3
	46-58	5.2-15	---	4.5-7.3	0	0.1-0.3	0-3
	58-80	5.1-14	---	5.6-8.4	0-25	0.0-0.3	0-5
Kell-----------------	0-3	6.5-9.8	---	5.1-6.0	0	1.0-2.5	0
	3-13	9.3-14	---	4.5-6.0	0	0.1-0.5	0
	13-25	---	11-12	3.5-6.0	0	0.1-0.5	0
	25-35	---	4.0-13	3.5-6.0	0	0.0-0.3	0
	35-60	---	4.0-15	3.5-6.0	0	0.0-0.1	0

Table 20.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction	Calcium carbon-ate	Organic matter	Sodium adsorp-tion ratio
	In	meq/100 g	meq/100 g	pH	Pct	Pct	
912A:							
Hoyleton-------------	0-8	11-22	---	4.5-7.3	0	1.5-3.5	0-3
	8-11	14-21	---	4.5-7.3	0	0.3-0.8	0-3
	11-39	25-32	18-27	4.5-5.5	0	0.2-0.5	0-5
	39-80	14-26	---	5.6-7.3	0	0.0-0.3	1-13
Darmstadt------------	0-6	10-22	---	4.5-7.3	0	1.0-2.5	0-5
	6-14	9.8-21	---	5.1-7.3	0	0.3-0.8	0-5
	14-20	22-32	---	5.1-7.8	0-5	0.2-0.5	0-13
	20-40	19-26	---	6.6-9.0	0-15	0.1-0.3	13-25
	40-60	14-26	---	7.4-9.0	0-25	0.0-0.3	4-20
912B:							
Hoyleton-------------	0-8	11-22	---	4.5-7.3	0	1.5-3.5	0-3
	8-15	15-21	9.3-18	4.5-6.0	0	0.3-0.8	0-3
	15-34	25-33	18-27	4.5-5.5	0	0.2-0.5	0-5
	34-60	14-26	---	5.1-6.5	0	0.0-0.3	1-13
Darmstadt------------	0-9	10-22	---	4.5-7.3	0	1.0-2.5	0-5
	9-13	9.8-21	---	5.1-7.3	0	0.3-0.8	0-5
	13-21	22-32	---	5.1-7.8	0-5	0.2-0.5	0-13
	21-27	18-26	---	6.6-9.0	0-15	0.1-0.3	13-25
	27-60	14-26	---	7.4-9.0	0-25	0.0-0.3	4-20
912B2:							
Hoyleton-------------	0-7	11-22	---	4.5-7.3	0	1.0-2.5	0-3
	7-30	25-33	18-27	4.5-5.5	0	0.2-0.5	0-5
	30-60	14-26	---	5.1-6.5	0	0.0-0.3	1-13
Darmstadt------------	0-7	10-22	---	4.5-7.3	0	1.0-2.5	0-5
	7-14	22-32	---	5.1-7.8	0-5	0.2-0.5	0-13
	14-20	18-26	---	6.6-9.0	0-15	0.1-0.3	13-25
	20-60	14-26	---	7.4-9.0	0-25	0.0-0.3	4-20
914C2:							
Atlas----------------	0-4	13-22	---	4.5-7.3	0	0.5-2.0	0-3
	4-34	25-31	18-33	4.5-7.3	0	0.2-0.5	0-3
	34-68	17-26	---	6.1-7.8	0	0.0-0.3	0-5
Grantfork------------	0-6	12-21	---	4.5-7.3	0	0.5-2.0	0-5
	6-31	26-34	---	4.5-7.8	0	0.2-0.5	5-13
	31-60	20-33	---	6.6-8.4	0-5	0.0-0.3	4-20
929D2:							
Ava------------------	0-5	8.0-12	---	5.1-7.3	0	0.5-2.0	0-3
	5-25	13-19	7.9-14	4.5-5.5	0	0.3-0.8	0-3
	25-60	10-16	6.4-12	4.5-5.5	0	0.2-0.5	0-5
Hickory--------------	0-10	6.5-14	---	4.5-7.3	0	0.5-2.0	0-3
	10-45	13-18	8.3-15	4.5-6.5	0	0.1-0.5	0-3
	45-60	5.1-16	---	5.6-8.4	0-15	0.0-0.3	0-5
947D2:							
Hickory--------------	0-10	6.5-14	---	4.5-7.3	0	0.5-2.0	0-3
	10-45	13-18	8.3-15	4.5-6.5	0	0.1-0.5	0-3
	45-60	5.1-16	---	5.6-8.4	0-15	0.0-0.3	0-5
Passport-------------	0-4	6.5-14	---	5.1-7.3	0	1.0-2.5	0-3
	4-32	9.4-18	---	4.5-7.3	0	0.2-0.5	0-5
	32-64	10-18	---	5.1-7.3	0	0.2-0.5	0-5

Table 20.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction	Calcium carbon-ate	Organic matter	Sodium adsorp-tion ratio
	In	meq/100 g	meq/100 g	pH	Pct	Pct	
947D3:							
Hickory	0-10	15-20	---	4.5-7.3	0	0.3-1.0	0-3
	10-45	13-18	8.3-15	4.5-6.5	0	0.1-0.5	0-3
	45-60	5.1-16	---	5.6-8.4	0-15	0.0-0.3	0-5
Passport	0-4	14-19	---	5.1-7.3	0	0.3-1.0	0-3
	4-32	9.4-18	---	4.5-7.3	0	0.2-0.5	0-5
	32-64	10-18	---	5.1-7.3	0	0.2-0.5	0-5
967F:							
Hickory	0-4	6.5-14	---	4.5-7.3	0	1.0-3.0	0-3
	4-12	7.8-12	---	4.5-7.3	0	0.1-0.8	0-3
	12-46	12-18	---	4.5-6.0	0	0.1-0.5	0-3
	46-58	7.8-17	---	5.1-7.3	0	0.1-0.5	0-3
	58-80	7.8-16	---	5.6-8.4	0-25	0.1-0.5	0-5
Gosport	0-4	9.3-14	---	6.1-7.3	0	1.0-2.5	0
	4-7	11-28	1.9-7.0	3.5-5.5	0	0.1-0.5	0
	7-32	18-37	2.9-7.9	3.5-5.5	0	0.1-0.4	0
	32-60	13-28	1.7-6.4	4.5-6.5	0	0.0-0.1	0
991A:							
Cisne	0-8	9.2-17	---	5.1-7.3	0	1.5-3.5	0-3
	8-17	8.8-16	---	5.1-6.5	0	0.3-0.8	0-3
	17-37	25-32	18-29	4.5-6.0	0	0.2-0.5	0-5
	37-60	14-26	---	5.1-6.5	0	0.0-0.5	0-5
	60-80	14-26	---	5.6-7.3	0	0.0-0.3	1-13
Huey	0-8	8.9-17	---	5.1-7.3	0	1.0-2.5	0-5
	8-10	8.5-16	---	5.6-7.3	0	0.3-0.8	0-5
	10-18	19-27	---	6.1-8.4	0-10	0.2-0.5	0-13
	18-49	17-31	---	7.4-9.0	0-10	0.0-0.3	13-30
	49-65	14-26	---	6.6-8.4	0-10	0.0-0.3	4-20
1524A:							
Zipp	0-3	14-22	---	5.6-7.3	0	1.0-3.0	0-3
	3-60	18-29	---	5.6-7.3	0	0.5-1.8	0-3
3072A:							
Sharon	0-7	6.4-11	2.9-6.4	4.5-7.3	0	0.5-3.0	0-3
	7-25	2.7-9.7	1.2-6.3	4.5-7.3	0	0.2-1.0	0-3
	25-61	2.7-9.6	1.3-6.3	4.5-7.3	0	0.2-0.5	1-13
3108A:							
Bonnie	0-10	13-20	10-15	4.5-7.3	0	1.0-3.0	0
	10-27	---	8.0-13	4.5-5.5	0	0.0-1.0	0
	27-80	11-16	8.0-13	4.5-7.8	0	0.0-1.0	0
3108T:							
Bonnie	0-12	10-23	---	5.6-7.3	0	1.0-3.0	0-3
	12-23	14-22	---	5.1-7.0	0	0.2-0.8	1-13
	23-64	14-21	9.2-14	4.5-6.0	0	0.2-0.5	6-13
	64-80	20-26	---	5.6-7.3	0	0.1-0.3	13-30
3225A:							
Holton	0-9	3.8-9.8	---	6.1-7.3	0	1.0-3.0	0-3
	9-26	2.7-9.7	---	5.6-7.8	0	0.5-1.0	0-3
	26-60	2.7-8.0	---	5.6-7.8	0	0.3-0.8	0-3

Table 20.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction	Calcium carbon-ate	Organic matter	Sodium adsorp-tion ratio
	In	meq/100 g	meq/100 g	pH	Pct	Pct	
3226A:							
Wirt	0-3	6.4-16	---	5.6-7.3	0	1.0-3.0	0
	3-32	4.6-15	---	5.6-7.3	0	0.5-1.0	0
	32-60	4.6-15	---	5.6-7.3	0	0.3-0.8	0
3333A:							
Wakeland	0-9	8.9-16	---	5.6-7.3	0	1.0-3.0	0
	9-60	8.5-15	---	5.6-7.8	0	0.3-1.0	0
3334A:							
Birds	0-6	13-21	---	5.6-7.3	0	1.0-3.0	0
	6-80	14-22	---	5.6-7.8	0	0.3-1.0	0
3382A:							
Belknap	0-13	4.3-9.8	1.8-5.3	4.5-7.3	0	1.0-3.0	0-3
	13-27	4.1-9.8	1.9-5.3	4.5-5.5	0	0.0-2.0	0-3
	27-65	4.1-13	---	4.5-6.0	0	0.0-1.0	1-13
3415A:							
Orion	0-7	8.9-17	---	5.6-7.3	0	1.0-3.0	0
	7-24	8.6-16	---	5.6-7.3	0	0.5-2.0	0
	24-42	8.9-21	---	5.6-7.3	0	1.0-2.5	0-3
	42-60	8.5-15	---	5.6-7.3	0	0.3-1.0	0-3
7337B:							
Creal	0-6	15-22	---	5.1-7.3	0	1.0-2.5	0-3
	6-27	14-20	---	4.5-6.0	0	0.3-0.8	0-3
	27-44	19-27	14-18	4.5-6.5	0	0.2-0.5	0-3
	44-60	14-23	---	4.5-7.3	0	0.0-0.2	0-3
8787A:							
Banlic	0-9	6.5-9.8	---	5.6-7.3	0	1.0-2.5	0-3
	9-30	6.3-9.6	---	4.5-6.5	0	0.2-0.8	0-3
	30-50	5.3-9.6	2.9-6.3	4.5-5.5	0	0.2-0.5	0-5
	50-60	6.1-9.5	---	4.5-6.5	0	0.0-0.3	1-13

Table 21.--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	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency	Months	Water table: Upper limit	Water table: Lower limit	Water table: Kind
		Ft						Ft	Ft	
2A:										
Cisne	D	0.0-0.5	Brief	Frequent	---	None	Jan-May	0.0-1.0	>6.0	Apparent
		---	---	None	---	None	Jun-Dec	>6.0	>6.0	---
3A:										
Hoyleton	C	---	---	None	---	None	Jan-May	1.0-2.0	>6.0	Apparent
		---	---	None	---	None	Jun-Dec	>6.0	>6.0	---
3B:										
Hoyleton	C	---	---	None	---	None	Jan-May	1.0-2.0	>6.0	Apparent
		---	---	None	---	None	Jun-Dec	>6.0	>6.0	---
3B2:										
Hoyleton	C	---	---	None	---	None	Jan-May	1.0-2.0	>6.0	Apparent
		---	---	None	---	None	Jun-Dec	>6.0	>6.0	---
4B:										
Richview	C	---	---	None	---	None	Jan	>6.0	>6.0	---
		---	---	None	---	None	Feb-Apr	1.5-4.0	>6.0	Apparent
		---	---	None	---	None	May-Dec	>6.0	>6.0	---
4C2:										
Richview	C	---	---	None	---	None	Jan	>6.0	>6.0	---
		---	---	None	---	None	Feb-Apr	1.5-4.0	>6.0	Apparent
		---	---	None	---	None	May-Dec	>6.0	>6.0	---
5C3:										
Blair	C	---	---	None	---	None	Jan-May	1.0-2.0	>6.0	Apparent
		---	---	None	---	None	Jun-Dec	>6.0	>6.0	---
7C2:										
Atlas	D	---	---	None	---	None	Jan-May	1.0-2.0	>6.0	Apparent
		---	---	None	---	None	Jun-Dec	>6.0	>6.0	---
7C3:										
Atlas	D	---	---	None	---	None	Jan-May	0.5-2.0	>6.0	Apparent
		---	---	None	---	None	Jun-Dec	>6.0	>6.0	---
7D2:										
Atlas	D	---	---	None	---	None	Jan-May	1.0-2.0	>6.0	Apparent
		---	---	None	---	None	Jun-Dec	>6.0	>6.0	---
7D3:										
Atlas	D	---	---	None	---	None	Jan-May	0.5-2.0	>6.0	Apparent
		---	---	None	---	None	Jun-Dec	>6.0	>6.0	---
8D3:										
Hickory	C	---	---	None	---	None	Jan-Dec	>6.0	>6.0	---
8F:										
Hickory	B	---	---	None	---	None	Jan-Dec	>6.0	>6.0	---
8G:										
Hickory	B	---	---	None	---	None	Jan-Dec	>6.0	>6.0	---

Table 21.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency	Months	Water table: Upper limit	Water table: Lower limit	Water table: Kind
		Ft						Ft	Ft	
10C:										
Plumfield	C	---	---	None	---	None	Jan	>6.0	>6.0	---
		---	---	None	---	None	Feb-Apr	1.5-3.5	2.6-5.1	Perched
		---	---	None	---	None	May-Dec	>6.0	>6.0	---
12A:										
Wynoose	D	0.0-0.5	Brief	Frequent	---	None	Jan-May	0.0-1.0	>6.0	Apparent
		---	---	None	---	None	Jun-Dec	>6.0	>6.0	---
13A:										
Bluford	C	---	---	None	---	None	Jan-May	0.5-2.0	2.5-4.6	Perched
		---	---	None	---	None	Jun-Dec	>6.0	>6.0	---
13B:										
Bluford	C	---	---	None	---	None	Jan-May	0.5-2.0	2.5-4.6	Perched
		---	---	None	---	None	Jun-Dec	>6.0	>6.0	---
13B2:										
Bluford	C	---	---	None	---	None	Jan-May	0.5-2.0	2.5-4.6	Perched
		---	---	None	---	None	Jun-Dec	>6.0	>6.0	---
14B:										
Ava	C	---	---	None	---	None	Jan	>6.0	>6.0	---
		---	---	None	---	None	Feb-Apr	1.5-2.9	2.1-3.3	Perched
		---	---	None	---	None	May-Dec	>6.0	>6.0	---
14C2:										
Ava	C	---	---	None	---	None	Jan	>6.0	>6.0	---
		---	---	None	---	None	Feb-Apr	1.5-2.9	2.1-3.3	Perched
		---	---	None	---	None	May-Dec	>6.0	>6.0	---
15B2:										
Parke	B	---	---	None	---	None	Jan-Dec	>6.0	>6.0	---
109A:										
Racoon	C/D	0.0-0.5	Brief	Frequent	---	None	Jan-May	0.0-1.0	>6.0	Apparent
		---	---	None	---	None	Jun-Dec	>6.0	>6.0	---
120A:										
Huey	D	0.0-0.5	Brief	Frequent	---	None	Jan-May	0.0-1.0	>6.0	Apparent
		---	---	None	---	None	Jun-Dec	>6.0	>6.0	---
218A:										
Newberry	C	0.0-0.5	Brief	Frequent	---	None	Jan-May	0.0-1.0	>6.0	Apparent
		---	---	None	---	None	Jun-Dec	>6.0	>6.0	---
421G:										
Kell	B	---	---	None	---	None	Jan-Dec	>6.0	>6.0	---
533:										
Urban land	D	---	---	None	---	None	Jan-Dec	>6.0	>6.0	---
551D2:										
Gosport	C	---	---	None	---	None	Jan	>6.0	>6.0	---
		---	---	None	---	None	Feb-Apr	1.5-4.0	>6.0	Apparent
		---	---	None	---	None	May-Dec	>6.0	>6.0	---
551F:										
Gosport	C	---	---	None	---	None	Jan	>6.0	>6.0	---
		---	---	None	---	None	Feb-Apr	1.5-4.0	>6.0	Apparent
		---	---	None	---	None	May-Dec	>6.0	>6.0	---

Table 21.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency	Months	Water table: Upper limit	Water table: Lower limit	Water table: Kind
		Ft						Ft	Ft	
551G:										
Gosport---------------	C	---	---	None	---	None	Jan	>6.0	>6.0	---
		---	---	None	---	None	Feb-Apr	1.5-4.0	>6.0	Apparent
		---	---	None	---	None	May-Dec	>6.0	>6.0	---
581A:										
Tamalco---------------	D	---	---	None	---	None	Jan	>6.0	>6.0	---
		---	---	None	---	None	Feb-Apr	1.5-4.0	>6.0	Apparent
		---	---	None	---	None	May-Dec	>6.0	>6.0	---
652C2:										
Passport--------------	C	---	---	None	---	None	Jan-May	1.0-2.0	>6.0	Apparent
		---	---	None	---	None	Jun-Dec	>6.0	>6.0	---
652D2:										
Passport--------------	C	---	---	None	---	None	Jan-May	1.0-2.0	>6.0	Apparent
		---	---	None	---	None	Jun-Dec	>6.0	>6.0	---
801B:										
Orthents--------------	B	---	---	---	---	---	---	>6.0	>6.0	---
810.										
Oil-waste land										
888C2:										
Passport--------------	C	---	---	None	---	None	Jan-May	1.0-2.0	>6.0	Apparent
		---	---	None	---	None	Jun-Dec	>6.0	>6.0	---
Grantfork-------------	D	---	---	None	---	None	Jan-May	1.0-2.0	>6.0	Apparent
		---	---	None	---	None	Jun-Dec	>6.0	>6.0	---
908D2:										
Hickory---------------	B	---	---	None	---	None	Jan-Dec	>6.0	>6.0	---
Kell------------------	B	---	---	None	---	None	Jan-Dec	>6.0	>6.0	---
908F:										
Hickory---------------	B	---	---	None	---	None	Jan-Dec	>6.0	>6.0	---
Kell------------------	B	---	---	None	---	None	Jan-Dec	>6.0	>6.0	---
912A:										
Hoyleton--------------	C	---	---	None	---	None	Jan-May	1.0-2.0	>6.0	Apparent
		---	---	None	---	None	Jun-Dec	>6.0	>6.0	---
Darmstadt-------------	D	---	---	None	---	None	Jan-May	1.0-2.0	>6.0	Apparent
		---	---	None	---	None	Jun-Dec	>6.0	>6.0	---
912B:										
Hoyleton--------------	C	---	---	None	---	None	Jan-May	1.0-2.0	>6.0	Apparent
		---	---	None	---	None	Jun-Dec	>6.0	>6.0	---
Darmstadt-------------	D	---	---	None	---	None	Jan-May	1.0-2.0	>6.0	Apparent
		---	---	None	---	None	Jun-Dec	>6.0	>6.0	---
912B2:										
Hoyleton--------------	C	---	---	None	---	None	Jan-May	1.0-2.0	>6.0	Apparent
		---	---	None	---	None	Jun-Dec	>6.0	>6.0	---
Darmstadt-------------	D	---	---	None	---	None	Jan-May	1.0-2.0	>6.0	Apparent
		---	---	None	---	None	Jun-Dec	>6.0	>6.0	---

Table 21.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency	Months	Water table: Upper limit	Water table: Lower limit	Water table: Kind
		Ft						Ft	Ft	
914C2:										
Atlas	D	---	---	None	---	None	Jan-May	1.0-2.0	>6.0	Apparent
		---	---	None	---	None	Jun-Dec	>6.0	>6.0	---
Grantfork	D	---	---	None	---	None	Jan-May	1.0-2.0	>6.0	Apparent
		---	---	None	---	None	Jun-Dec	>6.0	>6.0	---
929D2:										
Ava	C	---	---	None	---	None	Jan	>6.0	>6.0	---
		---	---	None	---	None	Feb-Apr	1.5-2.9	2.1-3.3	Perched
		---	---	None	---	None	May-Dec	>6.0	>6.0	---
Hickory	B	---	---	None	---	None	Jan-Dec	>6.0	>6.0	---
947D2:										
Hickory	B	---	---	None	---	None	Jan-Dec	>6.0	>6.0	---
Passport	C	---	---	None	---	None	Jan-May	1.0-2.0	>6.0	Apparent
		---	---	None	---	None	Jun-Dec	>6.0	>6.0	---
947D3:										
Hickory	B	---	---	None	---	None	Jan-Dec	>6.0	>6.0	---
Passport	C	---	---	None	---	None	Jan-May	1.0-2.0	>6.0	Apparent
		---	---	None	---	None	Jun-Dec	>6.0	>6.0	---
967F:										
Hickory	B	---	---	None	---	None	Jan-Dec	>6.0	>6.0	---
Gosport	C	---	---	None	---	None	Jan	>6.0	>6.0	---
		---	---	None	---	None	Feb-Apr	1.5-4.0	>6.0	Apparent
		---	---	None	---	None	May-Dec	>6.0	>6.0	---
991A:										
Cisne	D	0.0-0.5	Brief	Frequent	---	None	Jan-May	0.0-1.0	>6.0	Apparent
		---	---	None	---	None	Jun-Dec	>6.0	>6.0	---
Huey	D	0.0-0.5	Brief	Frequent	---	None	Jan-May	0.0-1.0	>6.0	Apparent
		---	---	None	---	None	Jun-Dec	>6.0	>6.0	---
1524A:										
Zipp	D	0.0-0.5	Long	Frequent	Long	Frequent	Jan-May	0.0-0.5	>6.0	Apparent
		---	---	None	Long	Frequent	Jun	>6.0	>6.0	---
		---	---	None	---	None	Jul-Oct	>6.0	>6.0	---
		0.0-0.5	Long	Frequent	Long	Frequent	Nov-Dec	0.0-0.5	>6.0	Apparent
3072A:										
Sharon	B	---	---	None	Brief	Frequent	Jan	>6.0	>6.0	---
		---	---	None	Brief	Frequent	Feb-Apr	1.7-6.7	>6.0	Apparent
		---	---	None	Brief	Frequent	May-Jun	>6.0	>6.0	---
		---	---	None	---	None	Jul-Oct	>6.0	>6.0	---
		---	---	None	Brief	Frequent	Nov-Dec	>6.0	>6.0	---
3108A:										
Bonnie	C/D	0.0-1.0	Brief	Frequent	Brief	Frequent	Jan-Jun	0.0-1.0	>6.0	Apparent
		---	---	None	---	None	Jul-Dec	>6.0	>6.0	---

Table 21.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency	Months	Water table: Upper limit	Water table: Lower limit	Water table: Kind
		Ft						Ft	Ft	
3108T:										
Bonnie	C/D	0.0-1.0	Brief	Frequent	Brief	Frequent	Jan-May	0.0-1.0	>6.0	Apparent
		---	---	None	Brief	Frequent	Jun	>6.0	>6.0	---
		---	---	None	---	None	Jul-Oct	>6.0	>6.0	---
		---	---	None	Brief	Frequent	Nov-Dec	>6.0	>6.0	---
3225A:										
Holton	C	---	---	None	Brief	Frequent	Jan-May	0.5-2.0	>6.0	Apparent
		---	---	None	Brief	Frequent	Jun	>6.0	>6.0	---
		---	---	None	---	None	Jul-Oct	>6.0	>6.0	---
		---	---	None	Brief	Frequent	Nov-Dec	>6.0	>6.0	---
3226A:										
Wirt	B	---	---	None	Brief	Frequent	Jan-Jun	>6.0	>6.0	---
		---	---	None	---	None	Jul-Oct	>6.0	>6.0	---
		---	---	None	Brief	Frequent	Nov-Dec	>6.0	>6.0	---
3333A:										
Wakeland	C	---	---	None	Brief	Frequent	Jan-May	0.5-2.0	>6.0	Apparent
		---	---	None	Brief	Frequent	Jun	>6.0	>6.0	---
		---	---	None	---	None	Jul-Oct	>6.0	>6.0	---
		---	---	None	Brief	Frequent	Nov-Dec	>6.0	>6.0	---
3334A:										
Birds	C/D	0.0-0.5	Brief	Frequent	Brief	Frequent	Jan-May	0.0-1.0	>6.0	Apparent
		---	---	None	Brief	Frequent	Jun	>6.0	>6.0	---
		---	---	None	---	None	Jul-Oct	>6.0	>6.0	---
		---	---	None	Brief	Frequent	Nov-Dec	>6.0	>6.0	---
3382A:										
Belknap	C	---	---	None	Brief	Frequent	Jan-May	0.5-2.0	>6.0	Apparent
		---	---	None	Brief	Frequent	Jun	>6.0	>6.0	---
		---	---	None	---	None	Jul-Oct	>6.0	>6.0	---
		---	---	None	Brief	Frequent	Nov-Dec	>6.0	>6.0	---
3415A:										
Orion	C	---	---	None	Brief	Frequent	Jan-May	1.0-2.0	>6.0	Apparent
		---	---	None	Brief	Frequent	Jun	>6.0	>6.0	---
		---	---	None	---	None	Jul-Oct	>6.0	>6.0	---
		---	---	None	Brief	Frequent	Nov-Dec	>6.0	>6.0	---
7337B:										
Creal	C	---	---	None	Brief	Rare	Jan-May	1.0-3.0	>6.0	Apparent
		---	---	None	Brief	Rare	Jun	>6.0	>6.0	---
		---	---	None	---	None	Jul-Dec	>6.0	>6.0	---
8787A:										
Banlic	C	---	---	None	Brief	Occasional	Jan-May	0.5-2.0	1.7-3.5	Perched
		---	---	None	---	None	Jun-Dec	>6.0	>6.0	---

Table 22.--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	Thickness	Hardness		Uncoated steel	Concrete
		In	In				
2A:							
Cisne	Abrupt textural change	16-21	---	---	High	High	High
3A:							
Hoyleton	---	---	---	---	High	High	High
3B:							
Hoyleton	---	---	---	---	High	High	High
3B2:							
Hoyleton	---	---	---	---	High	High	High
4B:							
Richview	---	---	---	---	High	High	High
4C2:							
Richview	---	---	---	---	High	High	High
5C3:							
Blair	---	---	---	---	High	High	Moderate
7C2:							
Atlas	---	---	---	---	Moderate	High	High
7C3:							
Atlas	---	---	---	---	High	High	High
7D2:							
Atlas	---	---	---	---	Moderate	High	High
7D3:							
Atlas	---	---	---	---	High	High	High
8D3:							
Hickory	---	---	---	---	Moderate	Moderate	Moderate
8F:							
Hickory	---	---	---	---	Moderate	Moderate	High
8G:							
Hickory	---	---	---	---	Moderate	Moderate	High
10C:							
Plumfield	Fragipan	5-20	20-35	Noncemented	High	High	High
12A:							
Wynoose	Abrupt textural change	13-30	---	---	High	High	High
13A:							
Bluford	Fragipan	30-55	6-30	Noncemented	High	High	High
13B:							
Bluford	Fragipan	30-55	6-30	Noncemented	High	High	High
13B2:							
Bluford	Fragipan	30-55	6-30	Noncemented	High	High	High

Table 22.--Soil Features--Continued

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top (In)	Restrictive layer: Thickness (In)	Restrictive layer: Hardness	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
14B:							
Ava	Fragipan	25-40	10-33	Noncemented	High	High	High
14C2:							
Ava	Fragipan	25-40	10-33	Noncemented	High	High	High
15B2:							
Parke	---	---	---	---	High	Moderate	High
109A:							
Racoon	---	---	---	---	High	High	High
120A:							
Huey	Natric horizon	8-16	16-52	---	High	High	High
218A:							
Newberry	---	---	---	---	High	High	High
421G:							
Kell	Paralithic bedrock	20-40	---	Moderately cemented	Moderate	Moderate	High
533. Urban land							
551D2:							
Gosport	Paralithic bedrock	20-40	---	Moderately cemented	Moderate	High	High
551F:							
Gosport	Paralithic bedrock	20-40	---	Moderately cemented	Moderate	High	High
551G:							
Gosport	Paralithic bedrock	20-40	---	Moderately cemented	Moderate	High	High
581A:							
Tamalco	Natric horizon	6-18	12-54	---	High	High	High
652C2:							
Passport	---	---	---	---	Moderate	High	High
652D2:							
Passport	---	---	---	---	Moderate	High	High
801B:							
Orthents	---	---	---	---	High	High	Moderate
810. Oil-waste land							
888C2:							
Passport	---	---	---	---	Moderate	High	High
Grantfork	---	---	---	---	High	High	Moderate
908D2:							
Hickory	---	---	---	---	Moderate	Moderate	High
Kell	Paralithic bedrock	20-40	---	Moderately cemented	Moderate	Moderate	High

Table 22.--Soil Features--Continued

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Restrictive layer: Thickness	Restrictive layer: Hardness	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In	In				
908F:							
Hickory	---	---	---	---	Moderate	Moderate	High
Kell	Paralithic bedrock	20-40	---	Moderately cemented	Moderate	Moderate	High
912A:							
Hoyleton	---	---	---	---	High	High	High
Darmstadt	Natric horizon	10-20	10-50	---	High	High	Moderate
912B:							
Hoyleton	---	---	---	---	High	High	High
Darmstadt	Natric horizon	10-20	10-50	---	High	High	Moderate
912B2:							
Hoyleton	---	---	---	---	High	High	High
Darmstadt	Natric horizon	6-20	10-54	---	High	High	High
914C2:							
Atlas	---	---	---	---	High	High	High
Grantfork	Abrupt textural change	5-10	---	---	Moderate	High	High
929D2:							
Ava	Fragipan	25-40	10-35	Noncemented	High	High	High
Hickory	---	---	---	---	Moderate	Moderate	High
947D2:							
Hickory	---	---	---	---	Moderate	Moderate	High
Passport	---	---	---	---	Moderate	High	High
947D3:							
Hickory	---	---	---	---	Moderate	Moderate	High
Passport	---	---	---	---	Moderate	High	High
967F:							
Hickory	---	---	---	---	Moderate	Moderate	High
Gosport	Paralithic bedrock	20-40	---	Moderately cemented	Moderate	High	High
991A:							
Cisne	Abrupt textural change	16-21	---	---	High	High	High
Huey	Natric horizon	8-16	16-52	---	High	High	High
1524A:							
Zipp	---	---	---	---	High	Moderate	Moderate
3072A:							
Sharon	---	---	---	---	High	Moderate	High
3108A:							
Bonnie	---	---	---	---	High	High	Moderate

Table 22.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness		Uncoated steel	Concrete
		In	In				
3108T:							
Bonnie-----------------	---	---	---	---	High	High	High
3225A:							
Holton-----------------	---	---	---	---	High	High	Moderate
3226A:							
Wirt-------------------	---	---	---	---	Moderate	High	Moderate
3333A:							
Wakeland---------------	---	---	---	---	High	High	Moderate
3334A:							
Birds------------------	---	---	---	---	High	High	Moderate
3382A:							
Belknap----------------	---	---	---	---	High	High	High
3415A:							
Orion------------------	---	---	---	---	High	High	Moderate
7337B:							
Creal------------------	---	---	---	---	High	High	High
8787A:							
Banlic-----------------	Fragipan	15-36	---	Noncemented	High	High	High

Table 23.--Engineering Index Test Data

(Absence of an entry indicates that data were not available. MAX means maximum dry density; OPT, optimum moisture; LL, liquid limit; and PI, plasticity index)

Soil name	Sample number	Horizon	Depth	Moisture density		Percentage passing sieve*				LL	PI	Classification	
				MAX	OPT	No. 4	No. 10	No. 40	No. 200			AASHTO	Unified
			In	lb/ft^3	Pct					Pct			
Ava-----------	85IL-121-5-1	Ap	0-7	106.2	18.2	100	99.7	98.3	95.2	32.0	6.6	A-4	ML
	-5-3	Bt	11-20	105.4	19.4	---	100	99.6	98.7	43.3	17.1	A-7-6	CL
	-5-6	B't	25-30	106.6	19.0	100	99.7	99.4	98.0	43.6	21.6	A-7-6	CL
	-5-7	2BC	37-52	114.7	15.3	100	99.9	98.1	87.5	27.4	11.4	A-6	CL
Darmstadt-----	86IL-121-16-1	Ap	0-7	105.3	18.0	99.9	99.8	96.6	89.5	34.0	10.8	A-6	CL
	-16-2	Bt1	7-14	95.7	20.5	100	99.6	97.6	89.3	56.6	32.7	A-7-6	CH
	-16-4	2Bt3	20-35	114.2	15.6	100	99.1	96.7	86.2	36.7	20.6	A-6	CL
	-16-6	2Btg2	46-60	114.1	15.7	100	99.5	96.7	83.4	35.5	20.9	A-6	CL
Grantfork-----	85IL-121-60-3	Bt	9-16	112.3	16.2	99.4	97.5	94.5	78.3	40.7	20.6	A-7-6	CL
	-60-5	2Btg2	30-42	115.8	14.8	97.4	96.2	91.6	72.7	37.3	22.9	A-6	CL
	-60-6	2Btg3	42-53	117.5	14.2	98.1	97.1	92.2	64.9	33.0	19.9	A-6	CL
Hickory-------	85IL-121-9-1	Ap	0-4	110.8	15.8	98.5	97.5	89.1	59.1	31.8	9.8	A-4	CL
	-9-4	Bt3	22-34	110.0	16.0	97.2	93.2	86.6	64.2	41.9	25.5	A-7-6	CL
	-9-6	BC	47-63	121.1	12.8	98.5	96.3	95.5	76.7	27.7	12.7	A-6	CL
Holton--------	85IL-121-48-2	A2	2-9	112.6	14.0	99.3	98.2	92.7	63.2	29.1	7.7	A-4	CL
	-48-4	Bw3	14-26	122.1	10.7	99.7	97.3	92.0	54.9	18.6	2.5	A-4	ML
	-48-6	C2	33-53	122.8	10.9	99.0	94.8	89.4	51.9	18.8	2.8	A-4	ML
Hoyleton------	84IL-121-45-1	Ap	0-8	107.2	15.5	---	100	94.2	87.5	27.9	4.9	A-4	ML
	-45-3	Bt2	21-30	97.1	22.8	---	100	98.1	92.1	47.9	24.8	A-7-6	CL
	-45-5	2BC	39-50	116.3	14.0	99.7	99.2	96.3	85.7	31.2	14.7	A-6	CL
Huey----------	85IL-121-59-1	Ap	0-7	107.4	17.6	99.7	98.9	97.7	94.9	32.2	13.1	A-6	CL
	-59-3	Btg2	15-23	108.8	18.4	100	99.8	99.0	96.8	51.8	37.5	A-7-6	CH
	-59-5	Btg4	36-52	106.3	19.9	100	99.6	98.4	95.8	51.6	31.5	A-7-6	CH
Passport------	85IL-121-6-1	Ap	0-4	110.1	16.1	99.8	99.4	95.2	85.2	34.3	15.9	A-6	CL
	-6-3	Bt2	11-25	118.1	13.5	99.1	98.1	91.0	68.9	30.2	8.2	A-4	CL
	-6-5	Bt4	40-54	120.8	12.4	98.4	95.5	88.0	61.3	28.9	16.0	A-6	CL
Richview------	84IL-121-50-1	Ap	0-9	105.9	17.8	100	99.8	98.4	96.2	33.4	11.4	A-6	CL
	-50-4	Bt3	22-34	112.3	16.1	---	100	99.4	83.2	30.9	12.9	A-6	CL
	-50-7	2Bt6	48-56	124.1	11.2	99.8	99.6	98.7	45.1	17.8	4.1	A-4	SM-SC

See footnote at end of table.

Table 23.--Engineering Index Test Data--Continued

Soil name	Sample number	Horizon	Depth	Moisture density		Percentage passing sieve*				LL	PI	Classification	
				MAX	OPT	No. 4	No. 10	No. 40	No. 200			AASHTO	Unified
			In	lb/ft^3	Pct					Pct			
Wakeland------	84IL-121-51-1	A	0-13	114.3	14.0	---	100	99.7	84.6	27.2	7.2	A-4	CL
	-51-4	C2	20-28	113.7	14.3	---	100	99.8	82.9	27.7	7.8	A-4	CL
	-51-6	C4	46-52	115.1	13.6	---	100	93.9	72.9	30.7	8.4	A-4	CL

* Analysis according to AASHTO designation T88. Results by this procedure frequently differ somewhat from results obtained by the soil survey procedure of the Natural Resources Conservation Service (NRCS).

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