United States Department of Agriculture

Natural Resources Conservation Service

In cooperation with Illinois Agricultural Experiment Station

Soil Survey of Vermilion County, Illinois

How To Use This Soil Survey

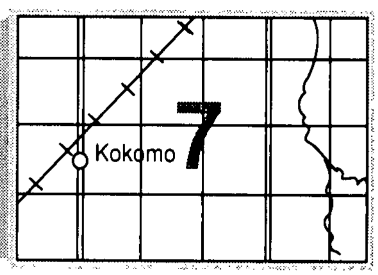
General Soil Map

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

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

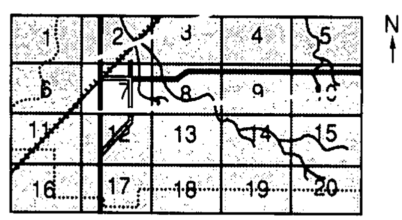
Detailed Soil Maps

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



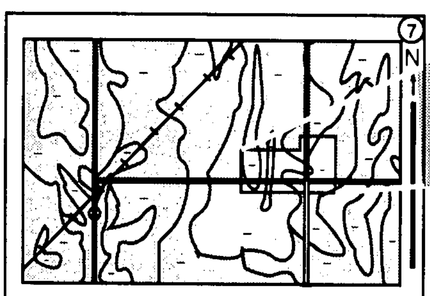
MAP SHEET

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

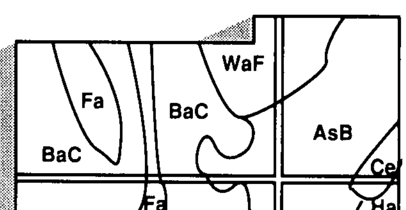


INDEX TO MAP SHEETS

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



MAP SHEET



AREA OF INTEREST

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.

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

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

Major fieldwork for this soil survey was completed in 1986. Soil names and descriptions were approved in 1987. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1986. 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 Vermilion County Soil and Water Conservation District. Financial support was provided by the Vermilion County Board and the Illinois Department of Agriculture.

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.

This soil survey is Illinois Agricultural Experiment Station Soil Report 141.

All programs and services of the Natural Resources Conservation Service are offered on a nondiscriminatory basis, without regard to race, color, national origin, religion, sex, age, marital status, or handicap.

Cover: Soybeans and corn in an area of the Elliott-Ashkum-Varna association.

Contents

Issued February 1996

Index to Map Units

Summary of Tables

Foreword

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

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

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

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

Thomas W. Christenson
State Conservationist
Natural Resources Conservation Service

Soil Survey of Vermilion County, Illinois

By C.E. Wacker

Soils surveyed by C.E. Wacker, R.W. Bond, D.C. Hallbick, J.R. Pearse, and B.R. Putman, Natural Resources Conservation Service, and L.L. Craft, D.J. Gaber, T.J. O'Connor, S. Redschlag, L.M. Rhode, and S.E. Rodock, Vermilion County

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

VERMILION COUNTY is in the east-central part of Illinois (fig. 1). It has an area of 577,030 acres, or about 901 square miles. It is bordered on the north by Iroquois County, on the west by Champaign and Ford Counties, on the south by Edgar County, and on the east by Indiana. In 1980, the population of the county was 95,222. Danville, the county seat and the largest city, had a population of 38,985 *(10)*.

This survey updates the soil survey of Vermilion County published by the University of Illinois in 1938 *(11)*. It provides additional information and has larger maps, which show the soils in greater detail.

General Nature of the County

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

Climate

Table 1 gives data on temperature and precipitation for the survey area as recorded at Danville in the period 1960 to 1991. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter, the average temperature is 28.4 degrees F and the average daily minimum temperature is 19.6 degrees. The lowest temperature on record, which occurred at Danville on January 17, 1982, is -26 degrees. In summer, the average temperature is 73.4 degrees and the average daily maximum temperature is 85.2 degrees. The highest recorded temperature, which occurred at Danville on July 14, 1936, is 112 degrees.

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

The total annual precipitation is 39.65 inches. Of this, 23.68 inches, or 60 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 18 inches. The heaviest 1-day rainfall during the period of record was 5.40 inches at Danville on August 4, 1968. Thunderstorms occur on about 41 days each year, and most occur in July.

The average seasonal snowfall is 23.6 inches. The greatest snow depth at any one time during the period of record was 18 inches. On the average, 23 days of the year have at least 1 inch of snow on the ground. The number of such days varies greatly from year to year.

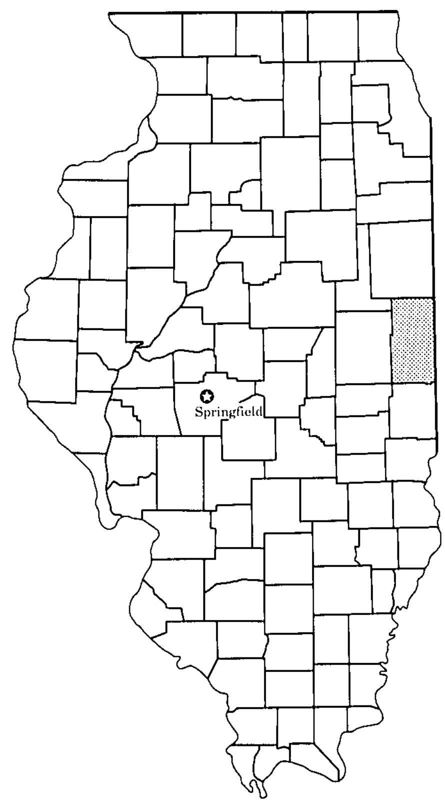


Figure 1.—Location of Vermilion County in Illinois.

History and Development

Ann Bauer, director, Vermilion County Museum, helped prepare this section.

On January 18, 1826, Vermilion County was formed from the northern part of Edgar County. The boundaries have remained unchanged since 1859, when Ford County was formed *(3)*.

Salt attracted the early settlers to Vermilion County. The first farm was established in 1820 by James D. Butler. By the 1840's, the salt industry had been abandoned and agriculture had become more important. Shorthorn cattle were introduced, and livestock production increased. Extensive coal mining began in the 1860's, and by 1899, Vermilion County was the largest coal producer in Illinois. The county's clay deposits were also extensively mined for one of the world's largest brick plants *(6)*.

Diverse economic, cultural, social, and educational institutions have been established in the county. Danville Area College was established in 1946. A variety of libraries, newspapers, and radio stations serve local communities. Several large and many smaller industries are established in Vermilion County. The principal manufactured products are ballasts for fluorescent light fixtures, aerosol products, industrial lift trucks, iron and steel castings, fireworks, fertilizers, animal feeds, food products, and packaging material. Agriculture and agribusiness are important parts of the local economy. In 1983, 80 percent of the acreage in the county was used for cultivated crops, primarily corn and soybeans.

Natural Resources

Soil is an important resource in Vermilion County. There are more than 456,000 acres of cropland. About 91 percent of the cropland is prime farmland. Corn and soybeans are the major crops. Other farm products include winter wheat, hay, oats, vegetables, cattle, hogs, and eggs. Most of the soils are nearly level or gently sloping and formed in medium textured to fine textured material under tall prairie grasses. These factors, combined with a favorable climate, result in highly productive farmland.

Drinking water is supplied both by reservoirs and by wells. Ground-water resources are in water-bearing sand and gravel deposits throughout the county. Lake Vermilion provides drinking water for Danville and the surrounding areas. Many farm ponds provide water for livestock.

The county has about 33,500 acres of woodland, mainly along river valleys. Native prairie plants grow along railroads and in protected areas. The Middle Fork Wildlife Area, Kennekuk Cove County Park, Kickapoo State Park, and Forest Glen County Preserve provide suitable habitat for wildlife. More than 1,000 acres of lakes and about 150 miles of rivers provide fishing and recreational opportunities *(6)*.

In the western part of the county, near Fairmount, a large limestone quarry has been in operation since the early 1900's. It produces crushed limestone for concrete aggregate.

Vermilion County has more than 3 billion tons of minable coal reserves *(5)*. Past mining produced more than 160 million tons of coal. Both underground and strip mining methods have been used. More than 6,000 acres of land in Vermilion County have been strip mined.

Relief, Physiography, and Drainage

All of Vermilion County was covered by the Kansan, Illinoian, and Wisconsin glaciers during the Pleistocene glacial epoch. The Wisconsin was the most recent stage of glaciation. This glacier deposited an average of 200 feet of glacial drift, which forms the present topography *(12)*. In many areas this glacial drift is covered by 1 to 7 feet of windblown silt, or loess.

The county is dissected by several gently undulating moraines separated by nearly level till plains or outwash plains. Steep and very steep slopes are near the river valleys. The highest feature in the county is the Gifford Moraine, which reaches an elevation of 790 feet, northwest of Collison. The lowest elevation, in the area where the Vermilion River leaves the county, is 490 feet.

Most of Vermilion County is drained by the Vermilion River and its tributaries, including the North Fork, Middle Fork, and Salt Fork Rivers. The Little Vermilion River drains the southern part of the county. These watercourses drain primarily to the south and east, toward the Wabash River.

How This Survey Was Made

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

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

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-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. 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 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 assure that a high water table will always be at a specific level in the soil on a specific date.

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

The soil survey of Vermilion County joins the soil surveys of Champaign, Ford, and Iroquois Counties in Illinois and Warren, Benton, and Vermillion Counties in Indiana. In places the soil names on the maps do not agree across county boundaries because of differences in the detail of mapping or in the extent of the soils in the different survey areas.

Map Unit Composition

A map unit delineation on a soil map represents an area dominated by one major kind of soil or an area dominated by two or three kinds of soil. A map unit is identified and named according to the taxonomic classification of the dominant soil or soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural objects. In common with other natural objects, they have a characteristic variability in their properties. 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 soils of other taxonomic classes. Consequently, every map unit is made up of the soil or soils for which it is named and some soils that belong to other taxonomic classes. These latter soils are called inclusions or included soils.

Most inclusions have properties and behavioral patterns 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 (similar) inclusions. They may or may not be mentioned in the map unit descriptions. Other inclusions, however, have properties and behavior divergent enough to affect use or require different management. These are contrasting (dissimilar) inclusions. They generally occupy small areas and cannot be shown separately on the soil maps because of the scale used in mapping. The inclusions of contrasting soils are mentioned in the map unit descriptions. A few inclusions may not have been observed and consequently are not mentioned in the descriptions, especially where the soil pattern was so complex that it was impractical to make enough observations to identify all of the kinds of soil on the landscape.

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

General Soil Map Units

Laura L. Craft, soil scientist, Vermilion County, helped prepare this section.

The general soil map at the back of this publication shows the soil associations in this survey area. Each association has a distinctive pattern of soils, relief, and drainage. Each is a unique natural landscape. Typically, an association consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one association can occur in another but in a different pattern.

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

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

Soil Descriptions

Nearly Level and Gently Sloping Soils That Have a Moderately Permeable or Moderately Slowly Permeable Subsoil; on Uplands

These soils are on till plains and outwash plains. They make up about 39 percent of the county. Most areas are used for cultivated crops. Seasonal wetness and water erosion are the main management concerns.

1. Drummer-Flanagan Association

Poorly drained and somewhat poorly drained soils that formed in loess or silty material and in the underlying glacial outwash or loamy glacial till; on till plains

This association consists of nearly level soils. Small depressional areas and steeper side slopes are common. Most areas are drained by ditches, small creeks, and drainageways. Slopes generally range from 0 to 2 percent.

This association makes up about 16 percent of the county. It is about 50 percent Drummer soils, 40 percent Flanagan soils, and 10 percent minor soils (fig. 2).

The poorly drained Drummer soils are in broad, flat areas and in shallow depressions and drainageways below the Flanagan soils. Typically, the surface soil is black, friable silty clay loam about 13 inches thick. The subsoil is about 41 inches thick. It is mottled. The upper part is dark gray and gray, friable silty clay loam, and the lower part is gray, friable, calcareous, stratified loam, clay loam, and silt loam. The underlying material to a depth of 60 inches or more is light gray, mottled, friable, stratified loam, silt loam, and clay loam.

The somewhat poorly drained Flanagan soils are on slight rises above the Drummer soils. Typically, the surface layer is black, very friable silt loam about 8 inches thick. The subsurface layer is very dark gray, friable silt loam about 8 inches thick. The subsoil is about 40 inches thick. It is mottled. The upper part is dark brown, friable silty clay loam; the next part is dark brown, firm silty clay loam; and the lower part is light olive brown, calcareous clay loam. The underlying material to a depth of 60 inches or more is light olive brown, mottled, very firm, calcareous loam.

Of minor extent in this association are Catlin, Harpster, Pella, and Peotone soils. The moderately well drained, gently sloping Catlin soils are on side slopes and ridgetops. The poorly drained, nearly level Harpster and Pella soils are in broad, flat areas and in shallow depressions. The very poorly drained, nearly level Peotone soils are in depressions.

Most areas of this association are used for cultivated crops. The soils are well suited to the cultivated crops commonly grown in the county. The main management needs are measures that maintain or improve the drainage system, tilth, and fertility.

2. Sable-Ipava Association

Poorly drained and somewhat poorly drained soils that formed in loess; on till plains and outwash plains

This association consists mainly of nearly level soils. Small depressional areas and steeper side slopes are

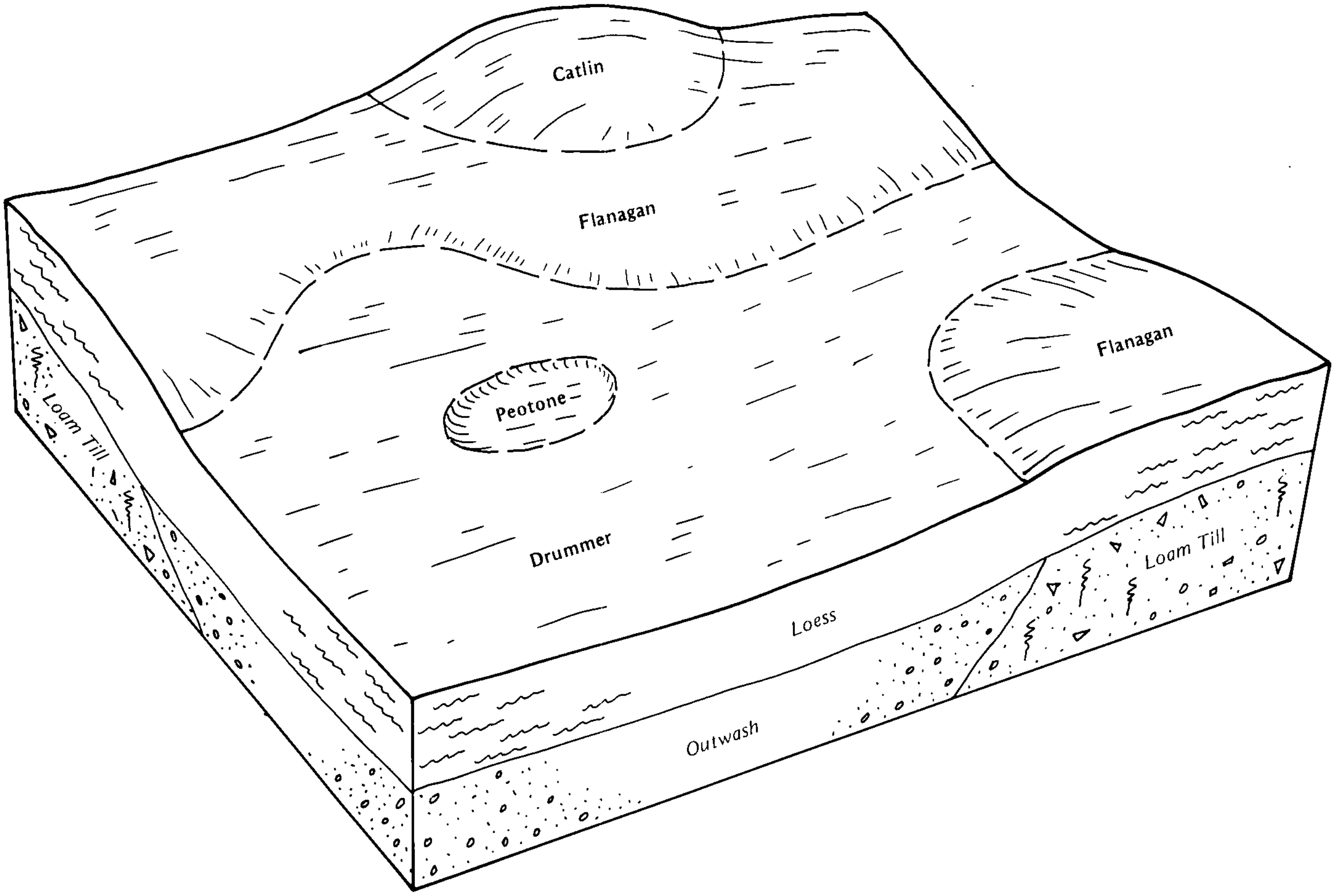


Figure 2.—Typical pattern of soils and parent material in the Drummer-Flanagan association.

common. Most areas are drained by ditches, small creeks, and drainageways. Slopes generally range from 0 to 2 percent.

This association makes up about 2 percent of the county. It is about 40 percent Sable soils, 24 percent Ipava soils, and 36 percent minor soils.

The poorly drained Sable soils are in broad, flat areas and in shallow depressions and drainageways below the Ipava soils. Typically, the surface soil is black, friable silty clay loam about 14 inches thick. The subsoil is about 34 inches thick. It is dark gray and gray, mottled, firm silty clay loam. The underlying material to a depth of 70 inches or more is light olive gray, mottled, firm, calcareous silt loam.

The somewhat poorly drained Ipava soils are on slight rises above the Sable soils. Typically, the surface soil is black and very dark gray, friable silt loam about 14 inches thick. The subsoil is silty clay loam about 32 inches thick. It is mottled. The upper part is brown and friable, and the lower part is brown and grayish brown and is firm. The underlying material to a depth of 60 inches or more is light brownish gray, mottled, firm, calcareous silt loam.

Of minor extent in this association are Catlin and Peotone soils. The moderately well drained, gently sloping Catlin soils are on side slopes and ridgetops. The very poorly drained, nearly level Peotone soils are in depressions.

Most areas of this association are used for cultivated crops. The soils are well suited to the cultivated crops commonly grown in the county. The main management needs are measures that maintain or improve the drainage system, tilth, and fertility.

3. Drummer-Brenton-Milford Association

Poorly drained and somewhat poorly drained soils that formed in loess or silty material and in the underlying glacial outwash; on outwash plains

This association consists mainly of nearly level soils.

Small depressional areas and steeper side slopes are common. Most areas are drained by ditches, small creeks, and drainageways. Slopes generally range from 0 to 2 percent.

This association makes up about 11 percent of the county. It is about 25 percent Drummer soils, 14 percent Brenton soils, 10 percent Milford soils, and 51 percent minor soils.

The poorly drained Drummer soils are in broad, flat areas and in shallow depressions and drainageways below the Brenton soils. Typically, the surface soil is black, friable silty clay loam about 13 inches thick. The subsoil is about 41 inches thick. It is mottled. The upper part is dark gray and gray, friable silty clay loam, and the lower part is gray, friable, calcareous, stratified loam, clay loam, and silt loam. The underlying material to a depth of 60 inches or more is light gray, mottled, friable, stratified loam, silt loam, and clay loam.

The somewhat poorly drained Brenton soils are on slight rises above the Drummer and Milford soils. Typically, the surface soil is very dark gray, friable silt loam about 12 inches thick. The subsoil is about 36 inches thick. It is dark brown and dark yellowish brown and is mottled. The upper part is friable silty clay loam; the next part is friable, stratified clay loam and loam; and the lower part is very friable, stratified loam and sandy loam. The underlying material to a depth of 60 inches or more is dark yellowish brown, stratified loam, sandy loam, and loamy sand.

The poorly drained Milford soils are in broad, flat areas and in shallow depressions and drainageways below the Brenton soils. Typically, the surface soil is black and very dark gray, friable silty clay loam about 18 inches thick. The subsoil is about 34 inches thick. It is mottled. The upper part is dark grayish brown, firm silty clay loam, and the lower part is gray, friable silty clay loam that has strata of clay loam. The underlying material to a depth of 60 inches or more is mottled gray and light olive brown, friable, stratified silty clay loam, clay loam, and loam.

Of minor extent in this association are Catlin, Elburn, Jasper, La Hogue, Pella, and Proctor soils. The moderately well drained Catlin soils are on side slopes and ridgetops above the Drummer soils. The somewhat poorly drained, nearly level Elburn and La Hogue soils are on slight rises. The moderately well drained and well drained, nearly level to moderately sloping Jasper and Proctor soils are on side slopes and ridgetops. The poorly drained Pella soils are in shallow depressions below the Brenton soils.

Most areas of this association are used for cultivated crops. The soils are well suited to the cultivated crops commonly grown in the county. The main management needs are measures that maintain or improve the drainage system, tilth, and fertility.

4. Milford-Lisbon Association

Poorly drained and somewhat poorly drained soils that formed in silty and loamy sediments or in loess or silty material and in the underlying loamy glacial till; on till plains

This association consists mainly of nearly level soils. Small depressional areas and steeper side slopes are common. Most areas are drained by ditches, small creeks, and drainageways. Slopes generally range from 0 to 2 percent.

This association makes up about 3 percent of the county. It is about 38 percent Milford soils, 21 percent Lisbon soils, and 41 percent minor soils (fig. 3).

The poorly drained Milford soils are in broad, flat areas and in shallow depressions and drainageways below the Lisbon soils. Typically, the surface soil is black and very dark gray, friable silty clay loam about 18 inches thick. The subsoil is about 34 inches thick. It is mottled. The upper part is dark grayish brown, firm silty clay loam, and the lower part is gray, friable silty clay loam that has strata of clay loam. The underlying material to a depth of 60 inches or more is mottled gray and light olive brown, friable, stratified silty clay loam, clay loam, and loam.

The somewhat poorly drained Lisbon soils are on slight rises above the Milford soils. Typically, the surface soil is very dark gray, friable silt loam about 11 inches thick. The subsoil is about 28 inches thick. It is mottled. The upper part is dark brown and dark grayish brown, friable silty clay loam; the next part is grayish brown, friable clay loam; and the lower part is grayish brown, friable, calcareous clay loam. The underlying material to a depth of 60 inches or more is brownish gray, mottled, firm, calcareous silt loam.

Of minor extent in this association are Andres, Corwin, Odell, Peotone, and Saybrook soils. The somewhat poorly drained, nearly level Andres and Odell soils are on slight rises. The moderately well drained, gently sloping Corwin and Saybrook soils are on side slopes and ridgetops. The very poorly drained, nearly level Peotone soils are in depressions.

Most areas of this association are used for cultivated crops. The soils are well suited to the cultivated crops commonly grown in the county. The main management needs are measures that maintain or improve the drainage system, tilth, and fertility.

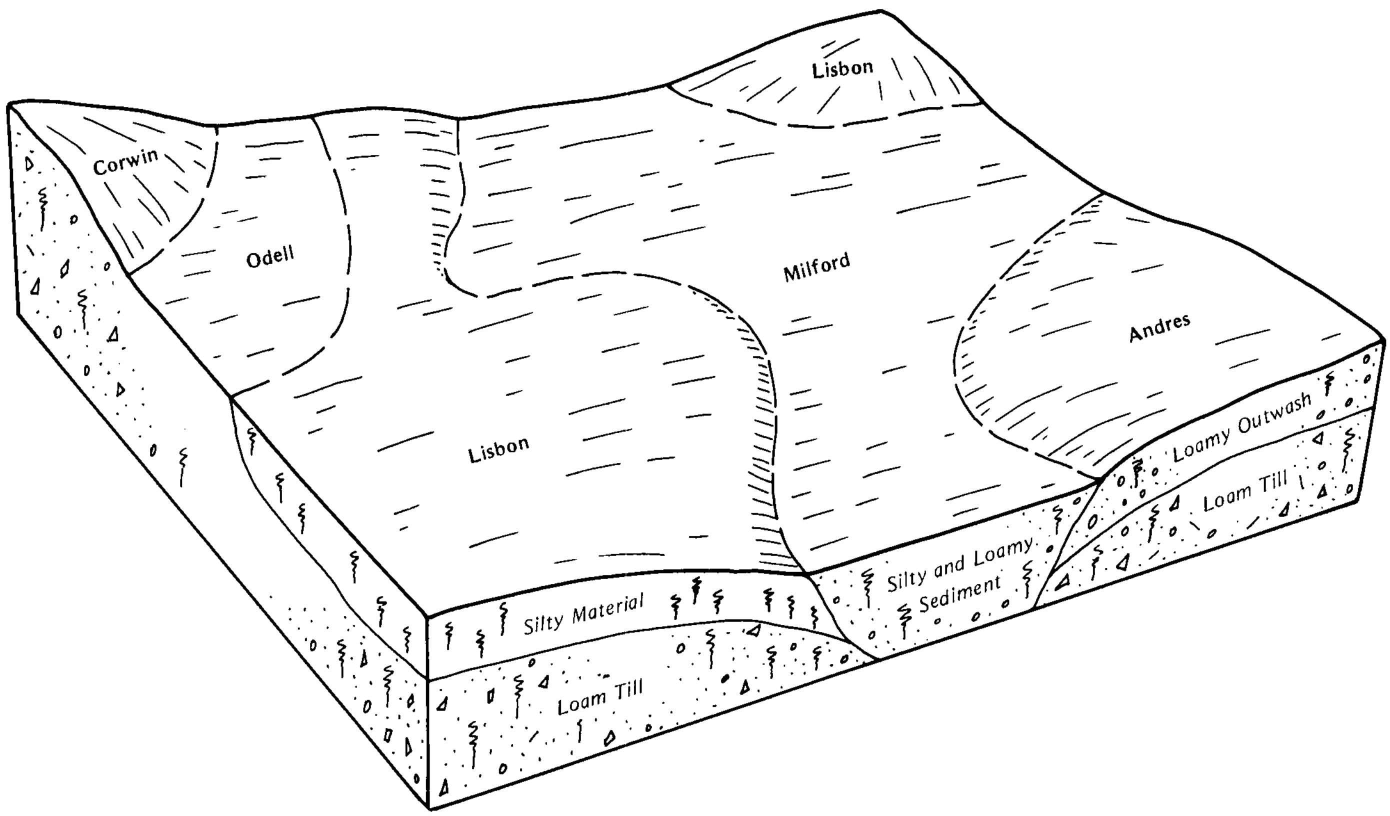


Figure 3.—Typical pattern of soils and parent material in the Milford-Lisbon association.

5. Raub-Drummer-Dana Association

Poorly drained to moderately well drained soils that formed in loess or silty material and in the underlying glacial outwash or loamy glacial till; on moraines

This association consists of nearly level and gently sloping soils. Small depressional areas and steeper side slopes are common. Most areas are drained by ditches, small creeks, and drainageways. Slopes generally range from 0 to 5 percent.

This association makes up about 7 percent of the county. It is about 22 percent Raub soils, 21 percent Drummer soils, 16 percent Dana soils, and 41 percent minor soils (fig. 4).

The somewhat poorly drained Raub soils are on slight rises above the Drummer soils and below the Dana soils. Typically, the surface soil is very dark gray, friable silt loam about 12 inches thick. The subsoil is about 36 inches thick. It is mottled. The upper part is dark brown and yellowish brown, firm silty clay loam, and the lower part is yellowish brown, firm clay loam. The underlying material to a depth of 60 inches or more is yellowish brown, mottled, firm, calcareous loam.

The poorly drained Drummer soils are in broad, flat areas and in shallow depressions and drainageways. Typically, the surface soil is black, friable silty clay loam about 13 inches thick. The subsoil is about 41 inches thick. It is mottled. The upper part is dark gray and gray, friable silty clay loam, and the lower part is gray, friable, calcareous, stratified loam, clay loam, and silt loam. The underlying material to a depth of 61 inches or more is light gray, mottled, friable, stratified loam, silt loam, and clay loam.

The moderately well drained Dana soils are on side slopes and ridgetops above the Raub and Drummer soils. Typically, the surface soil is very dark gray, friable silt loam about 7 inches thick. The subsoil is about 40 inches thick. The upper part is dark yellowish brown, friable silty clay loam; the next part is dark yellowish brown, mottled, friable clay loam; and the lower part is olive brown, mottled, friable loam. The underlying material to a depth of 60 inches or more is olive brown, mottled, friable, calcareous loam.

Of minor extent in this association are Catlin, Flanagan, and Parr soils. The moderately well drained, gently sloping Catlin soils are on side slopes and ridgetops. The somewhat poorly drained, nearly level Flanagan soils are on slight rises. The well drained, moderately sloping Parr soils are on side slopes and ridgetops.

Most areas of this association are used for cultivated crops. The soils are well suited to the cultivated crops commonly grown in the county. The main management needs are measures that control erosion on the Dana soils, maintain or improve the drainage system in the Raub and Drummer soils, and maintain or improve tilth and fertility.

Nearly Level to Moderately Sloping Soils That Have a Moderately Slowly Permeable or Slowly Permeable Subsoil; on Uplands

These soils are on moraines and till plains. They make up 27 percent of the county. Most areas are used for cultivated crops. Seasonal wetness and water erosion are the main management concerns.

6. Ashkum-Elliott-Andres Association

Poorly drained and somewhat poorly drained soils that formed in silty or loamy material and in the underlying silty glacial till; on till plains

This association consists mainly of nearly level and gently sloping soils. Small depressional areas and steeper side slopes are common. Most areas are drained by ditches, small creeks, and drainageways. Slopes generally range from 0 to 6 percent.

This association makes up about 18 percent of the county. It is about 44 percent Ashkum soils, 30 percent Elliott soils, 10 percent Andres soils, and 16 percent minor soils (fig. 5).

The poorly drained Ashkum soils are in broad, flat areas and in shallow depressions and drainageways below the Elliott and Andres soils. Typically, the surface

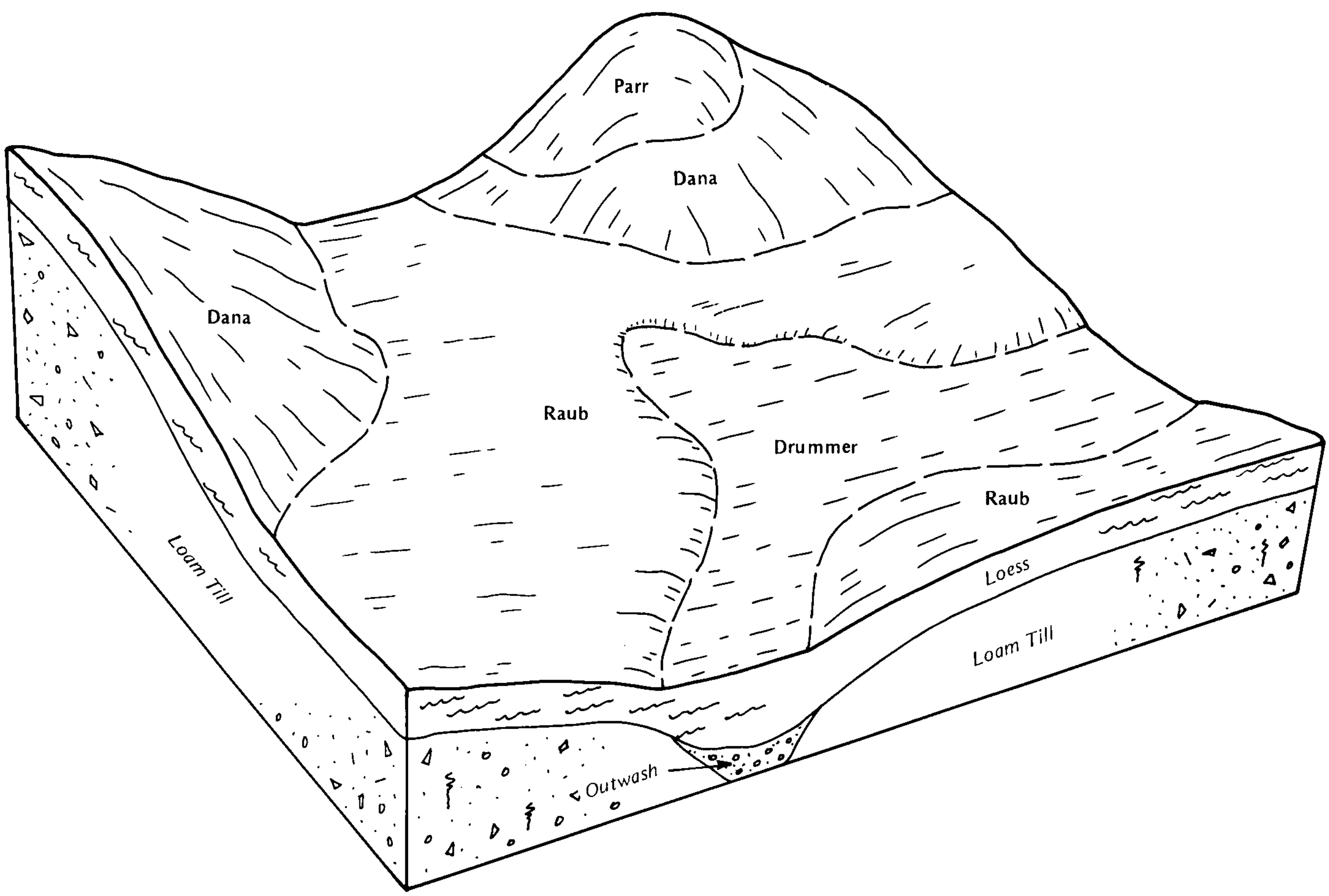


Figure 4.—Typical pattern of soils and parent material in the Raub-Drummer-Dana association.

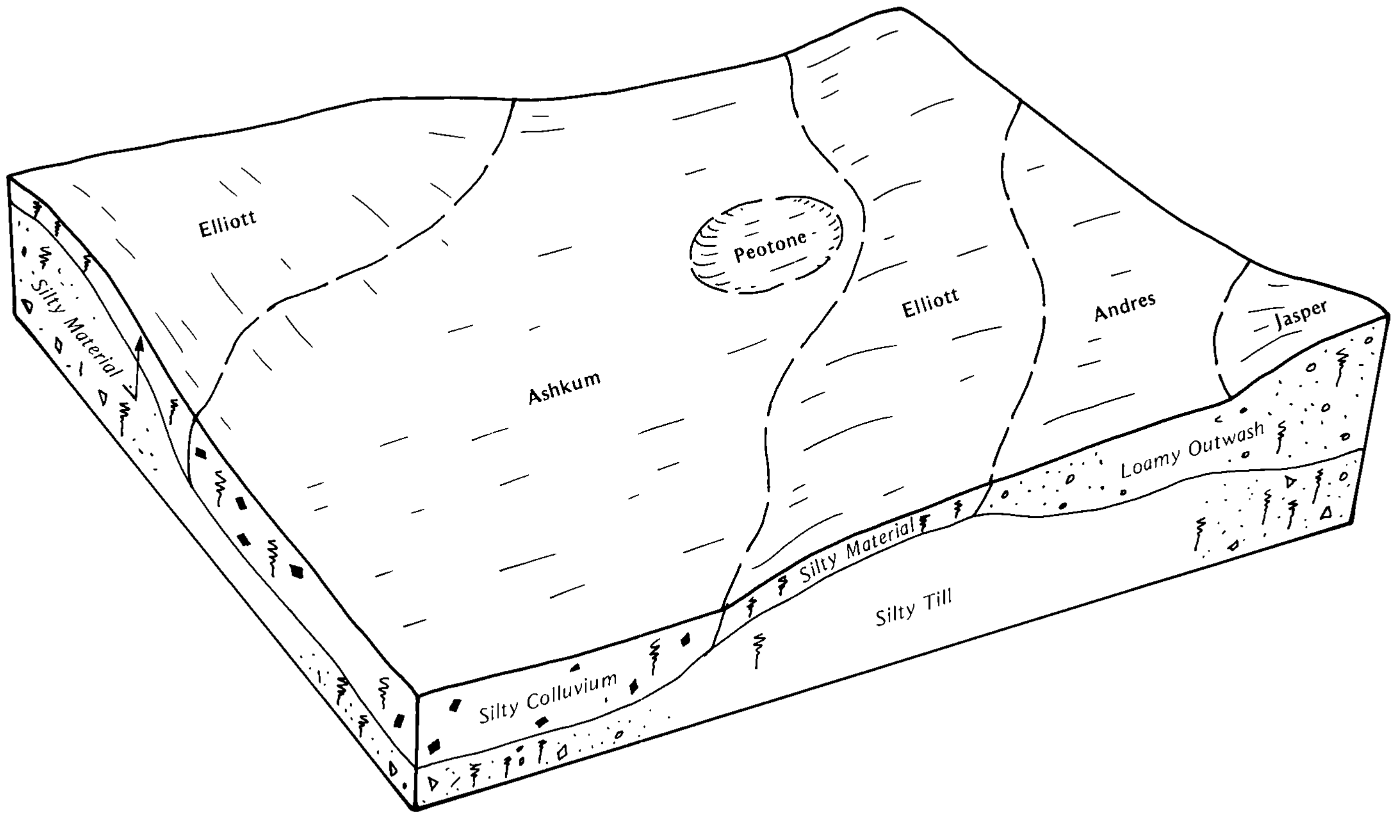


Figure 5.—Typical pattern of soils and parent material in the Ashkum-Elliott-Andres association.

soil is black, friable silty clay loam about 18 inches thick. The subsoil is silty clay loam about 34 inches thick. The upper part is dark gray and friable, and the lower part is gray and light gray, mottled, and firm. The underlying material to a depth of 60 inches or more is light gray, mottled, firm, calcareous silty clay loam.

The somewhat poorly drained Elliott soils are on slight rises or on side slopes and ridgetops above the Ashkum soils. Typically, the surface soil is very dark gray, friable silt loam about 12 inches thick. The subsoil is about 28 inches thick. It is mottled. The upper part is olive brown, friable silty clay loam and silty clay; the next part is light olive brown, friable silty clay loam; and the lower part is light olive brown, friable, calcareous silty clay loam. The underlying material to a depth of 60 inches or more is light olive brown, mottled, firm, calcareous silty clay loam.

The somewhat poorly drained Andres soils are on slight rises above the Ashkum soils. Typically, the surface soil is very dark gray, friable loam about 12 inches thick. The subsoil is about 38 inches thick. The upper part is dark brown, friable clay loam; the next part is dark yellowish brown and yellowish brown, mottled, friable clay loam; and the lower part is olive brown, mottled, firm, calcareous silty clay loam. The underlying material to a depth of 60 inches or more is olive brown, mottled, very firm, calcareous silty clay loam.

Of minor extent in this association are Jasper, La Hogue, Peotone, Symerton, and Varna soils. The well drained, nearly level to moderately sloping Jasper soils are on slight rises or on side slopes and ridgetops. The somewhat poorly drained, nearly level La Hogue soils are on slight rises. The very poorly drained, nearly level Peotone soils are in depressions. The moderately well drained, gently sloping Symerton soils are on side slopes and ridgetops. The moderately well drained, gently sloping and moderately sloping Varna soils are also on side slopes and ridgetops.

Most areas of this association are used for cultivated crops. The soils are very well suited to the cultivated crops commonly grown in the county. The main management needs are measures that control erosion on the Elliott soils and that maintain or improve the drainage system, tilth, and fertility.

7. Elliott-Ashkum-Varna Association

Somewhat poorly drained, poorly drained, and moderately well drained soils that formed in silty glacial till or in silty material and in the underlying silty glacial till; on moraines

This association consists of nearly level to moderately sloping soils. Small depressional areas are common. Most areas are drained by ditches, small creeks, and drainageways. Slopes generally range from 0 to 8 percent.

This association makes up about 9 percent of the county. It is about 68 percent Elliott soils, 18 percent Ashkum soils, 4 percent Varna soils, and 10 percent minor soils.

The somewhat poorly drained Elliott soils are on slight rises or on side slopes and ridgetops above the Ashkum soils. Typically, the surface soil is very dark gray, friable silt loam about 12 inches thick. The subsoil is about 28 inches thick. It is mottled. The upper part is olive brown, friable silty clay loam and silty clay; the next part is light olive brown, friable silty clay loam; and the lower part is light olive brown, friable, calcareous silty clay loam. The underlying material to a depth of 60 inches or more is light olive brown, mottled, firm, calcareous silty clay loam.

The poorly drained Ashkum soils are in broad, flat areas and in shallow depressions and drainageways below the Elliott and Varna soils. Typically, the surface soil is black, friable silty clay loam about 18 inches thick. The subsoil is silty clay loam about 34 inches thick. The upper part is dark gray and friable, and the lower part is gray and light gray, mottled, and firm. The underlying material to a depth of 60 inches or more is light gray, mottled, firm, calcareous silty clay loam.

The moderately well drained Varna soils are on side slopes and ridgetops above the Elliott and Ashkum soils. Typically, the surface soil is very dark gray, friable silt loam about 8 inches thick. The subsoil is olive brown silty clay loam about 30 inches thick. The upper part is friable; the next part is mottled and friable; and the lower part is mottled, friable and firm, and calcareous. The underlying material to a depth of 60 inches or more is light olive brown, mottled, firm, calcareous silty clay loam.

Of minor extent in this association are Andres, Corwin, and Symerton soils. The somewhat poorly drained, nearly level Andres soils are on slight rises. The moderately well drained, gently sloping Corwin and Symerton soils are on side slopes and ridgetops.

Most areas of this association are used for cultivated crops, but some of the acreage is used for pasture and hay. The less sloping soils are well suited to the cultivated crops commonly grown in the county. A few moderately sloping areas are moderately well suited to cultivated crops and well suited to pasture and hay. The main management needs are measures that control erosion on the Elliott and Varna soils, maintain or improve the drainage system in the Elliott and Ashkum soils, and maintain or improve tilth and fertility.

Nearly Level to Moderately Sloping Soils That Have a Very Slowly Permeable Subsoil; on Uplands

These soils are on till plains. They make up about 7 percent of the county. Most areas are used for cultivated crops. Seasonal wetness, water erosion, and low available moisture are the main management concerns.

8. Bryce-Swygert Association

Poorly drained and somewhat poorly drained soils that formed in silty material or clayey sediments and in the underlying clayey glacial till; on till plains and moraines

This association consists of nearly level to moderately sloping soils. Small depressional areas are common. Most areas are drained by ditches, small creeks, and drainageways. Slopes generally range from 0 to 7 percent.

This association makes up about 5 percent of the county. It is about 48 percent Bryce soils, 35 percent Swygert soils, and 17 percent minor soils.

The poorly drained Bryce soils are in broad, flat areas and in shallow depressions and drainageways below the Swygert soils. Typically, the surface soil is black, friable silty clay about 16 inches thick. The subsoil is silty clay about 39 inches thick. It is mottled. The upper part is dark grayish brown and olive gray and is firm; the next part is gray and very firm; and the lower part is gray, very firm, and calcareous. The underlying material to a depth of 60 inches or more is gray, mottled, very firm, calcareous silty clay.

The somewhat poorly drained Swygert soils are on slight rises or side slopes and ridgetops above the Bryce soils. Typically, the surface soil is black and very dark gray, friable silty clay loam about 14 inches thick. The subsoil is silty clay about 29 inches thick. It is mottled. The upper part is dark yellowish brown and firm; the next part is light olive brown and grayish brown, firm, and calcareous; and the lower part is grayish brown, very firm, and calcareous. The underlying material to a depth of 60 inches or more is grayish brown, mottled, very firm, calcareous silty clay.

Of minor extent in this association are Chatsworth, Mokena, Mona, and Rantoul soils. The moderately well drained, moderately sloping Chatsworth soils are on severely eroded side slopes. The somewhat poorly drained, nearly level Mokena soils are on slight rises.

The moderately well drained, gently sloping Mona soils are on side slopes and ridgetops. The very poorly drained, nearly level Rantoul soils are in depressions.

Most areas of this association are used for cultivated crops, but some of the acreage is used for pasture and hay. The less sloping soils are well suited to the cultivated crops grown in the county. A few moderately sloping areas are moderately well suited to cultivated crops and well suited to pasture and hay. The main management needs are measures that control erosion on the Swygert soils and that maintain or improve the drainage system, tilth, and fertility.

9. Clarence-Rowe Association

Somewhat poorly drained and poorly drained soils that formed in clayey glacial till or in clayey sediments and in the underlying clayey glacial till; on till plains and moraines

This association consists mainly of nearly level and gently sloping soils. Small depressional areas and steeper side slopes are common. Most areas are drained by ditches, small creeks, and drainageways. Slopes generally range from 0 to 6 percent.

This association makes up about 2 percent of the county. It is 32 percent Clarence soils, 31 percent Rowe soils, and 37 percent minor soils.

The somewhat poorly drained Clarence soils are on slight rises or on side slopes and ridgetops above the Rowe soils. Typically, the surface soil is very dark grayish brown, friable silty clay loam about 12 inches thick. The subsoil is silty clay about 26 inches thick. It is mottled. The upper part is dark grayish brown and firm; the next part is grayish brown and firm; and the lower part is grayish brown, very firm, and calcareous. The underlying material to a depth of 60 inches or more is mottled light olive brown and gray, very firm, calcareous silty clay.

The poorly drained Rowe soils are in broad, flat areas and in shallow depressions and drainageways below the Clarence soils. Typically, the surface layer is black, firm silty clay about 8 inches thick. The subsurface layer is very dark gray, mottled, firm silty clay about 6 inches thick. The subsoil is very firm silty clay about 30 inches thick. It is mottled. The upper part is dark grayish brown, and the lower part is gray and olive gray and is calcareous. The underlying material to a depth of 60 inches or more is gray, mottled, very firm, calcareous silty clay.

Of minor extent in this association are Chatsworth, Mokena, Mona, and Rantoul soils. The moderately well drained, moderately sloping Chatsworth soils are on severely eroded side slopes. The somewhat poorly drained, nearly level Mokena soils are on slight rises. The moderately well drained, gently sloping Mona soils are on side slopes and ridgetops. The very poorly drained, nearly level Rantoul soils are in depressions.

Most areas of this association are used for cultivated crops, but some of the acreage is used for pasture and hay. The soils are moderately well suited to the cultivated crops commonly grown in the county and to pasture and hay. The main management needs are measures that control erosion on the Clarence soils, measures that conserve moisture, and measures that maintain or improve the drainage system, tilth, and fertility.

Water Areas and Nearly Level to Very Steep Soils That Have a Moderately Permeable to Slowly Permeable Subsoil; on Uplands and Strip-Mined Land

These soils are on till plains and strip-mined land. They make up about 23 percent of the county. Most areas are used for cultivated crops, pasture and hay, or woodland. Some strip-mined areas are used for housing development or are idle land. Seasonal wetness and water erosion are the main management concerns.

10. Fincastle-Sabina-Strawn Association

Somewhat poorly drained and well drained soils that formed in loamy glacial till or in loess and in the underlying loamy glacial till; on till plains

This association consists of nearly level, gently sloping, and very steep soils. Some depressional areas and moderately sloping to steep areas are common. Most areas are drained by ditches, small creeks, and drainageways. Slopes generally range from 0 to 75 percent.

This association makes up about 13 percent of the county. It is about 21 percent Fincastle and similar soils, 19 percent Sabina and similar soils, 17 percent Strawn and similar soils, and 43 percent minor soils (fig. 6).

The somewhat poorly drained Fincastle soils are on slight rises and on side slopes and ridgetops above the Strawn soils. Typically, the surface soil is dark grayish brown, friable silt loam about 10 inches thick. The subsoil is about 39 inches thick. It is mottled. The upper part is dark brown and dark yellowish brown, friable silty clay loam; the next part is dark yellowish brown, friable silty clay loam; and the lower part is olive brown, friable, calcareous clay loam. The underlying material to a depth of 60 inches or more is light olive brown, mottled, firm, calcareous loam.

The somewhat poorly drained Sabina soils are on slight rises above the Strawn soils. Typically, the surface soil is dark grayish brown and grayish brown,

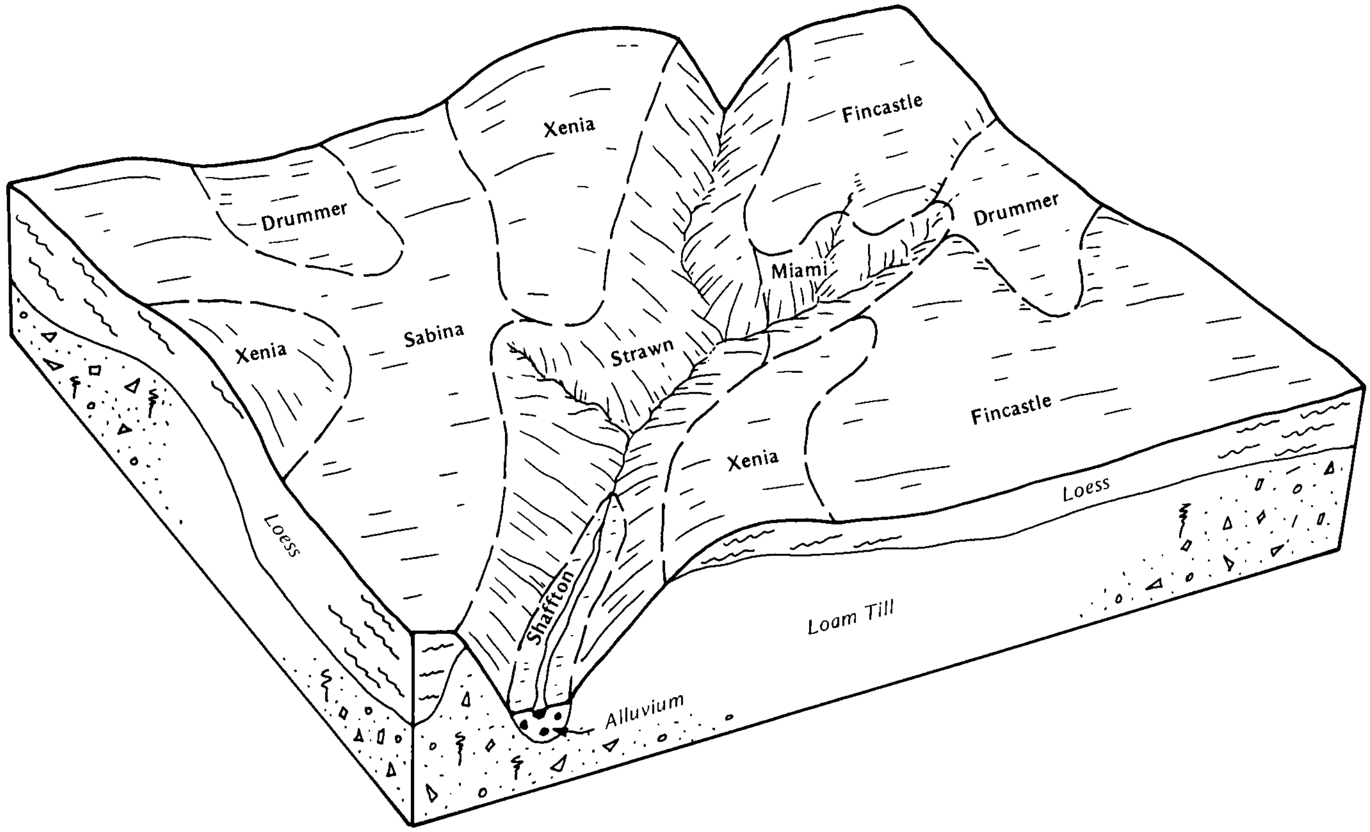


Figure 6.—Typical pattern of soils and parent material in the Fincastle-Sabina-Strawn association.

friable silt loam about 13 inches thick. The subsoil is about 45 inches thick. It is mottled. The upper part is brown, firm silty clay loam; the next part is yellowish brown, friable silty clay loam; and the lower part is light olive brown, firm, calcareous loam. The underlying material to a depth of 60 inches or more is light olive brown, mottled, firm, calcareous loam.

The well drained Strawn soils are on very steep side slopes below the Fincastle and Sabina soils. Typically, the surface soil is very dark grayish brown and brown, friable silt loam about 7 inches thick. The subsoil is about 11 inches thick. The upper part is brown, friable silty clay loam, and the lower part is brown, friable, calcareous loam. The underlying material to a depth of 60 inches or more is olive, firm, calcareous loam.

Of minor extent in this association are Drummer, Keomah, Miami, Shaffton, Starks, and Xenia soils. The poorly drained, nearly level Drummer soils are in shallow depressions and drainageways. The somewhat poorly drained, nearly level Keomah and Starks soils are on slight rises. The well drained, moderately sloping and steep Miami soils are on side slopes and ridgetops. The somewhat poorly drained Shaffton soils are on narrow flood plains. The moderately well drained, gently sloping Xenia soils are on side slopes and ridgetops.

Most areas of this association are used for cultivated crops, pasture and hay, or woodland. The less sloping soils are well suited to the cultivated crops commonly grown in the county and to pasture and hay. The very steep soils are unsuited to cultivated crops and to pasture and hay. They are moderately well suited to woodland. The main management needs are measures that control erosion, maintain or improve the drainage system in the Fincastle and Sabina soils, and maintain or improve tilth and fertility.

11. Blount-Morley-Ashkum Association

Poorly drained to well drained soils that formed in silty glacial till or in silty material and in the underlying silty glacial till; on till plains and moraines

This association consists of nearly level to very steep soils. Small depressional areas are common. Slopes generally range from 0 to 70 percent.

This association makes up about 8 percent of the county. It is about 46 percent Blount soils, 17 percent

Morley soils, 15 percent Ashkum soils, and 22 percent minor soils.

The somewhat poorly drained Blount soils are on slight rises and side slopes above the Ashkum soils and above or below the Morley soils. Typically, the surface layer is dark grayish brown, friable silt loam about 6 inches thick. The subsurface layer is light brownish gray, friable silt loam about 5 inches thick. The subsoil is about 29 inches thick. It is mottled. The upper part is brown, firm silty clay and silty clay loam; the next part is light olive brown, firm silty clay loam; and the lower part is light olive brown, firm, calcareous silty clay loam. The underlying material to a depth of 60 inches or more is grayish brown, mottled, very firm, calcareous silty clay loam.

The well drained and moderately well drained Morley soils are on side slopes and ridgetops above the Ashkum and Blount soils and on steep or very steep side slopes below the Ashkum and Blount soils. Typically, the surface layer is very dark grayish brown, friable silt loam about 5 inches thick. The subsurface layer is yellowish brown, friable silt loam about 4 inches thick. The subsoil is friable and firm silty clay loam about 36 inches thick. The upper part is yellowish brown and light olive brown, and the lower part is light olive brown and calcareous. The underlying material to a depth of 60 inches or more is light olive brown, calcareous silty clay loam.

The poorly drained Ashkum soils are in shallow depressions and drainageways below the Blount soils and below or above the Morley soils. Typically, the surface soil is black, friable silty clay loam about 18 inches thick. The subsoil is silty clay loam about 34 inches thick. The upper part is dark gray and friable, and the lower part is gray and light gray, mottled, and firm. The underlying material to a depth of 60 inches or more is light gray, mottled, firm, calcareous silty clay loam.

Of minor extent in this association are Martinsville and Whitaker soils. The well drained, gently sloping, moderately sloping, and steep Martinsville soils are on side slopes and ridgetops. The somewhat poorly drained, nearly level Whitaker soils are on slight rises.

Most areas of this association are used for cultivated crops, pasture and hay, or woodland. The less sloping soils are well suited or moderately well suited to the cultivated crops commonly grown in the county. They are well suited to pasture and hay. The steeper soils are poorly suited or unsuited to cultivated crops and to pasture and hay and are moderately well suited to woodland. The main management needs are measures that control erosion, maintain or improve the drainage system in the Ashkum and Blount soils, and maintain or improve tilth and fertility.

12. Lenzburg-Water Association

Well drained soils that formed in excavated surface-mined material, and areas of water; on strip-mined land

This association consists of areas of water and gently sloping and very steep soils. Slopes generally range from 1 to 70 percent.

This association makes up about 2 percent of the county. It is about 54 percent Lenzburg soils and 20 percent water (fig. 7).

The well drained Lenzburg soils are in nearly level areas and on ridgetops and side slopes above the areas of water. Typically, the surface layer is very dark grayish brown, friable loam about 2 inches thick. The upper part of the underlying material is dark grayish brown, mottled, firm, calcareous, mixed loam till and clay. The lower part to a depth of 60 inches or more is mixed dark grayish brown and light gray, mottled, firm, calcareous loam till and clay. Shale and coal channers are common throughout.

The water areas are in pits, trenches, and depressions on the strip-mined land.

Most areas of this association are used for building and construction sites or recreational areas or are idle land. The gently sloping soils are well suited to pasture and hay and to the cultivated crops commonly grown in the county. The very steep soils are unsuited to cultivated crops and to pasture and hay. They are moderately well suited to woodland. The main management needs are measures that control erosion and maintain or improve tilth and fertility.

Nearly Level Soils That Have a Moderately Rapidly Permeable or Moderately Permeable Subsoil; on Flood Plains

These soils make up about 4 percent of the county. Most areas are used for cultivated crops or woodland. Seasonal wetness, low available moisture, and flooding are the main management concerns.

13. Sawmill-Landes-Shaffton Association

Poorly drained, well drained, and somewhat poorly drained soils that formed in alluvium; on flood plains

This association consists of nearly level soils. Small depressional areas are common. Slopes generally range from 0 to 3 percent.

This association makes up about 4 percent of the county. It is about 22 percent Sawmill soils, 20 percent Landes soils, 18 percent Shaffton soils, and 40 percent minor soils (fig. 8).

The poorly drained Sawmill soils are on flood plains below the Landes and Shaffton soils. They are frequently flooded for brief periods from March through

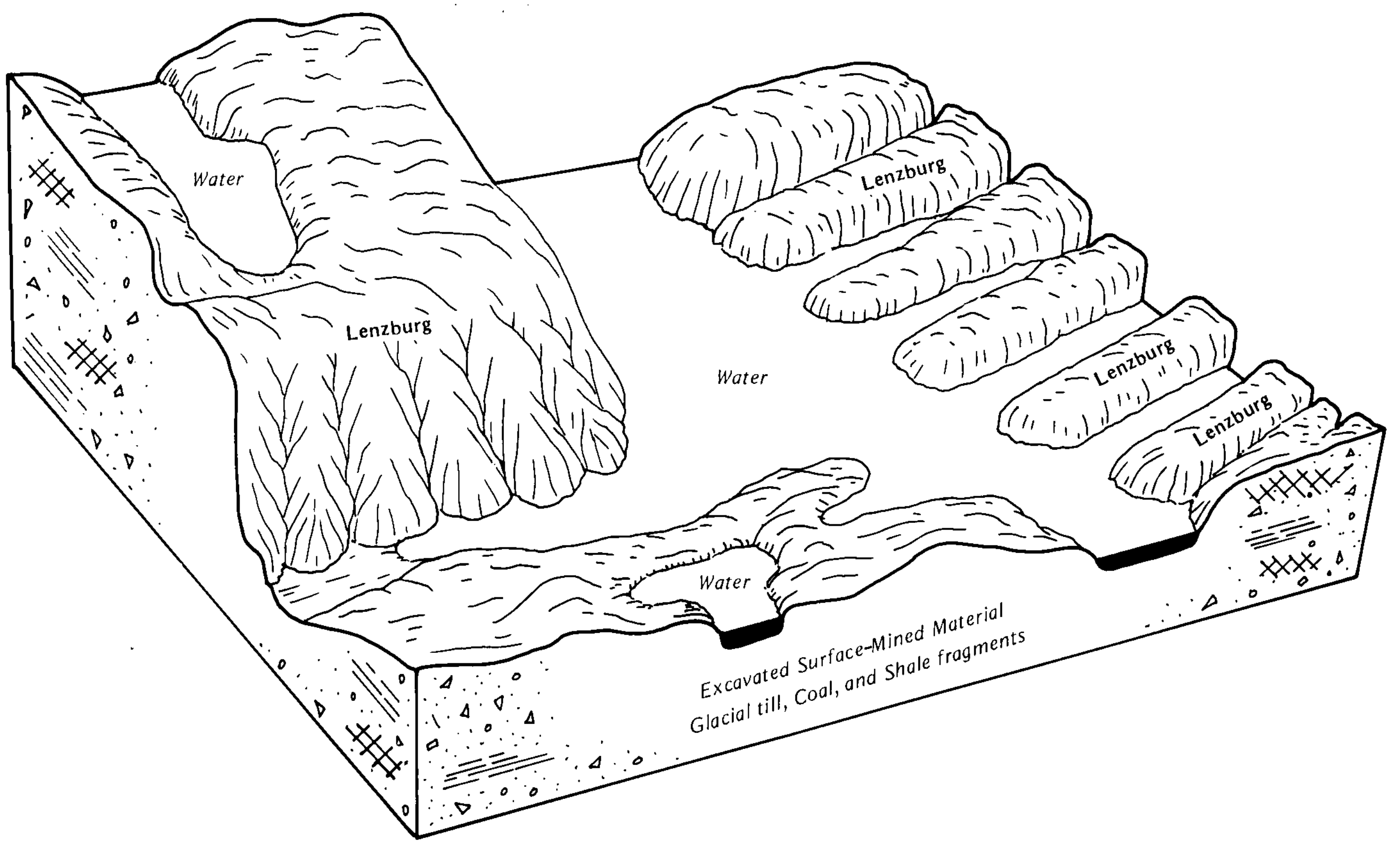


Figure 7.—Typical pattern of soils and parent material in the Lenzburg-Water association.

June. Typically, the surface layer is black, friable and firm silty clay loam about 16 inches thick. The subsurface layer is black, mottled, firm silty clay loam about 10 inches thick. The subsoil is about 29 inches thick. It is mottled. The upper part is grayish brown, firm silty clay loam, and the lower part is light brownish gray, friable silt loam. The underlying material to a depth of 60 inches or more is light brownish gray, mottled, friable silt loam.

The well drained Landes soils are on flood plains above the Shaffton and Sawmill soils. They are subject to occasional or rare flooding for brief periods from January through June. Typically, the surface layer is very dark gray, friable fine sandy loam about 6 inches thick. The subsurface layer is very dark grayish brown, friable fine sandy loam about 10 inches thick. The subsoil is about 21 inches thick. The upper part is dark brown, friable fine sandy loam, and the lower part is dark brown, friable loamy sand. The underlying material to a depth of 62 inches or more is brown and grayish brown, loose sand.

The somewhat poorly drained Shaffton soils are on flood plains above the Sawmill soils. They are frequently flooded for brief periods from January through April. Typically, the surface soil is black, friable loam about 13 inches thick. The subsoil is friable loam about 31 inches thick. It is mottled. The upper part is brown, the next part is mottled grayish brown and brown, and the lower part is grayish brown. The underlying material to a depth of 60 inches or more is grayish brown, mottled, friable, stratified loam, sandy loam, and loamy sand.

Of minor extent in this association are Ambraw, Raddle, Rossburg, and Ockley soils. The poorly drained, nearly level Ambraw soils and the well drained, nearly level Raddle and Rossburg soils are on flood plains. The well drained, nearly level Ockley soils are on stream terraces.

Most areas of this association are used for cultivated crops, but some of the acreage is used for pasture and hay or as woodland. The soils are well suited or moderately well suited to the cultivated crops commonly grown in the county and to pasture and hay. They are well suited to woodland. The main management needs

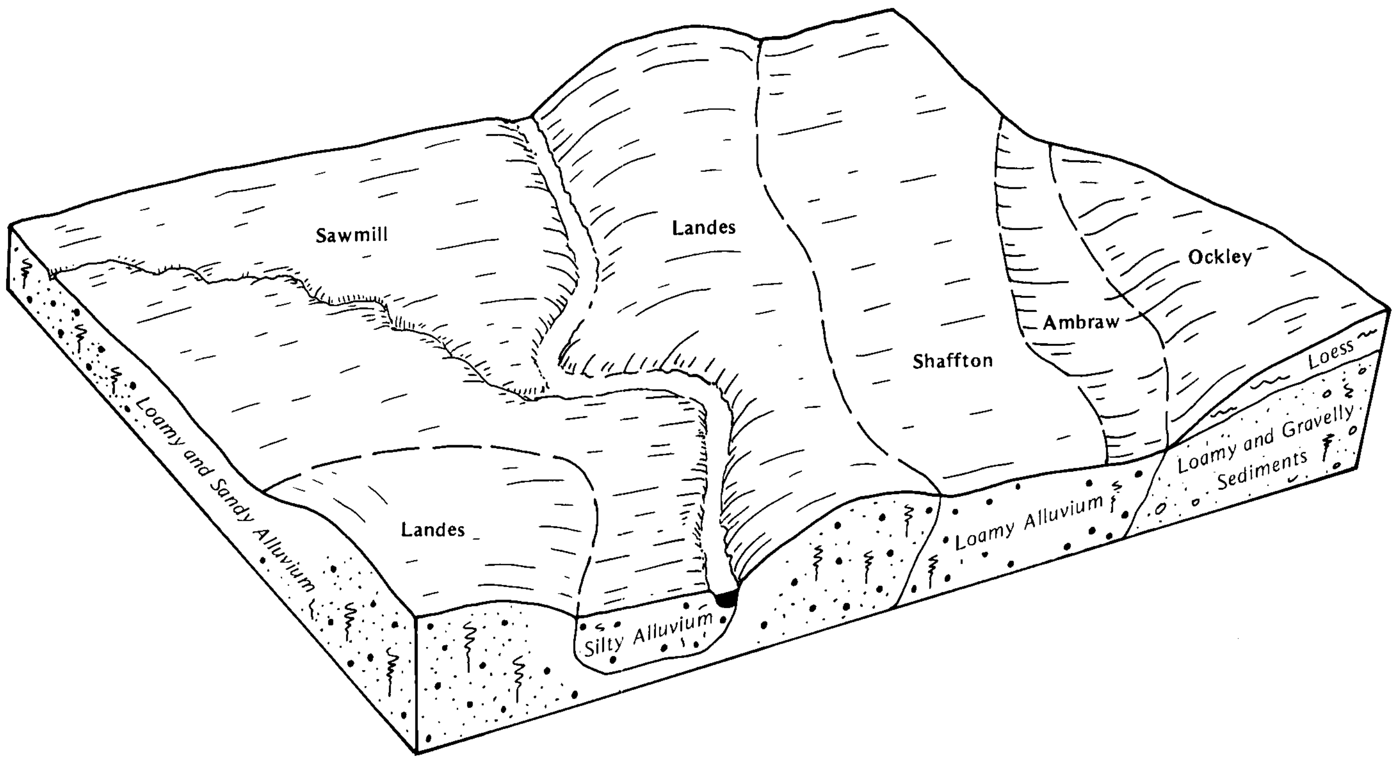


Figure 8.—Typical pattern of soils and parent material in the Sawmill-Landes-Shaffton association.

are measures that conserve moisture on the Landes soils, measures that maintain or improve the drainage system in the Sawmill soils, measures that control flooding, and measures that maintain tilth and fertility.

Broad Land Use Considerations

The soils in Vermilion County vary widely in their suitability for major land uses. Most of the acreage is used for cultivated crops, primarily corn and soybeans. The major soils generally are well suited to cultivated crops. A seasonal high water table and ponding are limitations in all of the associations, except for association 12. Erosion is a hazard in associations 5 to 12. A low available water capacity is a limitation in associations 9 and 13, and occasional or frequent flooding is a hazard in association 13.

A small acreage in the county is pastured, mainly in associations 10, 11, and 12. The less sloping soils in these associations are well suited or moderately well suited to grasses and legumes. Erosion is the main hazard. Pasture rotation and other measures that prevent overgrazing help to control erosion.

Some areas in the county are wooded, mainly in associations 10, 11, 12, and 13. The wooded areas are primarily adjacent to creeks and streams. The soils in these associations are well suited or moderately well suited to woodland. On some of the soils, the use of equipment is limited because of wetness or steep slopes. Using equipment only during the drier periods helps to overcome the wetness. Selective cutting and careful use of equipment help to overcome the slope.

Some areas in the county are used for urban development. Wetness, ponding, the shrink-swell potential, the slope, and restricted permeability are the major limitations. The soils in association 13 are generally unsuited to urban development because of flooding. At least some small areas of soils that are suited to urban development are available in each association.

The soils in the county range from well suited to unsuited to recreational development, depending on the intensity of the expected use. The slope and wetness are the major limitations. The soils in association 13 are generally unsuited to recreational development because of flooding. Some of the soils in each association are well suited or moderately well suited to some recreational uses, such as paths and trails for hiking and horseback riding.

The soils generally are well suited or moderately well suited to habitat for openland and woodland wildlife. The slope and wetness are the main limitations. Small, undrained depressional areas, mainly in associations 12 and 13, are well suited to habitat for wetland wildlife.

Detailed Soil Map Units

The map units on the detailed soil maps at the back of this survey represent the soils in the survey area. The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability and potential of a soil for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit, or soil, is given under the heading "Use and Management of the Soils."

Each map unit on the detailed soil maps represents an area on the landscape and consists of one or more soils for which the unit is named.

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

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

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Swygert silty clay loam, 0 to 2 percent slopes, is a phase of the Swygert series.

Some map units are made up of two or more major soils or are made up of one or more soils and a miscellaneous area. These map units are called soil complexes. The components of a *soil complex* occur in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the components are somewhat similar in all areas. Elliott-Urban land complex, 0 to 3 percent slopes, is an example.

Most map units include small scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major soil or soils. Such differences could significantly affect use and management of the soils in the map unit. The included soils are identified in each map unit description. Some small areas of strongly contrasting soils are identified by a special symbol on the soil maps.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Pits, gravel, is an example. Miscellaneous areas are shown on the soil maps. Some that are too small to be shown are identified by a special symbol on the soil maps.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of 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.

Soil Descriptions

17—Keomah silt loam. This nearly level, somewhat poorly drained soil is on slight rises on till plains and outwash plains. Individual areas are irregular in shape and range from 3 to 100 acres in size.

Typically, the surface layer is mixed dark grayish brown and light brownish gray, friable silt loam about 8 inches thick. The subsurface layer is light brownish gray, friable silt loam about 3 inches thick. The subsoil is about 31 inches thick. It is mottled. The upper part is yellowish brown, friable silt loam; the next part is yellowish brown, firm silty clay and silty clay loam; and the lower part is light olive brown, friable silt loam. The underlying material to a depth of 62 inches or more is light brownish gray, mottled, friable, calcareous silt loam. In places the surface layer is thicker and darker. In some areas the underlying material is stratified loam and sandy loam. In other areas the subsoil is thinner.

Included with this soil in mapping are small areas of the poorly drained Sable and moderately well drained Birkbeck soils. Birkbeck soils are on side slopes and ridgetops above the Keomah soil. Sable soils are in shallow depressions and drainageways below the

Keomah soil. Included soils make up 5 to 15 percent of the unit.

Water and air move through the Keomah soil at a slow or moderately slow rate. Surface runoff is slow in cultivated areas. A seasonal high water table is 2 to 4 feet below the surface during the spring and winter. Available water capacity is high. Organic matter content is moderately low. In cultivated areas the surface layer tends to crust and puddle after hard rains. The shrink-swell potential and the potential for frost action are high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to openland wildlife habitat. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

This soil is sufficiently drained for the commonly grown crops. Measures that maintain or improve the drainage system are needed. Tile drains and surface drains function satisfactorily if suitable outlets are available. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility and prevent surface crusting.

Pasture and hay plants grow well on this soil. Overgrazing or grazing when the soil is too wet, however, reduces forage production and causes surface compaction, excessive runoff, and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition. Leaving unmowed strips, 30 to 50 feet wide, at the edge of hayland provides excellent nesting cover for openland wildlife.

If this soil is used as a site for dwellings, the seasonal high water table and the shrink-swell potential are limitations. Installing underground drains around the foundations helps to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table and the restricted permeability are limitations. Underground drains help to lower the water table. Enlarging the absorption area helps to overcome the moderately slow absorption of liquid waste.

The land capability classification is IIw.

23A—Blount silt loam, 0 to 2 percent slopes. This nearly level, somewhat poorly drained soil is on slight rises on till plains and moraines. Individual areas are irregular in shape and range from 3 to 200 acres in size.

Typically, the surface layer is dark grayish brown, friable silt loam about 6 inches thick. The subsurface layer is light grayish brown, friable silt loam about 5 inches thick. The subsoil is about 29 inches thick. It is mottled. The upper part is brown, firm silty clay and silty clay loam; the next part is light olive brown, firm silty clay loam; and the lower part is light olive brown, firm, calcareous silty clay loam. The underlying material to a depth of 60 inches or more is grayish brown, mottled, very firm, calcareous silty clay loam. In places the surface layer is thicker and darker. In some areas the subsoil contains less clay and more silt. In other areas the subsoil and underlying material are stratified loam, sandy loam, and loamy sand.

Included with this soil in mapping are small areas of the poorly drained Ashkum and moderately well drained Morley soils. Ashkum soils are in shallow depressions and drainageways below the Blount soil. Morley soils are on side slopes and ridgetops above the Blount soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Blount soil at a slow or moderately slow rate. Surface runoff is slow in cultivated areas. The seasonal high water table is 1 to 3 feet below the surface during the spring. Available water capacity is moderate. Organic matter content also is moderate. In cultivated areas the surface layer tends to crust and puddle after hard rains. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to openland wildlife habitat. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

This soil is sufficiently drained for the commonly grown crops. Measures that maintain or improve the drainage system are needed. Tile drains and surface drains function satisfactorily if suitable outlets are available. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility and prevent surface crusting.

Pasture and hay plants grow well on this soil (fig. 9). Overgrazing or grazing when the soil is too wet, however, reduces forage production and causes surface compaction, excessive runoff, and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition. Leaving unmowed strips, 30 to 50 feet wide, at the edge of hayland provides excellent nesting cover for openland wildlife.

If this soil is used as a site for dwellings, the seasonal high water table and the shrink-swell potential are limitations. Installing underground drains around the foundations helps to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table and the restricted permeability are limitations. Underground drains help to lower the water table. Enlarging the absorption area

Figure 9.—Pasture in an area of Blount silt loam, 0 to 2 percent slopes.

helps to overcome the slow or moderately slow absorption of liquid waste.

The land capability classification is IIw.

23B2—Blount silt loam, 2 to 5 percent slopes, eroded. This gently sloping, somewhat poorly drained soil is on side slopes and ridgetops on till plains and moraines. Individual areas are irregular in shape and range from 3 to 200 acres in size.

Typically, the surface soil is dark grayish brown, friable silt loam about 4 inches thick. The subsoil is about 27 inches thick. It is mottled. The upper part is olive brown, friable silty clay loam; the next part is olive brown, firm silty clay; and the lower part is grayish brown, firm, calcareous silty clay loam. The underlying material to a depth of 60 inches or more is grayish brown, mottled, firm, calcareous silty clay loam (fig. 10). In some areas the surface layer is thicker and darker. In other areas the subsoil and underlying material are stratified loam and sandy loam. In a few places the subsoil contains less clay and more silt.

Included with this soil in mapping are small areas of the poorly drained Ashkum and moderately well drained Morley soils. Ashkum soils are in shallow depressions and drainageways below the Blount soil. Morley soils are on side slopes and ridgetops above the Blount soil. Included soils make up 2 to 8 percent of the unit.

Water and air move through the Blount soil at a slow or moderately slow rate. Surface runoff is medium in cultivated areas. The seasonal high water table is 1 to 3

Figure 10.—A profile of Blount silt loam, 2 to 5 percent slopes, eroded.

feet below the surface during the spring. Available water capacity is moderate. Organic matter content also is moderate. In cultivated areas, the surface layer tends to crust and puddle after hard rains. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to openland wildlife habitat. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

This soil is sufficiently drained for the commonly grown crops. Measures that maintain or improve the drainage system are needed. Tile drains and surface drains function satisfactorily if suitable outlets are available. In the areas used for corn, soybeans, or small grain, erosion is a hazard. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, or a combination of these. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility and prevent surface crusting.

Establishing pasture or hay plants on this soil helps to keep erosion within tolerable limits. Overgrazing or grazing when the soil is too wet, however, causes surface compaction, which results in poor tilth, reduced forage yields, and excessive runoff and increases the hazard of erosion. Proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to control erosion.

If this soil is used as a site for dwellings, the seasonal high water table and the shrink-swell potential are limitations. Installing underground drains around the foundations helps to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table and the restricted permeability are limitations. Underground drains help to lower the water table. Enlarging the absorption area helps to overcome the slow or moderately slow absorption of liquid waste.

The land capability classification is IIe.

27C3—Miami silt loam, 5 to 12 percent slopes, severely eroded. This moderately sloping, well drained soil is on side slopes and ridgetops on till plains and moraines. Individual areas are irregular in shape and range from 3 to 50 acres in size.

Typically, the surface soil is dark yellowish brown, friable silt loam about 4 inches thick. The subsoil is about 33 inches thick. It is mottled. The upper part is dark yellowish brown, firm clay loam; the next part is light olive brown, firm clay loam; and the lower part is light olive brown, firm, calcareous loam. The underlying material to a depth of 60 inches or more is light olive brown, firm, calcareous loam. In some areas the surface soil is thicker and darker. In other areas the subsoil contains less sand and more silt. In places the subsoil and underlying material are stratified loam and sandy loam.

Included with this soil in mapping are small areas of the poorly drained Drummer and somewhat poorly drained Sabina soils. Drummer soils are in shallow depressions and drainageways below the Miami soil. Sabina soils are on slight rises below the Miami soil or in nearly level areas above the Miami soil. Included soils make up 5 to 10 percent of the unit.

Water and air move through the Miami soil at a moderate or moderately slow rate. Surface runoff is medium in cultivated areas. Available water capacity is moderate. Organic matter content is low. In cultivated areas the surface layer tends to crust and puddle after hard rains. The potential for frost action and the shrink-swell potential are moderate.

Most areas are cultivated or are used for pasture and hay. This soil is well suited to pasture and hay, to habitat for woodland wildlife, and to woodland. It is moderately well suited to cultivated crops and to dwellings, septic tank absorption fields, and local roads and streets.

In the areas used for corn, soybeans, or small grain, further erosion is a hazard. A crop rotation that includes a forage crop, a system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, or a combination of these helps to keep soil loss at an acceptable level and thus maintains productivity. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility and prevent surface crusting.

Establishing pasture or hay plants on this soil helps to keep erosion within tolerable limits. Overgrazing, however, causes surface compaction, which results in poor tilth, reduced forage yields, and excessive runoff and increases the hazard of erosion. Proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to control erosion.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the moderately slow permeability is a limitation. Enlarging the absorption area helps to overcome the moderate or moderately slow absorption of liquid waste.

The land capability classification is IVe.

27F—Miami loam, 16 to 35 percent slopes. This steep, well drained soil is on side slopes in the uplands. Individual areas are long and narrow or irregularly shaped and range from 3 to 80 acres in size.

Typically, the surface layer is very dark grayish brown, friable loam about 4 inches thick. The subsurface layer is brown, friable loam about 4 inches thick. The subsoil is about 30 inches thick. The upper part is yellowish brown, friable loam; the next part is yellowish brown and dark yellowish brown, firm clay loam; and the lower part is dark yellowish brown, firm, calcareous clay loam. The underlying material to a depth of 60 inches or more is yellowish brown, firm, calcareous loam. In some areas, the subsoil is thinner and carbonates are closer to the surface. In other areas the soil contains less clay and more sand. A few areas are more sloping or are severely eroded.

Included with this soil in mapping are small areas of Landes soils and the moderately well drained Xenia soils. Landes soils are on flood plains below the Miami soil. Xenia soils are on side slopes and ridgetops above the Miami soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Miami soil at a moderate or moderately slow rate. Surface runoff is very rapid in wooded areas. Available water capacity is moderate. Organic matter content is moderately low. The shrink-swell potential and the potential for frost action are moderate.

Most areas are wooded. This soil is well suited to woodland wildlife habitat and is moderately well suited to woodland. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets and to pasture. It generally is unsuited to cultivated crops and hay because of the slope.

Establishing pasture or hay plants on this soil helps to keep erosion within tolerable limits. Overgrazing, however, causes surface compaction, which results in poor tilth, reduced forage yields, and excessive runoff and increases the hazard of erosion. Proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to control erosion.

If this soil is used as woodland, the erosion hazard and the equipment limitation are management concerns because of the slope. Plant competition is also a management concern. It affects seedlings of desirable species. Bare logging areas should be seeded to grass or to a grass-legume mixture. The use of machinery should be limited to periods when the soil is firm enough to support the equipment. In openings where timber has been harvested, competition from undesirable vegetation can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.

If this soil is used as a site for dwellings, the slope is a limitation. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling. Cutting and filling help to overcome the slope.

If this soil is used as a site for septic tank absorption fields, the slope and the moderately slow permeability are limitations. Enlarging the absorption area helps to overcome the moderately slow absorption of liquid waste. Installing the filter lines on the contour helps to evenly distribute the liquid waste.

The land capability classification is VIe.

43—Ipava silt loam. This nearly level, somewhat poorly drained soil is on slight rises on till plains and outwash plains. Individual areas are irregular in shape and range from 3 to more than 300 acres in size.

Typically, the surface soil is black and very dark gray, friable silt loam about 14 inches thick. The subsoil is silty clay loam about 32 inches thick. It is mottled. The upper part is brown and friable, and the lower part is brown and grayish brown and is firm. The underlying material to a depth of 60 inches or more is light brownish gray, mottled, firm, calcareous silt loam. In some areas the underlying material contains less silt and more sand. In other areas, the subsoil is thinner and the depth to calcareous silt loam is less than 40 inches. In a few areas the subsoil contains less clay and more silt.

Included with this soil in mapping are small areas of the poorly drained Sable soils. These soils are in broad, flat areas and in shallow depressions and drainageways below the Ipava soil. They make up 2 to 8 percent of the unit.

Water and air move through the Ipava soil at a moderately slow rate. Surface runoff is slow in cultivated areas. A seasonal high water table is 1 to 3 feet below the surface during the spring. Available water capacity and organic matter content are high. The shrink-swell potential and the potential for frost action also are high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to openland wildlife habitat. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

In the areas used for corn, soybeans, or small grain, a drainage system may be needed. Tile drains and surface drains function satisfactorily if suitable outlets are available. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

If this soil is used as a site for dwellings, the seasonal high water table and the shrink-swell potential are limitations. Installing underground drains around the foundations helps to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table and the moderately slow permeability are limitations. Underground drains help to lower the water table. Enlarging the absorption area helps to overcome the moderately slow absorption of liquid waste.

The land capability classification is I.

56B2—Dana silt loam, 2 to 5 percent slopes, eroded. This gently sloping, moderately well drained soil is on side slopes and ridgetops on till plains and moraines. Individual areas are irregular in shape and range from 3 to 80 acres in size.

Typically, the surface soil is very dark grayish brown, friable silt loam about 7 inches thick. The subsoil is about 40 inches thick. It is friable. The upper part is dark yellowish brown silty clay loam; the next part is dark yellowish brown, mottled clay loam; and the lower part is olive brown, mottled loam. The underlying material to a depth of 60 inches or more is olive brown, mottled, friable, calcareous loam. In places the surface soil is thicker. In some areas, the subsoil is thinner and calcareous loam is closer to the surface. In other areas the lower part of the subsoil and the underlying material are noncalcareous, stratified loam and sandy loam.

Included with this soil in mapping are small areas of the poorly drained Drummer and somewhat poorly drained Raub soils. Drummer soils are in broad, flat areas and in shallow depressions and drainageways below the Dana soil. Raub soils are on slight rises below the Dana soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Dana soil at a moderately slow rate. Surface runoff is medium in cultivated areas. A seasonal high water table is 3 to 6 feet below the surface during the spring. Available water capacity is high. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to openland wildlife habitat. It is moderately well suited to dwellings and is poorly suited to septic tank absorption fields and local roads and streets.

In the areas used for corn, soybeans, or small grain, erosion is a hazard. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, or a combination of these.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. Also, the wetness is a limitation on sites for dwellings with basements. Installing underground drains around the foundations helps to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table and the moderately slow permeability are limitations. The septic system functions properly only if the water table is lowered or the distribution lines are installed closer to the surface than is typical. Enlarging the absorption field helps to overcome the moderately slow absorption of liquid waste.

The land capability classification is IIe.

59—Lisbon silt loam. This nearly level, somewhat poorly drained soil is on slight rises on till plains and moraines. Individual areas are irregular in shape and range from 3 to 100 acres in size.

Typically, the surface soil is very dark gray, friable silt loam about 11 inches thick. The subsoil is about 28 inches thick. It is mottled. The upper part is dark brown and dark grayish brown, friable silty clay loam; the next part is grayish brown, friable clay loam; and the lower part is grayish brown, friable, calcareous clay loam. The underlying material to a depth of 60 inches or more is light brownish gray, mottled, firm, calcareous loam. In some places the subsoil is thicker. In other places the upper part of the subsoil contains less silt and more sand or more clay. In some areas the underlying material is stratified loam and sandy loam. In the area between Danville and Bismarck, the underlying material is calcareous silty clay loam.

Included with this soil in mapping are small areas of the moderately well drained Corwin and Saybrook soils and the poorly drained Milford soils. Corwin and Saybrook soils are on side slopes and ridgetops above the Lisbon soil. Milford soils are in broad, flat areas and in shallow depressions and drainageways below the Lisbon soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Lisbon soil at a moderately slow rate. Surface runoff is slow in cultivated areas. A seasonal high water table is 1 to 3 feet below the surface during the spring. Available water capacity is high. Organic matter content also is high. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to openland wildlife habitat. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

In the areas used for corn, soybeans, or small grain, a drainage system may be needed. Tile drains and surface drains function satisfactorily if suitable outlets are available. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

If this soil is used as a site for dwellings or septic tank absorption fields, the seasonal high water table is a limitation. The moderately slow permeability is an additional limitation on sites for septic tank absorption fields. Underground drains help to lower the water table. Enlarging the absorption area helps to overcome the moderately slow absorption of liquid waste.

The land capability classification is I.

67—Harpster silty clay loam. This nearly level, poorly drained soil is in broad, flat areas and in shallow depressions on till plains and outwash plains. It is occasionally ponded for brief periods in the winter and spring. Individual areas are irregular in shape and range from 3 to 80 acres in size.

Typically, the surface soil is black, friable, calcareous silty clay loam about 12 inches thick. The subsoil is about 29 inches thick. It is calcareous. The upper part is dark gray, friable silty clay loam; the next part is dark gray and gray, mottled, firm silty clay loam; and the lower part is light gray, mottled, friable silt loam. The underlying material to a depth of 60 inches or more is light gray, mottled, friable, calcareous silt loam. In some areas the surface layer does not have carbonates. In other areas the subsoil contains more sand.

Included with this soil in mapping are small areas of the somewhat poorly drained Brenton and Flanagan soils. These soils are on slight rises above the Harpster soil. They make up 2 to 10 percent of the unit.

Water and air move through the Harpster soil at a moderate rate. Surface runoff is slow to ponded in cultivated areas. A seasonal high water table is 0.5 foot above to 2.0 feet below the surface during the spring. Available water capacity is high. Organic matter content also is high. The surface layer becomes compacted and cloddy if it is tilled when wet. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops. It is moderately well suited to pasture and hay and to openland wildlife habitat. It is poorly suited to dwellings, local roads and streets, and septic tank absorption fields.

This soil is sufficiently drained for the commonly grown crops. Measures that maintain or improve the drainage system are needed. Tile drains and surface drains function satisfactorily if suitable outlets are available. No applications of lime are needed. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

If this soil is used as a site for dwellings, the ponding and the shrink-swell potential are management concerns. Underground drains help to lower the water table, and surface drains help to control the ponding. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the ponding and the moderate permeability are management concerns. A drainage system is needed. Also, adding as much as 2 feet of loamy fill material increases the depth to the seasonal high water table. Enlarging the absorption area helps to overcome the moderate absorption of liquid waste.

The land capability classification is IIw.

68—Sable silty clay loam. This nearly level, poorly drained soil is in broad, flat areas and in shallow depressions and drainageways on till plains and outwash plains. It is occasionally ponded for brief periods in the winter and spring. Individual areas are irregular in shape and range from 3 to more than 2,000 acres in size.

Typically, the surface soil is black, friable silty clay loam about 14 inches thick. The subsoil is about 34 inches thick. It is dark gray and gray, mottled, firm silty clay loam. The underlying material to a depth of 70 inches or more is light olive gray, mottled, firm, calcareous silt loam. In a few places the surface soil is thicker and contains less clay. In some areas the underlying material contains more sand. In a few areas the subsoil is calcareous.

Included with this soil in mapping are small areas of the somewhat poorly drained Keomah and Ipava soils on slight rises above the Sable soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Sable soil at a moderate rate. Surface runoff is slow to ponded in cultivated areas. A seasonal high water table is 0.5 foot above to 2.0 feet below the surface during the spring. Available water capacity is high. Organic matter content also is high. The surface layer becomes compacted and cloddy if it is tilled when wet. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops and to openland wildlife habitat. It is moderately well suited to pasture and hay. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

This soil is sufficiently drained for the commonly grown crops. Measures that maintain or improve the drainage system are needed. Tile drains and surface drains function satisfactorily if suitable outlets are available. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

If this soil is used as a site for dwellings, the ponding and the shrink-swell potential are management concerns. Underground drains help to lower the water table, and surface drains help to control the ponding. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the ponding and the moderate permeability are management concerns. A drainage system is needed. Also, adding as much as 2 feet of loamy fill material increases the depth to the seasonal high water table. Enlarging the absorption area helps to overcome the moderate absorption of liquid waste.

The land capability classification is IIw.

69—Milford silty clay loam. This nearly level, poorly drained soil is in broad, flat areas and in shallow depressions and drainageways on uplands. It is occasionally ponded for brief periods in the winter and spring. Individual areas are irregular in shape and range from 3 to more than 500 acres in size.

Typically, the surface soil is black and very dark gray, friable silty clay loam about 18 inches thick. The subsoil is about 34 inches thick. It is mottled. The upper part is dark grayish brown, firm silty clay loam, and the lower part is gray, friable silty clay loam that has strata of clay loam. The underlying material to a depth of 60 inches or more is mottled gray and light olive brown, friable, stratified silty clay loam, clay loam, and loam. In some areas the underlying material is firm, calcareous silty clay loam. In a few places the surface soil is thicker. In some places the subsoil contains less clay and more silt or sand.

Included with this soil in mapping are small areas of the somewhat poorly drained Elliott and Lisbon soils and the moderately well drained Corwin soils. Elliott and Lisbon soils are on slight rises above the Milford soil. Corwin soils are on ridgetops and side slopes above the Milford soil. Included soils make up 2 to 8 percent of the unit.

Water and air move through the Milford soil at a moderately slow rate. Surface runoff is slow to ponded in cultivated areas. A seasonal high water table is 0.5 foot above to 2.0 feet below the surface during the spring. Available water capacity is very high. Organic matter content is high. The surface layer becomes compacted and cloddy if it is tilled when wet. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops and to openland wildlife habitat. It is moderately well suited to pasture and hay. It is poorly suited to dwellings, local roads and streets, and septic tank absorption fields.

This soil is sufficiently drained for the commonly grown crops. Measures that maintain or improve the drainage system are needed. Tile drains and surface drains function satisfactorily if suitable outlets are available. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

If this soil is used as a site for dwellings, the ponding and the shrink-swell potential are management concerns. Underground drains help to lower the water table, and surface drains help to control the ponding. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the ponding and the moderately slow permeability are management concerns. A drainage system is needed. Also, adding as much as 2 feet of loamy fill material increases the depth to the seasonal high water table. Enlarging the absorption area helps to overcome the moderately slow absorption of liquid waste.

The land capability classification is IIw.

88B—Sparta loamy fine sand, 1 to 6 percent slopes. This gently sloping, excessively drained soil is on side slopes and ridgetops in the uplands. Individual areas are irregularly shaped or long and narrow and range from 3 to 40 acres in size.

Typically, the surface soil is very dark grayish brown, very friable loamy fine sand about 11 inches thick. The subsoil is about 26 inches thick. It is very friable. The upper part is brown loamy fine sand, and the lower part is dark yellowish brown and yellowish brown fine sand. The underlying material to a depth of 60 inches or more is yellowish brown, loose fine sand. In some areas the surface layer is thinner or lighter in color. In a few areas the subsoil contains less sand and more clay or silt. In a few places the slope is more than 6 percent.

Included with this soil in mapping are small areas of the somewhat poorly drained Andres and La Hogue soils and the poorly drained Ashkum and Selma soils. Andres and La Hogue soils are on slight rises below the Sparta soil. Ashkum and Selma soils are in broad, flat areas and in shallow depressions and drainageways below the Sparta soil. Included soils make up 5 to 10 percent of the unit.

Water and air move through the Sparta soil at a rapid rate. Surface runoff is slow in cultivated areas. Available water capacity is low. Organic matter content is moderately low.

Most areas are cultivated. This soil is well suited to dwellings and local roads and streets. It is moderately well suited to pasture and hay and to openland wildlife habitat. It is poorly suited to septic tank absorption fields and to cultivated crops.

In areas used for corn, soybeans, or small grain, droughtiness and soil blowing are hazards. Establishing field windbreaks, keeping tillage at a minimum, and returning crop residue to the soil help to control soil blowing, improve tilth and fertility, and conserve soil moisture.

If this soil is used as a site for septic tank absorption fields, a poor filtering capacity is a limitation. The soil readily absorbs but does not adequately filter the effluent. The poor filtering capacity may result in the contamination of ground water. The septic tank system functions satisfactorily if a sealed sand filter and a disinfection tank are installed.

The land capability classification is IVs.

91A—Swygert silty clay loam, 0 to 2 percent slopes. This nearly level, somewhat poorly drained soil is on slight rises on till plains and moraines. Individual areas are irregular in shape and range from 3 to more than 100 acres in size.

Typically, the surface soil is black and very dark gray, friable silty clay loam about 14 inches thick. The subsoil is silty clay about 29 inches thick. It is mottled. The upper part is dark yellowish brown and is firm, the next part is light olive brown and grayish brown and is firm and calcareous, and the lower part is grayish brown and is very firm and calcareous. The underlying material to a depth of 60 inches or more is grayish brown, mottled, very firm, calcareous silty clay. In some places the surface layer is thinner. In other places, the subsoil is thinner and very firm, calcareous silty clay is closer to the surface. In some small areas the slope is more than 2 percent. In some places the surface soil and the subsoil contain more sand and less clay.

Included with this soil in mapping are small areas of the poorly drained Bryce soils and the moderately well drained Chatsworth and Mona soils. Bryce soils are in broad, flat areas and in shallow depressions and drainageways below the Swygert soil. Chatsworth and Mona soils are on side slopes and ridgetops above the Swygert soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Swygert soil at a very slow rate. Surface runoff is slow in cultivated areas. A seasonal high water table is 1 to 3 feet below the surface in the spring. Available water capacity is low. Organic matter content is high. The surface layer becomes compacted and cloddy if it is tilled when wet. The shrink-swell potential and the potential for frost action are high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to openland wildlife habitat. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

In the areas used for corn, soybeans, or small grain, a drainage system may be needed. Surface drains function satisfactorily if suitable outlets are available. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

If this soil is used as a site for dwellings, the seasonal high water table and the shrink-swell potential are limitations. Installing underground drains around the foundations helps to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table and the very slow permeability are limitations. Underground drains help to lower the water table. Enlarging the absorption area helps to overcome the very slow absorption of liquid waste.

The land capability classification is IIw.

91B2—Swygert silty clay loam, 2 to 5 percent slopes, eroded. This gently sloping, somewhat poorly drained soil is on side slopes and ridgetops on till plains and moraines. Individual areas are irregular in shape and range from 3 to 200 acres in size.

Typically, the surface soil is very dark gray, friable silty clay loam about 8 inches thick. The subsoil is about 29 inches thick. It is mottled, very firm silty clay. The upper part is olive brown, and the lower part is grayish brown and gray and is calcareous. The underlying material to a depth of 60 inches or more is gray and olive, mottled, very firm, calcareous silty clay. In some areas the surface layer is thicker. In other areas, the subsoil is thinner and calcareous silty clay is closer to the surface. In a few areas the surface soil and the subsoil contain more sand and less clay.

Included with this soil in mapping are small areas of the poorly drained Bryce and moderately well drained Mona soils. Bryce soils are in broad, flat areas and in shallow depressions and drainageways below the Swygert soil. Mona soils are on side slopes and ridgetops above the Swygert soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Swygert soil at a very slow rate. Surface runoff is medium in cultivated areas. A seasonal high water table is 1 to 3 feet below the surface during the spring. Available water capacity is low. Organic matter content is moderate. The surface layer becomes compacted and cloddy if it is tilled when wet. The shrink-swell potential and the potential for frost action are high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to openland wildlife habitat. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

In the areas used for corn, soybeans, or small grain, erosion is a hazard and wetness is a limitation. Erosion can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, or a combination of these. A drainage system may be needed. Surface drains function satisfactorily if suitable outlets are available. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

If this soil is used as a site for dwellings, the seasonal high water table and the shrink-swell potential are limitations. Installing underground drains around the foundations helps to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table and the very slow permeability are limitations. Underground drains help to lower the water table. Enlarging the absorption area helps to overcome the very slow absorption of liquid waste.

The land capability classification is IIe.

91C2—Swygert silty clay loam, 5 to 7 percent slopes, eroded. This moderately sloping, somewhat poorly drained soil is on side slopes and ridgetops on till plains and moraines. Individual areas are irregular in shape and range from 3 to 20 acres in size.

Typically, the surface soil is very dark grayish brown, friable silty clay loam about 7 inches thick. The subsoil is silty clay about 29 inches thick. It is mottled. The upper part is olive brown and grayish brown and is firm, and the lower part is olive gray and gray and is very firm and calcareous. The underlying material extends to a depth of 60 inches or more. It is gray, mottled, very firm, calcareous silty clay. In some areas the soil is severely eroded. In other areas, the subsoil is thicker and the depth to calcareous silty clay is greater. In a few areas the subsoil contains less clay and more sand or silt.

Included with this soil in mapping are small areas of the poorly drained Bryce and moderately well drained Mona soils. Bryce soils are in broad, flat areas and in shallow depressions and drainageways below the Swygert soil. Mona soils are on side slopes and ridgetops above or below the Swygert soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Swygert soil at a very slow rate. Surface runoff is medium in cultivated areas. A seasonal high water table is 1 to 3 feet below the surface during the spring. Available water capacity is low. Organic matter content is moderate. The surface layer becomes compacted and cloddy if it is tilled when wet. The shrink-swell potential and the potential for frost action are high.

Most areas are cultivated. This soil is well suited to pasture and hay and to openland wildlife habitat. It is moderately well suited to cultivated crops. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

In the areas used for corn, soybeans, or small grain, further erosion is a hazard and wetness is a limitation. A crop rotation that includes a forage crop, a system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, or a combination of these helps to keep soil loss at an acceptable level and thus maintains productivity. A drainage system may be needed. Surface drains function satisfactorily if suitable outlets are available. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

If this soil is used as a site for dwellings, the seasonal high water table and the shrink-swell potential are limitations. Installing underground drains around the foundations helps to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table and the very slow permeability are limitations. Underground drains help to lower the water table. Enlarging the absorption area helps to overcome the very slow absorption of liquid waste.

The land capability classification is IIIe.

102—La Hogue loam. This nearly level, somewhat poorly drained soil is on slight rises on outwash plains and stream terraces. Individual areas are irregular in shape and range from 3 to 150 acres in size.

Typically, the surface soil is very dark gray, friable loam about 12 inches thick. The subsoil is about 31 inches thick. It is mottled. The upper part is brown, friable loam; the next part is dark yellowish brown, friable clay loam; and the lower part is brown, friable clay loam and stratified loamy coarse sand to clay loam. The underlying material to a depth of 60 inches or more is brown, mottled, friable, stratified loamy coarse sand to clay loam. In places the underlying material is firm, calcareous loam. In some areas the subsoil is gravelly sand and loamy sand. In other areas the upper part of the subsoil contains more clay and less sand. In a few areas the subsoil is thinner.

Included with this soil in mapping are small areas of the poorly drained Drummer and Selma soils, the well drained Jasper soils, and the moderately well drained Proctor soils. Drummer and Selma soils are in broad, flat areas and in shallow depressions and drainageways below the La Hogue soil. Jasper and Proctor soils are on slight rises and on side slopes and ridgetops above the La Hogue soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the La Hogue soil at a moderate rate. Surface runoff is slow in cultivated areas. A seasonal high water table is 1 to 3 feet below the surface during the spring. Available water capacity is high. Organic matter content also is high. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to openland wildlife habitat. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

In the areas used for corn, soybeans, or small grain, a drainage system may be needed. Tile drains and surface drains function satisfactorily if suitable outlets are available. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

If this soil is used as a site for dwellings, the seasonal high water table and the shrink-swell potential are limitations. Installing underground drains around the foundations helps to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table and the moderate permeability are limitations. Underground drains help to lower the water table. Enlarging the absorption area helps to overcome the moderate absorption of liquid waste.

The land capability classification is I.

107—Sawmill silty clay loam. This nearly level, poorly drained soil is on flood plains. It is frequently flooded for brief periods from March through June. Individual areas are long and narrow or irregularly shaped and range from 3 to more than 100 acres in size.

Typically, the surface layer is black, friable and firm silty clay loam about 16 inches thick. The subsurface layer is black, mottled, firm silty clay loam about 10 inches thick. The subsoil is about 29 inches thick. It is mottled. The upper part is grayish brown, firm silty clay loam, and the lower part is light brownish gray, friable silt loam. The underlying material to a depth of 60 inches or more is light brownish gray, mottled, friable silt loam. In places the surface layer and subsurface layer are thinner. In some areas the soil contains less silt and more clay or sand. A few areas are only rarely flooded.

Included with this soil in mapping are small areas of the well drained Landes soils. These soils are on flood plains above the Sawmill soil. They make up 2 to 8 percent of the unit.

Water and air move through the Sawmill soil at a moderate rate. Surface runoff is very slow in cultivated areas. A seasonal high water table is at the surface to 2 feet below the surface during the spring. Available water capacity is high. Organic matter content also is high. The surface layer becomes compacted and cloddy if it is tilled when wet. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops and to woodland. It is moderately well suited to pasture and hay and to woodland wildlife habitat. It is poorly suited to local roads and streets. It generally is unsuited to dwellings and septic tank absorption fields because of the flooding.

This soil is sufficiently drained for the commonly grown crops. Measures that maintain or improve the drainage system are needed. Tile drains and surface drains function satisfactorily if suitable outlets are available. The spring flooding frequently delays planting and damages crops. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

If this soil is used for pasture and hay, measures that control flooding are needed. Overgrazing or grazing when the soil is too wet reduces forage production and causes surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition.

If this soil is used as woodland, the equipment limitation, seedling mortality, and windthrow are management concerns because of the flooding, wetness, and a high content of clay in the surface soil. Plant competition is also a management concern. It affects seedlings of desirable species. The use of equipment should be limited to periods when the soil is firm enough to support the equipment. The seedling mortality rate can be reduced by providing protection from flooding and by planting species that will tolerate excessive moisture and poor tilth. Planting on ridges also helps to overcome the wetness. Harvesting methods that do not leave the remaining trees isolated or widely spaced can reduce the windthrow hazard. In openings where timber has been harvested, competition from undesirable vegetation can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.

The land capability classification is IIIw.

125—Selma silt loam. This nearly level, poorly drained soil is in broad, flat areas and in shallow depressions and drainageways on outwash plains. It is occasionally ponded for brief periods in the winter and spring. Individual areas are irregular in shape and range from 3 to 500 acres in size.

Typically, the surface soil is black, friable silt loam and loam about 22 inches thick. The subsoil is about 21 inches thick. It is friable. The upper part is dark gray loam; the next part is olive gray, mottled loam; and the lower part is light gray, mottled clay loam and loam. The underlying material to a depth of 60 inches or more is light gray, mottled sandy loam. In some areas the surface soil and the subsoil contain less sand and more silt. In a few areas the underlying material is calcareous silty clay loam or loamy till.

Included with this soil in mapping are small areas of the somewhat poorly drained Brenton and La Hogue soils and the well drained Jasper soils. Brenton and La Hogue soils are on slight rises above the Selma soil. Jasper soils are on slight rises, side slopes, and ridgetops above the Selma soil. Included soils make up 2 to 8 percent of the unit.

Water and air move through the Selma soil at a moderate rate. Surface runoff is slow to ponded in cultivated areas. A seasonal high water table is 0.5 foot above to 2.0 feet below the surface during the spring. Available water capacity is high. Organic matter content also is high. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops. It is moderately well suited to habitat for openland wildlife and to pasture and hay. It is poorly suited to dwellings, local roads and streets, and septic tank absorption fields.

This soil is sufficiently drained for the commonly grown crops. Measures that maintain or improve the drainage system are needed. Tile drains and surface drains function satisfactorily if suitable outlets are available. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

If this soil is used as a site for dwellings, the ponding and the shrink-swell potential are management concerns. Underground drains help to lower the water table, and surface drains help to control the ponding. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the ponding and the moderate permeability are management concerns. A drainage system is needed. Also, adding as much as 2 feet of loamy fill material increases the depth to the seasonal high water table. Enlarging the absorption area helps to overcome the moderate absorption of liquid waste.

The land capability classification is IIw.

131B—Alvin fine sandy loam, 1 to 5 percent slopes. This gently sloping, well drained soil is on side slopes and ridgetops on outwash plains and stream terraces. Individual areas are irregular in shape and range from 3 to 25 acres in size.

Typically, the surface soil is dark brown, very friable fine sandy loam about 8 inches thick. The subsoil is about 46 inches thick. The upper part is dark yellowish brown, very friable fine sandy loam; the next part is dark yellowish brown, friable fine sandy loam; and the lower part is dark yellowish brown and stratified dark yellowish brown and yellowish brown, very friable, stratified loamy fine sand and fine sandy loam. The underlying material to a depth of 60 inches or more is stratified dark yellowish brown and yellowish brown, very friable, stratified fine sandy loam, loamy fine sand, and loam. In some areas the surface layer is darker. In other areas the subsoil contains more silt or clay and less sand. In a few areas the underlying material is sand and gravel.

Included with this soil in mapping are small areas of the poorly drained Ashkum and somewhat poorly drained Whitaker soils. Ashkum soils are in shallow depressions and drainageways below the Alvin soil. Whitaker soils are on slight rises below the Alvin soil. Included soils make up 5 to 15 percent of the unit.

Water and air move through the Alvin soil at a moderate rate. Surface runoff is slow in cultivated areas. Available water capacity is moderate. Organic matter content is moderately low. The potential for frost action is moderate.

Most areas are cultivated. This soil is well suited to cultivated crops, to openland wildlife habitat, and to pasture and hay. It also is well suited to dwellings and septic tank absorption fields. It is moderately well suited to local roads and streets.

In the areas used for corn, soybeans, or small grain, soil blowing and water erosion are hazards. Water erosion can be controlled by terraces, contour farming, a system of conservation tillage that leaves crop residue on the surface after planting, or a combination of these. Field windbreaks and a protective cover of crop residue help to prevent soil blowing.

Establishing hay or pasture plants on this soil helps to keep erosion within tolerable limits. Overgrazing, however, reduces forage yields and causes surface compaction, which results in excessive runoff and poor tilth and increases the hazard of erosion. Proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to control erosion. Leaving unmowed strips, 30 to 50 feet wide, at the edge of hayland provides excellent nesting cover for openland wildlife.

The land capability classification is IIe.

132—Starks silt loam. This nearly level, somewhat poorly drained soil is on slight rises on outwash plains and stream terraces. Individual areas are irregular in shape and range from 5 to more than 200 acres in size.

Typically, the surface layer is dark grayish brown, friable silt loam about 7 inches thick. The subsurface layer is grayish brown, friable silt loam about 5 inches thick. The subsoil is about 35 inches thick. It is mottled. The upper part is brown, friable silty clay loam; the next part is mottled grayish brown and yellowish brown, friable clay loam; and the lower part is mottled grayish brown and yellowish brown, friable, stratified loam, clay loam, and silty clay loam. The underlying material to a depth of 60 inches or more is yellowish brown, mottled, friable, calcareous, stratified sandy clay to sand. In places the surface layer is thicker and darker. In a few areas the underlying material is calcareous, loamy glacial till. In other areas the subsoil contains more sand and less silt.

Included with this soil in mapping are small areas of the well drained Camden and Martinsville soils and the poorly drained Drummer soils. Camden and Martinsville soils are on side slopes and ridgetops above the Starks soil. Drummer soils are in shallow depressions and drainageways below the Starks soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Starks soil at a moderate rate. Surface runoff is slow in cultivated areas. A seasonal high water table is 1 to 3 feet below the surface during the spring. Available water capacity is high. Organic matter content is moderately low. In cultivated areas the surface layer tends to crust and puddle after hard rains. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to openland wildlife habitat. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

This soil is sufficiently drained for the commonly grown crops. Measures that maintain or improve the drainage system are needed. Tile drains and surface drains function satisfactorily if suitable outlets are available. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility and prevent surface crusting.

Hay and pasture plants grow well on this soil. Overgrazing or grazing when the soil is too wet, however, reduces forage production and causes surface compaction, excessive runoff, and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition. Leaving unmowed strips, 30 to 50 feet wide, at the edge of hayland provides excellent nesting cover for openland wildlife.

If this soil is used as a site for dwellings, the seasonal high water table and the shrink-swell potential are limitations. Installing underground drains around the foundations helps to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table and the moderate permeability are limitations. Underground drains help to lower the water table. Enlarging the absorption area helps to overcome the moderate absorption of liquid waste.

The land capability classification is IIw.

134B—Camden silt loam, 1 to 5 percent slopes. This gently sloping, well drained soil is on side slopes and ridgetops on outwash plains and stream terraces. Individual areas are irregular in shape and range from 3 to 50 acres in size.

Typically, the surface layer is brown, friable silt loam about 4 inches thick. The subsurface layer is dark brown, friable silt loam about 6 inches thick. The subsoil is about 40 inches thick. It is friable. The upper part is dark yellowish brown silt loam and silty clay loam, and the lower part is yellowish brown silty clay loam, clay loam, and sandy clay loam. The underlying material to a depth of 60 inches or more is yellowish brown, very friable sandy loam that has strata of sand and loamy sand. In places the surface soil is thicker and darker. In some areas the underlying material is firm, calcareous loam. In other areas the upper part of the subsoil contains less silt and more sand.

Included with this soil in mapping are small areas of the poorly drained Drummer soils and the somewhat poorly drained Kendall and Starks soils. Drummer soils are in shallow depressions and drainageways below the Camden soil. Kendall and Starks soils are on slight rises below the Camden soil. Included soils make up 5 to 10 percent of the unit.

Water and air move through the Camden soil at a moderate rate. Surface runoff is medium in cultivated areas. Available water capacity is high. Organic matter content is moderately low. In cultivated areas the surface layer tends to crust and puddle after hard rains. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to openland wildlife habitat. It is also well suited to dwellings with basements and to septic tank absorption fields. It is moderately well suited to dwellings without basements and is poorly suited to local roads and streets.

In the areas used for corn, soybeans, or small grain, erosion is a hazard. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, or a combination of these. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility and prevent surface crusting.

Establishing pasture or hay plants on this soil helps to keep erosion within tolerable limits. Overgrazing, however, reduces forage production and causes surface compaction, which results in excessive runoff and poor tilth and increases the hazard of erosion. Proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to control erosion. Leaving unmowed strips, 30 to 50 feet wide, at the edge of hayland provides excellent nesting cover for openland wildlife.

If this soil is used as a site for dwellings without basements, the shrink-swell potential is a limitation. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

The land capability classification is IIe.

145B2—Saybrook silt loam, 2 to 5 percent slopes, eroded. This gently sloping, moderately well drained soil is on side slopes and ridgetops on till plains and moraines. Individual areas are irregular in shape and range from 3 to 80 acres in size.

Typically, the surface soil is very dark gray, friable silt loam mixed with common dark brown fragments of subsoil material. It is about 9 inches thick. The subsoil is about 27 inches thick. The upper part is dark brown, friable silt loam; the next part is dark yellowish brown and light olive brown, mottled, friable silty clay loam and clay loam; and the lower part is light olive brown, mottled, firm, calcareous loam. The underlying material to a depth of 60 inches or more is light olive brown, mottled, firm, calcareous loam. In places the surface soil is thicker. In some areas the subsoil is thicker or contains less silt and more sand or clay. In other areas the underlying material is stratified loam and sandy loam.

Included with this soil in mapping are small areas of the somewhat poorly drained Lisbon and poorly drained Milford soils. Lisbon soils are on slight rises below the Saybrook soil. Milford soils are in broad, flat areas and in shallow depressions and drainageways below the Saybrook soil. Included soils make up 3 to 8 percent of the unit.

Water and air move through the Saybrook soil at a moderate rate. Surface runoff is medium in cultivated areas. A seasonal high water table is 4 to 6 feet below the surface during the spring. Available water capacity is high. Organic matter content is moderate. The shrink-swell potential is low, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, to openland wildlife habitat, and to dwellings without basements. It is moderately well suited to dwellings with basements and to septic tank absorption fields. It is poorly suited to local roads and streets.

In the areas used for corn, soybeans, or small grain, erosion is a hazard. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, or a combination of these.

If this soil is used as a site for dwellings with basements, the seasonal high water table is a limitation. Installing underground drains around the foundations helps to lower the water table.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table and the moderate permeability are limitations. The septic system functions properly only if the water table is lowered or the distribution lines are installed closer to the surface than is typical. Enlarging the absorption area helps to overcome the moderate absorption of liquid waste.

The land capability classification is IIe.

146A—Elliott silt loam, 0 to 2 percent slopes. This nearly level, somewhat poorly drained soil is on slight rises on till plains and moraines. Individual areas are irregular in shape and range from 3 to more than 300 acres in size.

Typically, the surface soil is very dark gray, friable silt loam about 12 inches thick. The subsoil is about 28 inches thick. It is mottled. The upper part is olive brown, friable silty clay loam and silty clay; the next part is light olive brown, friable silty clay loam; and the lower part is light olive brown, friable, calcareous silty clay loam. The underlying material to a depth of 60 inches or more is light olive brown, mottled, firm, calcareous silty clay loam. In some places the subsoil and underlying material contain less clay and more silt. In other places the subsoil is stratified loam and clay loam. In some areas the soil formed in lacustrine sediments. In a few places the slope is more than 2 percent.

Included with this soil in mapping are small areas of the poorly drained Ashkum soils and the moderately well drained Symerton and Varna soils. Ashkum soils are in broad, flat areas and in shallow depressions and drainageways below the Elliott soil. Symerton and Varna soils are on side slopes and ridgetops above the

Elliott soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Elliott soil at a slow or moderately slow rate. Surface runoff is slow in cultivated areas. A seasonal high water table is 1 to 3 feet below the surface during the spring. Available water capacity is moderate. Organic matter content is high. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to openland wildlife habitat. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

In the areas used for corn, soybeans, or small grain, a drainage system may be needed. Tile drains and surface drains function satisfactorily if suitable outlets are available. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

If this soil is used as a site for dwellings, the seasonal high water table and the shrink-swell potential are limitations. Installing underground drains around the foundations helps to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table and the restricted permeability are limitations. Underground drains help to lower the water table. Enlarging the absorption area helps to overcome the slow or moderately slow absorption of liquid waste.

The land capability classification is IIw.

146B2—Elliott silty clay loam, 2 to 6 percent slopes, eroded. This gently sloping, somewhat poorly drained soil is on side slopes and ridgetops on till plains and moraines. Individual areas are irregular in shape and range from 3 to 100 acres in size.

Typically, the surface soil is very dark grayish brown, friable silty clay loam about 8 inches thick. The subsoil is about 19 inches thick. It is light olive brown, mottled, friable silty clay loam. It is calcareous in the lower part. The underlying material to a depth of 60 inches or more is light olive brown, mottled, firm, calcareous silty clay loam. In places the surface layer is thicker. In a few areas, the subsoil is thinner and calcareous silty clay loam till is closer to the surface. In some places the subsoil and underlying material contain less clay and more sand or silt. In other places the soil formed in lacustrine sediments.

Included with this soil in mapping are small areas of the poorly drained Ashkum soils and the moderately well drained Symerton and Varna soils. Ashkum soils are in broad, flat areas and in shallow depressions and drainageways below the Elliott soil. Symerton and Varna soils are in positions on the landscape similar to those of the Elliott soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Elliott soil at a slow or moderately slow rate. Surface runoff is medium in cultivated areas. A seasonal high water table is 1 to 3 feet below the surface during the spring. Available water capacity is moderate. Organic matter content is high. The surface layer becomes compacted and cloddy if it is tilled when wet. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to openland wildlife habitat. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

In the areas used for corn, soybeans, or small grain, a drainage system may be needed. Tile drains and surface drains function satisfactorily if suitable outlets are available. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

If this soil is used as a site for dwellings, the seasonal high water table and the shrink-swell potential are limitations. Installing underground drains around the foundations helps to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table and the restricted permeability are limitations. Underground drains help to lower the water table. Enlarging the absorption area helps to overcome the slow or moderately slow absorption of liquid waste.

The land capability classification is IIe.

147A—Clarence silty clay loam, 0 to 2 percent slopes. This nearly level, somewhat poorly drained soil is on slight rises on till plains and moraines. Individual areas are irregular in shape and range from 3 to more than 100 acres in size.

Typically, the surface soil is very dark grayish brown, friable silty clay loam about 12 inches thick. The subsoil is silty clay about 26 inches thick. It is mottled. The upper part is dark grayish brown and is firm, the next part is grayish brown and is firm, and the lower part is grayish brown and is very firm and calcareous. The underlying material to a depth of 60 inches or more is mottled light olive brown and gray, very firm, calcareous silty clay. In some small areas the surface soil is thinner. In other areas, the subsoil is thicker and the depth to very firm, calcareous silty clay is greater. In some small areas the subsoil contains more silt or sand

and less clay. In other small areas the slope is more than 2 percent.

Included with this soil in mapping are small areas of the moderately well drained Chatsworth and Mona soils and the poorly drained Rowe soils. Chatsworth and Mona soils are on side slopes and ridgetops above the Clarence soil. Rowe soils are in broad, flat areas and in shallow depressions and drainageways below the Clarence soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Clarence soil at a very slow rate. Surface runoff is slow in cultivated areas. A seasonal high water table is 1 to 3 feet below the surface during the spring. Available water capacity is moderate. Organic matter content also is moderate. The surface layer becomes compacted and cloddy if it is tilled when wet. The shrink-swell potential and the potential for frost action are moderate.

Most areas are cultivated. This soil is moderately well suited to cultivated crops, to pasture and hay, and to openland wildlife habitat. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

In the areas used for corn, soybeans, or small grain, wetness and the low available water capacity are limitations. Surface drains function satisfactorily if suitable outlets are available. Open drainage ditches help to lower the water table. Keeping tillage at a minimum and returning crop residue to the soil conserve moisture and improve tilth and fertility.

If this soil is used as a site for dwellings, the seasonal high water table and the shrink-swell potential are limitations. The water table can be lowered by installing underground drains in coarse grained material around the foundations. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table and the very slow permeability are limitations. The septic system can function satisfactorily only if a sealed sand filter and a disinfection tank are installed.

The land capability classification is IIIw.

147B2—Clarence silty clay, 2 to 6 percent slopes, eroded. This gently sloping, somewhat poorly drained soil is on side slopes and ridgetops on till plains and moraines. Individual areas are irregular in shape and range from 3 to 100 acres in size.

Typically, the surface soil is mixed very dark grayish brown and dark grayish brown, friable silty clay about 7 inches thick. The subsoil is silty clay about 25 inches thick. It is mottled. The upper part is dark grayish brown and is firm, and the lower part is grayish brown and dark grayish brown and is very firm and calcareous. The underlying material to a depth of 60 inches or more is gray, mottled, very firm, calcareous silty clay. In some places the surface soil is thicker. In some areas the surface soil and the subsoil contain more sand or silt and less clay. In other areas the slope is less than 2 percent or more than 6 percent. In a few places, the subsoil is thicker and the depth to calcareous silty clay is greater.

Included with this soil in mapping are small areas of the moderately well drained Chatsworth and Mona soils and the poorly drained Rowe soils. Chatsworth and Mona soils are in positions on the landscape similar to those of the Clarence soil. Rowe soils are in broad, flat areas and in shallow depressions and drainageways below the Clarence soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Clarence soil at a very slow rate. Surface runoff is medium in cultivated areas. The seasonal high water table is 1 to 3 feet below the surface during the spring. Available water capacity is low. Organic matter content is moderate. The surface layer becomes compacted and cloddy if it is tilled when wet. The shrink-swell potential and the potential for frost action are moderate.

Most areas are cultivated. This soil is moderately well suited to cultivated crops, to pasture and hay, and to openland wildlife habitat. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

In the areas used for corn, soybeans, or small grain, wetness and the low available water capacity are limitations and erosion is a hazard. Surface drains function satisfactorily if suitable outlets are available. Open drainage ditches help to lower the water table. A system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, or a combination of these helps to control erosion. Keeping tillage at a minimum and returning crop residue to the soil conserve moisture and improve tilth and fertility.

If this soil is used as a site for dwellings, the seasonal high water table and the shrink-swell potential are limitations. The water table can be lowered by installing underground drains in coarse grained material around the foundations. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table and the very slow permeability are limitations. The septic system can function satisfactorily only if a sealed sand filter and a disinfection tank are installed.

The land capability classification is IIIe.

148A—Proctor silt loam, 0 to 2 percent slopes. This nearly level, moderately well drained soil is on slight rises on outwash plains and stream terraces. Individual areas are irregular in shape and range from 3 to 100 acres in size.

Typically, the surface soil is very dark gray and very dark grayish brown, friable silt loam about 11 inches thick. The subsoil is about 33 inches thick. It is friable. The upper part is dark brown and brown silty clay loam; the next part is yellowish brown, mottled silty clay loam; and the lower part is yellowish brown, mottled sandy clay loam and stratified loam and sandy clay loam. The underlying material to a depth of 60 inches or more is yellowish brown, mottled, friable, calcareous, stratified sandy loam and silt loam. In some areas the underlying material is firm, calcareous loam or silty clay loam. In other areas the subsoil contains more sand. In a few places the subsoil is not mottled.

Included with this soil in mapping are small areas of the somewhat poorly drained Brenton and poorly drained Drummer soils. Brenton soils are in landscape positions similar to or slightly lower than those of the Proctor soil. Drummer soils are in broad, flat areas and in shallow depressions and drainageways below the Proctor soil. Included soils make up 3 to 12 percent of the unit.

Water and air move through the Proctor soil at a moderate rate. Surface runoff is slow in cultivated areas. A seasonal high water table is 2.5 to 6.0 feet below the surface during the spring. Available water capacity is high. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to openland wildlife habitat. It is moderately well suited to dwellings and is poorly suited to septic tank absorption fields and local roads and streets.

In the areas used for corn, soybeans, or small grain, keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

If this soil is used as a site for dwellings, the seasonal high water table is a limitation. Also, the shrink-swell potential is a limitation on sites for dwellings without basements. Installing underground drains around the foundations helps to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table is a limitation. The septic system functions properly only if the water table is lowered or the distribution lines are installed closer to the surface than is typical.

The land capability classification is I.

148B—Proctor silt loam, 2 to 5 percent slopes. This gently sloping, moderately well drained soil is on side slopes and ridgetops on outwash plains and stream terraces. Individual areas are irregular in shape and range from 3 to 100 acres in size.

Typically, the surface soil is very dark grayish brown and dark brown, friable silt loam about 12 inches thick. The subsoil is about 35 inches thick. The upper part is brown, firm silty clay loam; the next part is brown, mottled, firm loam; and the lower part is dark yellowish brown, mottled, friable sandy loam. The underlying material to a depth of 60 inches or more is yellowish brown and brown, friable, stratified sandy loam and loam. In places the surface soil is thinner or lighter in color. In some areas the underlying material is firm, calcareous loam or silty clay loam. In other areas the subsoil contains more sand. In a few places the subsoil is not mottled.

Included with this soil in mapping are small areas of the somewhat poorly drained Brenton and poorly drained Drummer soils. Brenton soils are on slight rises below the Proctor soil. Drummer soils are in broad, flat areas and in shallow depressions and drainageways below the Proctor soil. Included soils make up 3 to 12 percent of the unit.

Water and air move through the Proctor soil at a moderate rate. Surface runoff is medium in cultivated areas. A seasonal high water table is 2.5 to 6.0 feet below the surface during the spring. Available water capacity is high. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to openland wildlife habitat. It is moderately well suited to dwellings and is poorly suited to septic tank absorption fields and local roads and streets.

In the areas used for corn, soybeans, or small grain, erosion is a hazard. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, or a combination of these.

If this soil is used as a site for dwellings, the seasonal high water table is a limitation. Also, the shrink-swell potential is a limitation on sites for dwellings without basements. Installing underground drains around the foundations helps to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table is a limitation. The septic system functions properly only if the water table is lowered or the distribution lines are installed closer to the surface than is typical.

The land capability classification is IIe.

148C2—Proctor silt loam, 5 to 8 percent slopes, eroded. This moderately sloping, well drained soil is on side slopes and ridgetops on outwash plains and stream terraces. Individual areas are irregularly shaped or oblong and range from 3 to 60 acres in size.

Typically, the surface soil is dark brown, friable silt loam about 8 inches thick. The subsoil is about 49 inches thick. The upper part is dark yellowish brown, friable silty clay loam; the next part is dark yellowish brown, friable sandy clay loam; and the lower part is dark yellowish brown, very friable, stratified sandy clay loam, sandy loam, and loamy sand. The underlying material to a depth of 60 inches or more is yellowish brown, very friable, stratified sandy loam, loamy sand, and sand. In a few areas the surface soil is thicker. In places the subsoil contains more sand and less clay. In some areas part of the underlying material is calcareous loam or silty clay loam till.

Included with this soil in mapping are small areas of the somewhat poorly drained Brenton and poorly drained Drummer soils. Brenton soils are on slight rises below the Proctor soil. Drummer soils are in broad, flat areas and in shallow depressions and drainageways below the Proctor soil. Included areas make up 2 to 10 percent of the unit.

Water and air move through the Proctor soil at a moderate rate. Surface runoff is medium in cultivated areas. Available water capacity is high. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to pasture and hay and to openland wildlife habitat. It is moderately well suited to cultivated crops and to dwellings. It is poorly suited to local roads and streets and to septic tank absorption fields.

In the areas used for corn, soybeans, or small grain, further erosion is a hazard. A crop rotation that includes a forage crop, a system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, or a combination of these helps to keep soil loss at an acceptable level and thus maintains productivity.

If this soil is used as a site for dwellings, the seasonal high water table is a limitation. Also, the shrink-swell potential is a limitation on sites for dwellings without basements. Installing underground drains around the foundations helps to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table is a limitation. The septic system functions properly only if the water table is lowered or the distribution lines are installed closer to the surface than is typical.

The land capability classification is IIIe.

149—Brenton silt loam. This nearly level, somewhat poorly drained soil is on slight rises on outwash plains and stream terraces. Individual areas are irregular in shape and range from 3 to more than 300 acres in size.

Typically, the surface soil is very dark gray, friable silt loam about 12 inches thick. The subsoil is about 36 inches thick. It is dark brown and dark yellowish brown and is mottled. The upper part is friable silty clay loam; the next part is friable, stratified clay loam and loam; and the lower part is very friable, stratified loam and sandy loam. The underlying material to a depth of 60 inches or more is dark yellowish brown, stratified loam, sandy loam, and loamy sand. In some areas the lower part of the subsoil contains less sand and more silt or clay. In other areas the upper part of the subsoil contains more sand. In a few places the underlying material is firm, calcareous loam.

Included with this soil in mapping are small areas of the poorly drained Drummer soils and the well drained and moderately well drained Proctor soils. Drummer soils are in broad, flat areas and in shallow depressions and drainageways below the Brenton soil. Proctor soils are on slight rises or on side slopes and ridgetops above the Brenton soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Brenton soil at a moderate rate. Surface runoff is slow in cultivated areas. A seasonal high water table is 1 to 3 feet below the surface during the spring. Available water capacity is high. Organic matter content also is high. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated..This soil is well suited to cultivated crops, to pasture and hay, and to openland wildlife habitat. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

In the areas used for corn, soybeans, or small grain, a drainage system may be needed. Tile drains and surface drains function satisfactorily if suitable outlets are available. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

If this soil is used as a site for dwellings or septic tank absorption fields, the seasonal high water table is a limitation. Also, the shrink-swell potential is a limitation on sites for dwellings. Underground drains help to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

The land capability classification is I.

150B—Onarga sandy loam, 1 to 5 percent slopes. This gently sloping, well drained soil is on side slopes and ridgetops in the uplands. Individual areas are irregular in shape and range from 3 to 80 acres in size.

Typically, the surface soil is very dark grayish brown, friable sandy loam about 13 inches thick. The subsoil is about 19 inches thick. It is sandy loam. The upper part is dark yellowish brown and is friable, and the lower part is brown and is very friable. The underlying material to a depth of 60 inches or more is dark yellowish brown and yellowish brown, loose sand. In some areas the surface layer is thinner or lighter in color. In other areas the lower part of the subsoil has gray mottles. In a few places the subsoil and underlying material contain less sand and more silt or clay. In some places the underlying material is compact, calcareous loam.

Included with this soil in mapping are small areas of the somewhat poorly drained Brenton and La Hogue soils and the poorly drained Drummer and Selma soils. Brenton and La Hogue soils are on slight rises below the Onarga soil. Drummer and Selma soils are in broad, flat areas and in shallow depressions and drainageways below the Onarga soil. Included soils make up 5 to 15 percent of the unit.

Water and air move through the upper part of the Onarga soil at a moderate rate and through the underlying material at a rapid rate. Surface runoff is slow in cultivated areas. Available water capacity is moderate. Organic matter content and the potential for frost action also are moderate.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, to openland wildlife habitat, and to dwellings and septic tank absorption fields. It is moderately well suited to local roads and streets.

In the areas used for corn, soybeans, or small grain, erosion is a hazard. A crop rotation that includes a forage crop, a system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, or a combination of these helps to keep soil loss at an acceptable level and thus maintains productivity.

If this soil is used as a site for septic tank absorption fields, a poor filtering capacity is a limitation. The soil readily absorbs but may not adequately filter the effluent. The poor filtering capacity may result in the contamination of ground water. Wells should be tested on a regular basis for possible contamination.

The land capability classification is IIe.

150C2—Onarga fine sandy loam, 5 to 8 percent slopes, eroded. This moderately sloping, well drained soil is on side slopes and ridgetops in the uplands. Individual areas are irregularly shaped or oblong and range from 3 to 35 acres in size.

Typically, the surface soil is dark brown, friable fine sandy loam about 7 inches thick. The subsoil is about 41 inches thick. It is dark yellowish brown and yellowish brown. The upper part is friable fine sandy loam, and the lower part is friable and very friable, stratified fine sandy loam and loamy fine sand. The underlying material to a depth of 60 inches or more is dark yellowish brown, very friable, stratified fine sandy loam and loamy fine sand. In some areas the underlying material is firm, calcareous loam. In other areas the underlying material is calcareous sand and gravel. In a few places the subsoil contains less sand and more silt or clay. In some places the surface soil is thicker.

Included with this soil in mapping are small areas of the poorly drained Drummer and somewhat poorly drained La Hogue soils. Drummer soils are in broad, flat areas and in shallow depressions and drainageways below the Onarga soil. La Hogue soils are on slight rises below the Onarga soil. Included soils make up 5 to 10 percent of the unit.

Water and air move through the upper part of the Onarga soil at a moderate rate and through the underlying material at a rapid rate. Surface runoff is slow in cultivated areas. Available water capacity is moderate. Organic matter content and the potential for frost action also are moderate.

Most areas are cultivated. This soil is well suited to pasture and hay, to openland wildlife habitat, to septic tank absorption fields, and to dwellings. It is moderately well suited to cultivated crops and to local roads and streets.

In the areas used for corn, soybeans, or small grain, further erosion is a hazard. A crop rotation that includes a forage crop, a system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, or a combination of these helps to keep soil loss at an acceptable level and thus maintains productivity.

If this soil is used as a site for septic tank absorption fields, a poor filtering capacity is a limitation. The soil readily absorbs but may not adequately filter the effluent. The poor filtering capacity may result in the contamination of ground water. Wells should be tested on a regular basis for possible contamination.

The land capability classification is IIIe.

152—Drummer silty clay loam. This nearly level, poorly drained soil is in broad, flat areas and in shallow depressions and drainageways on uplands. It is occasionally ponded for brief periods in the winter and spring. Individual areas are irregular in shape and range from 3 to more than 10,000 acres in size.

Typically, the surface soil is black, friable silty clay loam about 13 inches thick. The subsoil is about 41 inches thick. It is mottled. The upper part is dark gray and gray, friable silty clay loam, and the lower part is gray, friable, calcareous, stratified loam, clay loam, and silt loam. The underlying material to a depth of 60 inches or more is light gray, mottled, friable, stratified loam, silt loam, and clay loam. In a few places the surface soil is thicker and contains less clay. In some areas the underlying material is firm, calcareous loam. In other areas, the surface soil is thinner and is silt loam and the soil has a subsurface layer of grayish brown silt loam. In a few places the upper part of the subsoil is calcareous.

Included with this soil in mapping are small areas of the somewhat poorly drained Brenton and Flanagan soils and the moderately well drained Catlin and Dana soils. Brenton and Flanagan soils are on slight rises above the Drummer soil. Catlin and Dana soils are on side slopes and ridgetops above the Drummer soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Drummer soil at a moderate rate. Surface runoff is slow to ponded in cultivated areas. A seasonal high water table is 0.5 foot above to 2.0 feet below the surface during the spring. Available water capacity is very high. Organic matter content is high. The surface layer becomes compacted and cloddy if it is tilled when wet. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops and to openland wildlife habitat. It is moderately well suited to pasture and hay. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

This soil is sufficiently drained for the commonly grown crops. Measures that maintain or improve the drainage system are needed. Tile drains and surface drains function satisfactorily if suitable outlets are available. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

If this soil is used as a site for dwellings, the ponding and the shrink-swell potential are management concerns. Underground drains help to lower the water table, and surface drains help to control the ponding. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the ponding and the moderate permeability are management concerns. A drainage system is needed. Also, adding as much as 2 feet of loamy fill material increases the depth to the seasonal high water table. Enlarging the absorption area helps to overcome the moderate absorption of liquid waste.

The land capability classification is IIw.

153—Pella silty clay loam. This nearly level, poorly drained soil is on broad flats and in shallow depressions on outwash plains and till plains. It is occasionally ponded for brief periods in the winter and spring. Individual areas are irregular in shape and range from 3 to 100 acres in size.

Typically, the surface soil is black, friable and firm silty clay loam about 12 inches thick. The subsoil is about 24 inches thick. It is mottled. The upper part is grayish brown, friable silty clay loam; the next part is gray, friable, calcareous silty clay loam; and the lower part is light grayish brown, friable, calcareous silt loam. The underlying material to a depth of 60 inches or more is light brownish gray and light olive brown, mottled, friable, calcareous silt loam and loam. In some areas calcareous material is at a shallower or greater depth. In other areas the underlying material is firm, calcareous loam. In a few places the underlying material contains less sand and more silt or clay.

Included with this soil in mapping are small areas of the somewhat poorly drained Brenton and Flanagan soils and the moderately well drained Catlin soils. Brenton and Flanagan soils are on slight rises above the Pella soil. Catlin soils are on side slopes and ridgetops above the Pella soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Pella soil at a moderate rate. Surface runoff is slow to ponded in cultivated areas. A seasonal high water table is 0.5 foot above to 2.0 feet below the surface during the spring. Available water capacity is high. Organic matter content also is high. The surface soil becomes compacted and cloddy if it is tilled when wet. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops and to openland wildlife habitat. It is moderately well suited to pasture and hay. It is poorly suited to dwellings, local roads and streets, and septic tank absorption fields.

This soil is sufficiently drained for the commonly grown crops. Measures that maintain or improve the drainage system are needed. Tile drains and surface drains function satisfactorily if suitable outlets are available. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

If this soil is used as a site for dwellings, the ponding and the shrink-swell potential are management concerns. Underground drains help to lower the water table, and surface drains help to control the ponding. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the ponding and the moderate permeability are management concerns. A drainage system is needed. Also, adding as much as 2 feet of loamy fill material increases the depth to the seasonal high water table. Enlarging the absorption area helps to overcome the moderate absorption of liquid waste.

The land capability classification is IIw.

154—Flanagan silt loam. This nearly level, somewhat poorly drained soil is on slight rises on till plains and moraines. Individual areas are irregular in shape and range from 3 to more than 500 acres in size.

Typically, the surface layer is black, very friable silt loam about 8 inches thick. The subsurface layer is very dark gray, friable silt loam about 8 inches thick. The subsoil is about 40 inches thick. It is mottled. The upper part is dark brown, friable silty clay loam; the next part is dark brown, firm silty clay loam; and the lower part is light olive brown, firm, calcareous clay loam. The underlying material to a depth of 60 inches or more is light olive brown, mottled, very firm, calcareous loam. In some areas the lower part of the subsoil contains less sand and more silt. In a few places the underlying material is stratified sandy loam, loamy sand, and loam. In some areas the upper part of the subsoil contains less clay and more sand or silt. In a few areas the slope is greater than 2 percent.

Included with this soil in mapping are small areas of the moderately well drained Catlin and Dana soils and the poorly drained Drummer soils. Catlin and Dana soils are on side slopes and ridgetops above the Flanagan soil. Drummer soils are in broad, flat areas and in shallow depressions and drainageways below the Flanagan soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Flanagan soil at a moderately slow rate. Surface runoff is slow in cultivated areas. A seasonal high water table is 1.5 to 3.5 feet below the surface during the spring. Available water capacity and organic matter content are high. The shrink-swell potential and the potential for frost action also are high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to openland wildlife habitat. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

In the areas used for corn, soybeans, or small grain, a drainage system may be needed. Tile drains and surface drains function satisfactorily if suitable outlets are available. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

If this soil is used as a site for dwellings, the seasonal high water table and the shrink-swell potential are limitations. Installing underground drains around the foundations helps to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table and the moderately slow permeability are limitations. Underground drains help to lower the water table. Enlarging the absorption area helps to overcome the moderately slow absorption of liquid waste.

The land capability classification is I.

171B—Catlin silt loam, 2 to 5 percent slopes. This gently sloping, moderately well drained soil is on side slopes and ridgetops on till plains and moraines. Individual areas are irregular in shape and range from 3 to 80 acres in size.

Typically, the surface soil is very dark grayish brown, friable silt loam about 15 inches thick. The subsoil is about 44 inches thick. The upper part is dark yellowish brown, friable silty clay loam; the next part is dark yellowish brown, mottled, friable silty clay loam; and the lower part is olive brown, mottled, firm clay loam. The underlying material to a depth of 74 inches or more is olive brown, mottled, firm, calcareous loam. In some areas the surface layer is thinner or lighter in color. In other areas the underlying material is noncalcareous, stratified loam and sandy loam. In a few places, the subsoil is thinner and calcareous loam is closer to the surface.

Included with this soil in mapping are small areas of the poorly drained Drummer and somewhat poorly drained Flanagan soils. Drummer soils are in broad, flat areas and in shallow depressions and drainageways below the Catlin soil. Flanagan soils are on slight rises below the Catlin soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Catlin soil at a moderate rate. Surface runoff is medium in cultivated areas. A seasonal high water table is 3.5 to 6.0 feet below the surface during the spring. Available water capacity is very high. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to openland wildlife habitat. It is moderately well suited to dwellings and is poorly suited to septic tank absorption fields and local roads and streets.

In the areas used for corn, soybeans, or small grain, erosion is a hazard. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, or a combination of these.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. Also, the seasonal high water table is a limitation on sites for dwellings with basements. Installing underground drains around the foundations helps to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table and the moderate permeability are limitations. The septic system functions properly only if the water table is lowered or the distribution lines are installed closer to the surface than is typical. Enlarging the absorption area helps to overcome the moderate absorption of liquid waste.

The land capability classification is IIe.

182—Peotone mucky silty clay loam, marly substratum. This nearly level, very poorly drained soil is in depressions on uplands. It is frequently ponded for brief periods. Individual areas are round or oval and range from 3 to 35 acres in size.

Typically, the surface soil is very dark gray, friable mucky silty clay loam about 21 inches thick. The subsoil is about 35 inches thick. The upper part is black, friable mucky silty clay loam, and the lower part is grayish brown and gray, friable mucky silty clay and mucky silty clay loam. The underlying material to a depth of 64 inches or more is olive gray, calcareous silt loam marl. In places the surface soil is thinner. In some areas the surface soil and the subsoil contain more clay. In other areas the subsoil is thinner. In a few areas, the subsoil contains less organic matter and the underlying material is stratified loam and sandy loam.

Included with this soil in mapping are small areas of the somewhat poorly drained Andres and Elliott soils and the moderately well drained Symerton soils. Andres and Elliott soils are on slight rises above the Peotone soil. Symerton soils are on side slopes and ridgetops above the Peotone soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Peotone soil at a moderately slow rate. Surface runoff is ponded in cultivated areas. A seasonal high water table is 1 foot above to 1 foot below the surface during the spring. Available water capacity is very high. Organic matter content also is very high. The soil may be unstable. It may be compressible when supporting a heavy load and may be subject to subsidence when drained. The surface soil becomes compacted and cloddy if it is tilled when wet. The potential for frost action and the shrink-swell potential are high.

Most areas are cultivated. This soil is moderately well suited to cultivated crops in drained areas and to wetland wildlife habitat in undrained areas. It is moderately well suited to pasture and hay. It is poorly suited to dwellings without basements and to local roads and streets and generally is unsuited to dwellings with basements and to septic tank absorption fields.

In the areas used for corn, soybeans, or small grain, the seasonal high water table and the ponding may delay planting, damage crops, and reduce productivity. Surface drains help to control the ponding. Tile drains help to lower the water table. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

If this soil is used as a site for dwellings without basements, the ponding, the shrink-swell potential, and low strength are management concerns. Underground drains help to lower the water table, and surface drains help to control the ponding. Replacing the subsoil with suitable fill material helps to prevent the damage caused by low strength and by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the ponding and the restricted permeability are management concerns. The septic system can function satisfactorily only if the water table is lowered and a sealed sand filter and a disinfection tank are installed.

The land capability classification is IIIw.

183—Shaffton loam. This nearly level, somewhat poorly drained soil is on flood plains. It is frequently flooded for brief periods from January through April. Individual areas are long and narrow and range from 3 to 80 acres in size.

Typically, the surface soil is black, friable loam about 13 inches thick. The subsoil is about 31 inches thick. It is mottled, friable loam. The upper part is brown, the next part is grayish brown and brown, and the lower part is grayish brown. The underlying material to a depth of 60 inches or more is grayish brown, mottled, friable, stratified loam, sandy loam, and loamy sand. In some areas the surface layer is thinner or lighter in color. In places the subsoil contains less sand and more silt or clay or is gravelly. In a few areas the soil is not frequently flooded.

Included with this soil in mapping are small areas of the well drained Landes and poorly drained Sawmill soils. Landes soils are on flood plains above the Shaffton soil. Sawmill soils are on flood plains below the Shaffton soil. Included soils make up 5 to 15 percent of the unit.

Water and air move through the Shaffton soil at a moderate rate. Surface runoff is slow. The seasonal high water table is 2 to 4 feet below the surface during the spring. Available water capacity is high. Organic matter content also is high. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are used for cultivated crops. This soil is well suited to cultivated crops, to pasture and hay, to woodland wildlife habitat, and to woodland. It generally is unsuited to dwellings and septic tank absorption fields because of the flooding. It is poorly suited to local roads and streets.

In the areas used for corn, soybeans, or small grain, a drainage system may be needed. Tile drains and surface drains function satisfactorily if suitable outlets are available. The flooding normally does not interfere with crop growth during the growing season, but replanting may be necessary in some areas. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

If this soil is used for pasture and hay, measures that control flooding are needed. Overgrazing or grazing when the soil is too wet reduces forage production and causes surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition.

The land capability classification is IIIw.

194C2—Morley silt loam, 5 to 10 percent slopes, eroded. This moderately sloping, moderately well drained soil is on side slopes and ridgetops on till plains and moraines. Individual areas are irregular in shape and range from 3 to 200 acres in size.

Typically, the surface soil is mixed dark grayish brown and yellowish brown, friable silt loam about 6 inches thick. The subsoil is friable and firm silty clay loam about 22 inches thick. The upper part is yellowish brown, the next part is light olive brown, and the lower part is light olive brown and is mottled and calcareous. The underlying material to a depth of 60 inches or more is light olive brown, mottled, firm, calcareous silty clay loam. In places the soil is severely eroded or is uneroded. In some areas the subsoil contains less clay and more silt or sand. In other areas the underlying material is stratified loam and sandy loam.

Included with this soil in mapping are small areas of the poorly drained Ashkum and somewhat poorly drained Blount soils. Ashkum soils are in shallow depressions and drainageways below the Morley soil. Blount soils are on slight rises above or below the Morley soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Morley soil at a slow or moderately slow rate. Surface runoff is medium in cultivated areas. A seasonal high water table is 3 to 6 feet below the surface during the spring. Available water capacity is moderate. Organic matter content is moderately low. In cultivated areas the surface layer tends to crust and puddle after hard rains. The shrink-swell potential and the potential for frost action are moderate.

Most areas are cultivated or are used for pasture and hay. This soil is well suited to pasture and hay, to woodland, and to woodland wildlife habitat. It is moderately well suited to cultivated crops and to dwellings and is poorly suited to septic tank absorption fields and local roads and streets.

In the areas used for corn, soybeans, or small grain, further erosion is a hazard. A crop rotation that includes a forage crop, a system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, or a combination of these helps to keep soil loss at an acceptable level and thus maintains productivity. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility and prevent surface crusting.

Establishing pasture or hay plants on this soil helps to keep erosion within tolerable limits. Overgrazing, however, reduces forage production and causes surface compaction, which results in excessive runoff and poor tilth and increases the hazard of erosion. Proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to control erosion.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. Also, the seasonal high water table is a limitation on sites for dwellings with basements. Installing underground drains around the foundations helps to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table and the restricted permeability are limitations. The septic system functions properly only if the water table is lowered or the distribution lines are installed closer to the surface than is typical. Enlarging the absorption area helps to overcome the slow or moderately slow absorption of liquid waste.

The land capability classification is IIIe.

194D3—Morley silt loam, 10 to 18 percent slopes, severely eroded. This strongly sloping, moderately well drained soil is on side slopes on till plains and moraines. Individual areas are linear and range from 3 to 30 acres in size.

Typically, the surface soil is dark brown, friable silt loam about 3 inches thick. The subsoil is friable and firm silty clay loam about 22 inches thick. The upper part is dark grayish brown, and the lower part is grayish brown and light olive brown and is mottled. The underlying material to a depth of 60 inches or more is light olive brown, mottled, firm, calcareous silty clay loam. In some areas the soil is uneroded. In other areas the subsoil contains less clay and more silt or sand. In a few places the subsoil and underlying material are stratified loam and sandy loam.

Included with this soil in mapping are small areas of the poorly drained Ashkum, somewhat poorly drained Blount, and well drained Landes soils. Ashkum soils are in shallow depressions and drainageways below the Morley soil. Blount soils are in nearly level areas above or below the Morley soil. Landes soils are on flood plains below the Morley soil. Included soils make up 5 to 10 percent of the unit.

Water and air move through the Morley soil at a slow or moderately slow rate. Surface runoff is rapid in pastured and wooded areas. A seasonal high water table is 3 to 6 feet below the surface during the spring. Available water capacity and organic matter content are moderate. The shrink-swell potential and the potential for frost action also are moderate.

Most areas are wooded or are used for pasture and hay. This soil is well suited to woodland and to woodland wildlife habitat. It is moderately well suited to pasture and hay and to dwellings. It is poorly suited to cultivated crops and to septic tank absorption fields and local roads and streets.

Establishing pasture or hay plants on this soil helps to keep erosion within tolerable limits. Overgrazing, however, reduces forage production and causes surface compaction, which results in excessive runoff and poor tilth and increases the hazard of erosion. Proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to control erosion.

If this soil is used as woodland, plant competition is a management concern. It affects seedlings of desirable species. In openings where timber has been harvested, competition from undesirable vegetation can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.

If this soil is used as a site for dwellings, the shrink-swell potential and the slope are limitations. Also, the seasonal high water table is a limitation on sites for dwellings with basements. Installing underground drains around the foundations helps to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling. Cutting and filling help to overcome the slope.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table, the restricted permeability, and the slope are limitations. The septic system functions properly only if the water table is lowered or the distribution lines are installed closer to the surface than is typical. Enlarging the absorption area helps to overcome the slow or moderately slow absorption of liquid waste. Installing the filter lines on the contour helps to evenly distribute the liquid waste.

The land capability classification is IVe.

194F—Morley silt loam, 18 to 35 percent slopes. This steep, well drained soil is on side slopes in the uplands. Individual areas are long and narrow or irregularly shaped and range from 3 to 100 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 5 inches thick. The subsurface layer is yellowish brown, friable silt loam about 4 inches thick. The subsoil is friable and firm silty clay loam about 36 inches thick. The upper part is yellowish brown and light olive brown, and the lower part is light olive brown and is calcareous. The underlying material to a depth of 60 inches or more is light olive brown, calcareous silty clay loam. In some areas, the subsoil is thinner and carbonates are closer to the surface. In other areas the subsoil contains less clay and more sand or silt. A few areas are more sloping or are severely eroded.

Included with this soil in mapping are small areas of the well drained Landes and somewhat poorly drained Blount soils. Landes soils are on flood plains below the Morley soil. Blount soils are on slight rises or on side slopes and ridgetops above the Morley soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Morley soil at a slow or moderately slow rate. Surface runoff is very rapid in wooded areas. Available water capacity is moderate. Organic matter content is moderately low. The shrink-swell potential and the potential for frost action are moderate.

Most areas are wooded. This soil is well suited to woodland wildlife habitat and is moderately well suited to woodland. It is poorly suited to pasture, dwellings, septic tank absorption fields, and local roads and streets and is generally unsuited to cultivated crops and to hay because of the slope.

Establishing pasture or hay plants on this soil helps to keep erosion within tolerable limits. Overgrazing, however, reduces forage production and causes surface compaction, which results in excessive runoff and poor tilth and increases the hazard of erosion. Proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to control erosion.

If this soil is used as woodland, the erosion hazard, the equipment limitation, and seedling mortality are management concerns because of the slope. Plant competition is also a management concern. It affects seedlings of desirable species. Bare logging areas should be seeded to grass or to a grass-legume mixture. The use of machinery should be limited to periods when the soil is firm enough to support the equipment. The seedling mortality rate can be reduced by managing for species that will tolerate droughtiness or by planting those species. In openings where timber has been harvested, competition from undesirable vegetation can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.

If this soil is used as a site for dwellings, the shrink-swell potential and the slope are limitations. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling. Cutting and filling help to overcome the slope.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table, the restricted permeability, and the slope are limitations. The septic system functions properly only if the water table is lowered or the distribution lines are installed closer to the surface than is typical. Enlarging the absorption area helps to overcome the slow or moderately slow absorption of liquid waste. Installing the filter lines on the contour helps to evenly distribute the liquid waste.

The land capability classification is VIe.

194G—Morley silt loam, 35 to 70 percent slopes. This very steep, well drained soil is on side slopes in the uplands. Individual areas are long and narrow and range from 3 to 200 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 4 inches thick. The subsurface layer is dark brown, friable silty clay loam about 4 inches thick. The subsoil is silty clay loam about 21 inches thick. The upper part is dark yellowish brown and friable, and the lower part is light olive brown and is firm and calcareous. The underlying material to a depth of 60 inches or more is light olive brown, firm, calcareous silty clay loam. In some areas, the subsoil is thinner and carbonates are closer to the surface. In other areas the subsoil contains less clay and more sand or silt. A few areas are more sloping or are severely eroded.

Included with this soil in mapping are small areas of the well drained Landes and somewhat poorly drained Blount soils. Landes soils are on flood plains below the Morley soil. Blount soils are on slight rises or on side slopes and ridgetops above the Morley soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Morley soil at a slow or moderately slow rate. Surface runoff is very rapid in wooded areas. Available water capacity is moderate. Organic matter content is moderately low. The shrink-swell potential and the potential for frost action are moderate.

Most areas are wooded. This soil is well suited to woodland wildlife habitat and is moderately well suited to woodland. It generally is unsuited to cultivated crops and to pasture and hay and to dwellings, septic tank absorption fields, and local roads and streets because of the slope.

This soil provides good habitat for woodland wildlife. Measures that exclude livestock from the woodland help to prevent the depletion of the shrubs and sprouts that provide food and cover for woodland wildlife, such as deer, squirrels, and a variety of songbirds. Hedges and rows of shrubs provide cover for doves and many songbirds.

If this soil is used as woodland, the erosion hazard, the equipment limitation, and seedling mortality are management concerns. Plant competition is also a management concern. It affects seedlings of desirable species. Bare logging areas should be seeded to grass or to a grass-legume mixture. The use of machinery should be limited to periods when the soil is firm enough to support the equipment. The seedling mortality rate can be reduced by managing for species that will tolerate droughtiness or by planting those species. In openings where timber has been harvested, competition from undesirable vegetation can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.

The land capability classification is VIIe.

198—Elburn silt loam. This nearly level, somewhat poorly drained soil is on slight rises in the uplands. Individual areas are irregular in shape and range from 3 to 80 acres in size.

Typically, the surface soil is very dark gray, friable silt loam about 16 inches thick. The subsoil is about 44 inches thick. It is mottled. The upper part is dark yellowish brown, friable silty clay loam; the next part is yellowish brown, friable silty clay loam; and the lower part is yellowish brown, friable, stratified silt loam, clay loam, and loam. In some areas the lower part of the subsoil and the underlying material are compact, calcareous loam. In other areas the subsoil contains less silt and more sand.

Included with this soil in mapping are small areas of the well drained Plano soils, the well drained and moderately well drained Proctor soils, and the poorly drained Drummer soils. Plano and Proctor soils are on slight rises, side slopes, and ridgetops above the Elburn soil. Drummer soils are in broad, flat areas and in shallow depressions and drainageways below the Elburn soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Elburn soil at a moderate rate. Surface runoff is slow in cultivated areas. A seasonal high water table is 1 to 3 feet below the surface during the spring. Available water capacity is high. Organic matter content also is high. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to openland wildlife habitat. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

In the areas used for corn, soybeans, or small grain, a drainage system may be needed. Tile drains and surface drains function satisfactorily if suitable outlets are available. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

If this soil is used as a site for dwellings or septic tank absorption fields, the seasonal high water table is a limitation. Also, the shrink-swell potential is a limitation on sites for dwellings. Underground drains help to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

The land capability classification is I.

199B—Plano silt loam, 2 to 5 percent slopes. This gently sloping, well drained soil is on side slopes and ridgetops in the uplands. Individual areas are irregular in shape and range from 3 to 100 acres in size.

Typically, the surface soil is very dark gray, very friable and friable silt loam about 13 inches thick. The subsoil is about 43 inches thick. The upper part is very dark grayish brown, friable silty clay loam; the next part is dark brown and dark yellowish brown, firm silty clay loam; and the lower part is dark yellowish brown, friable silt loam and stratified silt loam and sandy loam. The underlying material to a depth of 64 inches or more is dark yellowish brown, mottled, friable sandy loam. In places the surface soil is thinner or lighter in color. In some areas the underlying material is firm, calcareous loam. In other areas the upper part of the subsoil contains more sand. In some places the slope is less than 2 percent.

Included with this soil in mapping are small areas of the poorly drained Drummer and somewhat poorly drained Elburn soils. Drummer soils are in broad, flat areas and in shallow depressions and drainageways below the Plano soil. Elburn soils are on slight rises below the Plano soil. Included soils make up 3 to 12 percent of the unit.

Water and air move through the Plano soil at a moderate rate. Surface runoff is medium in cultivated areas. Available water capacity is very high. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, to openland wildlife habitat, and to septic tank absorption fields. It is moderately well suited to dwellings and is poorly suited to local roads and streets.

In the areas used for corn, soybeans, or small grain, erosion is a hazard. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, or a combination of these.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

The land capability classification is IIe.

221C3—Parr loam, 5 to 12 percent slopes, severely eroded. This moderately sloping, well drained soil is on side slopes and ridgetops on till plains and moraines. Individual areas are irregular in shape and range from 3 to 20 acres in size.

Typically, the surface soil is very dark grayish brown and yellowish brown, friable loam about 6 inches thick. The subsoil is about 30 inches thick. It is friable clay loam. The upper part is yellowish brown, and the lower part is brown and is mottled. The underlying material to a depth of 60 inches or more is brown, mottled, firm, calcareous loam. In a few places the soil is uneroded. In some areas the subsoil is thinner. In other areas the subsoil and underlying material are stratified loam and sandy loam.

Included with this soil in mapping are small areas of the poorly drained Drummer soils and the somewhat poorly drained Flanagan and Raub soils. Drummer soils are in broad, flat areas and in shallow depressions and drainageways below the Parr soil. Flanagan and Raub soils are on slight rises below the Parr soil. Included soils make up 2 to 12 percent of the unit.

Water and air move through the Parr soil at a moderately slow rate. Surface runoff is medium in cultivated areas. Available water capacity and organic matter content are moderate. The shrink-swell potential and the potential for frost action also are moderate.

Most areas are cultivated. This soil is well suited to pasture and hay, to openland wildlife habitat, and to dwellings with basements. It is moderately well suited to cultivated crops, to dwellings without basements, to septic tank absorption fields, and to local roads and streets.

In the areas used for corn, soybeans, or small grain, further erosion is a hazard. A crop rotation that includes a forage crop, a system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, or a combination of these helps to keep soil loss at an acceptable level and thus maintains productivity.

If this soil is used as a site for dwellings without basements, the shrink-swell potential is a limitation. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the moderately slow permeability is a limitation. Enlarging the absorption area helps to overcome the moderately slow absorption of liquid waste.

The land capability classification is IVe.

223B2—Varna silt loam, 2 to 5 percent slopes, eroded. This gently sloping, moderately well drained soil is on side slopes and ridgetops on till plains and moraines. Individual areas are irregular in shape and range from 3 to 80 acres in size.

Typically, the surface soil is mixed very dark gray and olive brown, friable silt loam about 8 inches thick. The subsoil is about 30 inches thick. It is olive brown silty clay loam. The upper part is friable; the next part is mottled and friable; and the lower part is mottled, friable and firm, and calcareous. The underlying material to a depth of 60 inches or more is olive brown, mottled, firm, calcareous silty clay loam. In places the surface soil is thinner or lighter in color. In some areas the subsoil contains less clay and more silt or sand. In other areas the upper part of the subsoil is mottled.

Included with this soil in mapping are small areas of the poorly drained Ashkum and somewhat poorly drained Elliott soils. Ashkum soils are in broad, flat areas and in shallow depressions and drainageways below the Varna soil. Elliott soils are on slight rises or side slopes below the Varna soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Varna soil at a slow or moderately slow rate. Surface runoff is medium in cultivated areas. A seasonal high water table is 3 to 6 feet below the surface during the spring. Available water capacity is high. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to openland wildlife habitat. It is moderately well suited to dwellings and is poorly suited to septic tank absorption fields and local roads and streets.

In the areas used for corn, soybeans, or small grain, erosion is a hazard. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, or a combination of these.

If this soil is used as a site for dwellings with basements, the seasonal high water table is a limitation. Installing underground drains around the foundations helps to lower the water table. If the soil is used as a site for dwellings without basements, the shrink-swell potential is a limitation. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table and the restricted permeability are limitations. The septic system functions properly only if the water table is lowered or the distribution lines are installed closer to the surface than is typical. Enlarging the absorption area helps to overcome the slow or moderately slow absorption of liquid waste.

The land capability classification is IIe.

223C2—Varna silt loam, 5 to 8 percent slopes, eroded. This moderately sloping, moderately well drained soil is on side slopes and ridgetops on till plains and moraines. Individual areas are irregular in shape and range from 2 to 30 acres in size.

Typically, the surface layer is very dark brown, friable silt loam about 7 inches thick. The subsoil is silty clay loam about 32 inches thick. The upper part is olive brown and friable; the next part is grayish brown, mottled, and friable; and the lower part is grayish brown, mottled, firm, and calcareous. The underlying material to a depth of 60 inches or more is grayish brown, mottled, firm, calcareous silty clay loam. In places the surface soil is thinner and lighter in color. In some areas the subsoil contains less clay and more silt or sand. In a few areas the upper part of the subsoil is mottled.

Included with this soil in mapping are small areas of the poorly drained Ashkum and somewhat poorly drained Elliott soils. Ashkum soils are in broad, flat areas or in shallow depressions and drainageways below the Varna soil. Elliott soils are on slight rises below the Varna soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Varna soil at a slow or moderately slow rate. Surface runoff is medium in cultivated areas. A seasonal high water table is 3 to 6 feet below the surface during the spring. Available water capacity is high. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to pasture and hay and to openland wildlife habitat. It is moderately well suited to cultivated crops and to dwellings and is poorly suited to septic tank absorption fields and local roads and streets.

In the areas used for corn, soybeans, or small grain, further erosion is a hazard. A crop rotation that includes a forage crop, a system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, or a combination of these helps to keep soil loss at an acceptable level and thus maintains productivity.

Establishing pasture or hay plants on this soil helps to keep erosion within tolerable limits. Overgrazing, however, causes surface compaction and poor tilth, results in reduced forage yields and excessive runoff, and increases the hazard of erosion. Proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to control erosion.

If this soil is used as a site for dwellings with basements, the seasonal high water table is a limitation. Installing underground drains around the foundations helps to lower the water table. If the soil is used as a site for dwellings without basements, the shrink-swell potential is a limitation. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table and the restricted permeability are limitations. The septic system functions properly only if the water table is lowered or the distribution lines are installed closer to the surface than is typical. Enlarging the absorption area helps to overcome the slow or moderately slow absorption of liquid waste.

The land capability classification is IIIe.

224G—Strawn silt loam, 35 to 75 percent slopes. This very steep, well drained soil is on side slopes in the uplands. Individual areas are long and narrow and range from 3 to 200 acres in size.

Typically, the surface soil is very dark grayish brown and brown, friable silt loam about 2 inches thick. The subsurface layer is dark grayish brown and brown, friable silt loam about 5 inches thick. The subsoil is about 11 inches thick. The upper part is brown, friable silty clay loam, and the lower part is brown, friable, calcareous loam. The underlying material to a depth of 60 inches or more is light olive brown, firm, calcareous loam. In a few places the slope is greater than 75 percent. In some areas, the soil is severely eroded and calcareous loam is closer to the surface. In places the soil contains less clay and more sand or silt.

Included with this soil in mapping are small areas of the well drained Landes and moderately well drained Xenia soils. Landes soils are on flood plains below the Strawn soil. Xenia soils are on side slopes and ridgetops above the Strawn soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Strawn soil at a moderate rate. Surface runoff is very rapid in wooded areas. Available water capacity is moderate. Organic matter content is moderately low. The potential for frost action is moderate.

Most areas are wooded (fig. 11). This soil is well suited to woodland wildlife habitat and is moderately well suited to woodland. It generally is unsuited to cultivated crops, to pasture and hay, to dwellings, to septic tank absorption fields, and to local roads and streets because of the slope.

If this soil is used as woodland, the erosion hazard, the equipment limitation, and seedling mortality are management concerns because of the slope. Plant competition is also a management concern. It affects seedlings of desirable species. Bare logging areas should be seeded to grass or to a grass-legume mixture. The use of machinery should be limited to periods when the soil is firm enough to support the equipment being used. The seedling mortality rate can be reduced by managing for species that will tolerate droughtiness or by planting those species. In openings where timber has been harvested, competition from undesirable vegetation can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.

The land capability classification is VIIe.

230—Rowe silty clay. This nearly level, poorly drained soil is in broad, flat areas and in shallow depressions and drainageways on till plains and moraines. It is occasionally ponded for brief periods in the winter and spring. Individual areas are irregular in shape and range from 3 to more than 1,000 acres in size.

Typically, the surface layer is black, firm silty clay about 8 inches thick. The subsurface layer is very dark gray, mottled, firm silty clay about 6 inches thick. The subsoil is silty clay about 30 inches thick. It is very firm and is mottled. The upper part is dark grayish brown, and the lower part is gray and olive gray and is calcareous. The underlying material to a depth of 60 inches or more is gray, mottled, very firm, calcareous silty clay. In some areas, the subsoil is thicker and the

Figure 11.—Woodland in an area of Strawn silt loam, 35 to 75 percent slopes.

depth to calcareous silty clay is greater. In a few places, the surface layer and the subsurface layer are silty clay loam and the subsurface layer is dark gray. In other areas the underlying material is stratified loam and sandy loam. In a few places the subsoil contains less clay and more silt or sand.

Included with this soil in mapping are small areas of the somewhat poorly drained Clarence and Mokena soils. These soils are on slight rises above the Rowe soil. They make up 4 to 10 percent of the unit.

Water and air move through the Rowe soil at a very slow rate. Surface runoff is slow to ponded in cultivated areas. A seasonal high water table is 0.5 foot above to 1.0 foot below the surface during the spring. Available water capacity is moderate. Organic matter content is high. The surface soil becomes compacted and cloddy if it is tilled when wet. The shrink-swell potential is high, and the potential for frost action is moderate.

Most areas are cultivated. This soil is moderately well suited to cultivated crops, to pasture and hay, and to openland wildlife habitat. It is poorly suited to dwellings without basements and generally is unsuited to dwellings with basements and to septic tank absorption fields.

In the areas used for corn, soybeans, or small grain, the seasonal high water table and the ponding may delay planting, damage crops, and reduce productivity. Open drainage ditches help to lower the water table. Surface drains help to control the ponding. Keeping tillage at a minimum and returning crop residue to the soil conserve moisture and help to maintain tilth and fertility.

If this soil is used as a site for dwellings without basements, the ponding and the shrink-swell potential are management concerns. They can be overcome by providing a layer of suitable soil material and constructing the foundation above the water table and above the part of the soil that has a high shrink-swell potential. The water table can be lowered by installing underground drains in coarse grained material around the footings.

If this soil is used as a site for septic tank absorption fields, the ponding and the very slow permeability are management concerns. The septic system can function satisfactorily only if the water table is lowered and a sealed sand filter and a disinfection tank are installed.

The land capability classification is IIIw.

232—Ashkum silty clay loam. This nearly level, poorly drained soil is in broad, flat areas and in shallow depressions and drainageways on till plains and moraines. It is occasionally ponded for brief periods in the winter and spring. Individual areas are irregular in shape and range from 3 to more than 1,000 acres in size.

Typically, the surface soil is black, friable silty clay loam about 18 inches thick. The subsoil is silty clay loam about 34 inches thick. The upper part is dark gray and friable, and the lower part is gray and light gray and is mottled and firm. The underlying material to a depth of 60 inches or more is light gray, mottled, firm, calcareous silty clay loam. In a few areas the surface soil is thinner and lighter in color. In some areas the subsoil contains less clay and more sand or silt. In other areas the underlying material is stratified silty clay loam, silt loam, and loam. In a few places the surface soil is thicker.

Included with this soil in mapping are small areas of the somewhat poorly drained Andres and Elliott soils and the moderately well drained Symerton and Varna soils. Andres and Elliott soils are on slight rises above the Ashkum soil. Symerton and Varna soils are on side slopes and ridgetops above the Ashkum soil. Included soils make up 2 to 8 percent of the unit.

Water and air move through the Ashkum soil at a moderately slow rate. Surface runoff is slow to ponded in cultivated areas. A seasonal high water table is 1 foot above to 2 feet below the surface during the spring. Available water capacity is high. Organic matter content also is high. The surface layer becomes compacted and cloddy if it is tilled when wet. The shrink-swell potential and the potential for frost action are high.

Most areas are cultivated. This soil is well suited to cultivated crops and is moderately well suited to pasture and hay and to openland wildlife habitat. It is poorly suited to dwellings, local roads and streets, and septic tank absorption fields.

This soil is sufficiently drained for the commonly grown crops. Measures that maintain or improve the drainage system are needed. Tile drains and surface drains function satisfactorily if suitable outlets are available. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

If this soil is used as a site for dwellings, the ponding and the shrink-swell potential are management concerns. Underground drains help to lower the water table, and surface drains help to control the ponding. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the ponding and the moderately slow permeability are management concerns. A drainage system is needed. Also, adding as much as 2 feet of loamy fill material increases the depth to the seasonal high water table. Enlarging the absorption area helps to overcome the moderately slow absorption of liquid waste.

The land capability classification is IIw.

233B—Birkbeck silt loam, 1 to 5 percent slopes. This gently sloping, moderately well drained soil is on side slopes and ridgetops on till plains. Individual areas are irregular in shape and range from 3 to 60 acres in size.

Typically, the surface soil is dark grayish brown, friable silt loam about 10 inches thick. The subsoil is about 45 inches thick. The upper part is dark yellowish brown and yellowish brown, friable silt loam and silty clay loam; the next part is yellowish brown, mottled, friable silty clay loam; and the lower part is olive brown, mottled, friable, calcareous loam. The underlying material to a depth of 60 inches or more is olive brown, mottled, firm, calcareous loam. In some areas the surface soil is darker. In a few places the subsoil contains more sand.

Included with this soil in mapping are small areas of the poorly drained Drummer and somewhat poorly drained Sabina soils. Drummer soils are in shallow depressions and drainageways below the Birkbeck soil. Sabina soils are on slight rises below the Birkbeck soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Birkbeck soil at a moderate rate. Surface runoff is medium in cultivated areas. A seasonal high water table is 3 to 6 feet below the surface during the spring. Available water capacity is high. Organic matter content is moderately low. In cultivated areas the surface layer tends to crust and puddle after hard rains. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to openland wildlife habitat. It is moderately well suited to dwellings and is poorly suited to septic tank absorption fields and local roads and streets.

In the areas used for corn, soybeans, or small grain, erosion is a hazard. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, or a combination of these. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility and prevent surface crusting.

Establishing pasture or hay plants on this soil helps to keep erosion within tolerable limits. Overgrazing, however, reduces forage yields and causes surface compaction, which results in excessive runoff and poor tilth and increases the hazard of erosion. Proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to control erosion. Leaving unmowed strips, 30 to 50 feet wide, at the edge of hayland provides excellent nesting cover for openland wildlife.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. Also, the seasonal high water table is a limitation on sites for dwellings with basements. Installing underground drains around the foundations helps to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table and the moderately slow permeability are limitations. The septic system functions properly only if the water table is lowered or the distribution lines are installed closer to the surface than is typical. Enlarging the absorption area helps to overcome the moderately slow absorption of liquid waste.

The land capability classification is IIe.

235—Bryce silty clay. This nearly level, poorly drained soil is in broad, flat areas and in shallow depressions and drainageways on till plains and moraines. It is occasionally ponded for brief periods in the winter and spring. Individual areas are irregular in shape and range from 3 to more than 300 acres in size.

Typically, the surface soil is black, friable silty clay about 16 inches thick. The subsoil is silty clay about 39 inches thick. It is mottled. The upper part is dark grayish brown and olive gray and is firm, the next part is gray and is very firm, and the lower part is gray and is very firm and calcareous. The underlying material to a depth of 60 inches or more is gray, mottled, very firm, calcareous silty clay. In places, the subsoil is thicker and the depth to calcareous silty clay is greater. In some areas the underlying material is stratified loam and sandy loam. In a few places the subsoil contains less clay and more silt or sand.

Included with this soil in mapping are small areas of the somewhat poorly drained Mokena and Swygert soils and the very poorly drained Rantoul soils. Mokena and Swygert soils are on slight rises above the Bryce soil. Rantoul soils are in depressions below the Bryce soil. Included soils make up 2 to 8 percent of the unit.

Water and air move through the Bryce soil at a slow rate. Surface runoff is slow to ponded in cultivated areas. A seasonal high water table is 1 foot above to 1 foot below the surface during the spring. Available water capacity is low. Organic matter content is high. The surface soil becomes compacted and cloddy if it is tilled when wet. The shrink-swell potential and the potential for frost action are high.

Most areas are cultivated. This soil is well suited to cultivated crops and is moderately well suited to pasture and hay and to openland wildlife habitat. It is poorly suited to local roads and streets and to dwellings and generally is unsuited to septic tank absorption fields.

This soil is sufficiently drained for the commonly grown crops. Measures that maintain or improve the drainage system are needed. Surface drains function satisfactorily if suitable outlets are available. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

If this soil is used as a site for dwellings, the ponding and the shrink-swell potential are management concerns. Underground drains help to lower the water table, and surface drains help to control the ponding. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the ponding and the very slow permeability are management concerns. The septic system can function satisfactorily only if the water table is lowered and a sealed sand filter and a disinfection tank are installed.

The land capability classification is IIw.

236—Sabina silt loam. This nearly level, somewhat poorly drained soil is on slight rises on till plains. Individual areas are irregular in shape and range from 3 to more than 200 acres in size.

Typically, the surface soil is dark grayish brown and grayish brown, friable silt loam about 13 inches thick. The subsoil is about 45 inches thick. It is mottled. The upper part is brown, firm silty clay loam; the next part is yellowish brown, friable silty clay loam; and the lower part is light olive brown, firm, calcareous loam. The underlying material to a depth of 60 inches or more is light olive brown, mottled, firm, calcareous loam. In places the surface soil is darker. In some areas the underlying material is stratified loam and sandy loam. In other areas the subsoil contains less clay and more silt or sand.

Included with this soil in mapping are small areas of the moderately well drained Birkbeck and Xenia soils and the poorly drained Drummer soils. Birkbeck and Xenia soils are on side slopes and ridgetops above the Sabina soil. Drummer soils are in shallow depressions and drainageways below the Sabina soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Sabina soil at a moderately slow rate. Surface runoff is slow in cultivated areas. A seasonal high water table is 1.5 to 3.5 feet below the surface during the spring. Available water capacity is high. Organic matter content is moderately low. In cultivated areas the surface layer tends to crust and puddle after hard rains. The shrink-swell potential and the potential for frost action are high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to habitat for openland wildlife. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

This soil is sufficiently drained for the commonly grown crops. Measures that maintain or improve the drainage system are needed. Tile drains and surface drains function satisfactorily if suitable outlets are available. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility and prevent surface crusting.

Pasture and hay plants grow well on this soil. Overgrazing or grazing when the soil is too wet, however, reduces forage production and causes surface compaction, excessive runoff, and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition. Leaving unmowed strips, 30 to 50 feet wide, at the edge of hayland provides excellent nesting cover for openland wildlife.

If this soil is used as a site for dwellings, the seasonal high water table and the shrink-swell potential are limitations. Installing underground drains around the foundations helps to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table and the moderately slow permeability are limitations. Underground drains help to lower the water table. Enlarging the absorption area helps to overcome the moderately slow absorption of liquid waste.

The land capability classification is IIw.

238—Rantoul silty clay. This nearly level, very poorly drained soil is in depressions on uplands. It is occasionally ponded for brief periods. Individual areas are round or oval and range from 3 to 50 acres in size.

Typically, the surface soil is black, firm silty clay about 16 inches thick. The subsoil is silty clay about 44 inches thick. The upper part is black and dark gray and is mottled and firm, the next part is gray and is mottled and very firm, and the lower part is gray and is very firm. In some areas the underlying material is stratified loam and sandy loam. In a few areas the upper part of the subsoil is lighter in color. In some places, the subsoil contains more organic matter and the underlying material is marl.

Included with this soil in mapping are small areas of the somewhat poorly drained Clarence and Swygert soils. These soils are on slight rises above the Rantoul soil. They make up 2 to 5 percent of the unit.

Water and air move through the Rantoul soil at a very slow rate. Surface runoff is ponded in cultivated areas. The seasonal high water table is 1 foot above to 1 foot below the surface during the spring. Available water capacity is moderate. Organic matter content is high. The surface soil becomes compacted and cloddy if it is tilled when wet. The shrink-swell potential is high, and the potential for frost action is moderate.

Most areas are cultivated. This soil is moderately well suited to cultivated crops and to pasture and hay. It is poorly suited to dwellings without basements and generally is unsuited to dwellings with basements and to septic tank absorption fields.

In the areas used for corn, soybeans, or small grain, the seasonal high water table and the ponding may delay planting, damage crops, and reduce productivity. Open drainage ditches help to lower the water table. Surface drains help to control the ponding. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

If this soil is used as a site for dwellings without basements, the ponding and the shrink-swell potential are management concerns. They can be overcome by providing a layer of suitable soil material and by constructing the foundation above the water table and above the part of the soil that has a high shrink-swell potential. The water table can be lowered by installing underground drains in coarse grained material around the footings.

If this soil is used as a site for septic tank absorption fields, the ponding and the very slow permeability are management concerns. The septic system can function satisfactorily only if the water table is lowered and a sealed sand filter and a disinfection tank are installed.

The land capability classification is IIIw.

241C—Chatsworth silty clay, 5 to 10 percent slopes. This moderately sloping, moderately well drained soil is on severely eroded side slopes on till plains and moraines. Individual areas are irregular in shape and range from 3 to 15 acres in size.

Typically, the surface soil is dark grayish brown, firm silty clay about 5 inches thick. The subsoil is about 11 inches thick. It is olive gray, mottled, calcareous silty clay. The upper part is firm, and the lower part is very firm. The underlying material to a depth of 60 inches or more is gray, mottled, very firm, calcareous silty clay. In some places, the surface soil is thicker and the depth to carbonates is greater. In other places the surface soil is darker. In a few areas the slope is less than 5 percent or more than 10 percent.

Included with this soil in mapping are small areas of the somewhat poorly drained Clarence and Swygert soils. These soils are on slight rises below the Chatsworth soil. They make up 2 to 5 percent of the unit.

Water and air move through the Chatsworth soil at a very slow rate. Surface runoff is rapid in cultivated areas. Available water capacity is very low. Organic matter content is low. The surface layer becomes compacted and cloddy if it is plowed when wet. In cultivated areas the surface layer tends to crust and puddle after hard rains. The shrink-swell potential and the potential for frost action are moderate.

Most areas are cultivated or are used for pasture and hay. This soil is moderately well suited to septic tank absorption fields and to pasture and hay. It generally is unsuited to cultivated crops because of the effects of past erosion.

Establishing pasture or hay plants on this soil helps to keep erosion within tolerable limits. Overgrazing, however, causes surface compaction, which results in poor tilth, reduced forage yields, and excessive runoff and increases the hazard of erosion. Proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to control erosion.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the very slow permeability is a limitation. The septic system can function satisfactorily only if a sealed sand filter and a disinfection tank are installed.

The land capability classification is VIe.

242—Kendall silt loam. This nearly level, somewhat poorly drained soil is on slight rises on outwash plains and stream terraces. Individual areas are irregular in shape and range from 3 to 150 acres in size.

Typically, the surface layer is dark grayish brown, friable silt loam about 7 inches thick. The subsurface layer is grayish brown, mottled, friable silt loam about 8 inches thick. The subsoil is about 34 inches thick. It is mottled. The upper part is brown, firm silty clay loam; the next part is grayish brown, friable silty clay loam; and the lower part is brown, friable, stratified loam, sandy loam, and clay loam. The underlying material to a depth of 60 inches or more is brown, mottled, friable, stratified loam, sandy loam, and sandy clay loam. In places the surface layer is thicker and darker. In a few areas the underlying material is firm, calcareous loam. In other areas the subsoil contains less silt and more sand.

Included with this soil in mapping are small areas of the well drained Camden and poorly drained Drummer soils. Camden soils are on side slopes and ridgetops above the Kendall soil. Drummer soils are in shallow depressions and drainageways below the Kendall soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Kendall soil at a moderate rate. Surface runoff is slow in cultivated areas. A seasonal high water table is 1 to 3 feet below the surface during the spring. Available water capacity is high. Organic matter content is moderately low. In cultivated areas the surface layer tends to crust and puddle after hard rains. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to habitat for openland wildlife. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

This soil is sufficiently drained for the commonly grown crops. Measures that maintain or improve the drainage system are needed. Tile drains and surface drains function satisfactorily if suitable outlets are available. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility and prevent surface crusting.

Pasture and hay plants grow well on this soil. Overgrazing or grazing when the soil is too wet, however, reduces forage production and causes surface compaction, excessive runoff, and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition. Leaving unmowed strips, 30 to 50 feet wide, at the edge of hayland provides excellent nesting cover for openland wildlife.

If this soil is used as a site for dwellings, the seasonal high water table and the shrink-swell potential are limitations. Installing underground drains around the foundations helps to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table and the moderate permeability are limitations. Underground drains help to lower the water table. Enlarging the absorption area helps to overcome the moderate absorption of liquid waste.

The land capability classification is IIw.

291B—Xenia silt loam, 1 to 5 percent slopes. This gently sloping, moderately well drained soil is on side slopes and ridgetops on till plains and moraines. Individual areas are irregular in shape and range from 3 to 100 acres in size.

Typically, the surface layer is very dark grayish brown and brown, friable silt loam about 11 inches thick. The subsurface layer is brown, friable silt loam about 8 inches thick. The subsoil is about 49 inches thick. The upper part is yellowish brown, friable silt loam; the next part is yellowish brown, mottled, friable silty clay loam; and the lower part is dark yellowish brown, mottled, firm clay loam. In some areas the upper part of the subsoil contains more sand. In other areas the lower part of the subsoil is not mottled or is stratified loam and sandy loam.

Included with this soil in mapping are small areas of the poorly drained Drummer and somewhat poorly drained Sabina soils. Drummer soils are in shallow depressions and drainageways below the Xenia soil. Sabina soils are on slight rises below the Xenia soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Xenia soil at a moderately slow rate. Surface runoff is medium in cultivated areas. A seasonal high water table is 2.0 to 3.5 feet below the surface during the spring. Available water capacity is high. Organic matter content is moderately low. In cultivated areas the surface layer tends to crust and puddle after hard rains. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to openland wildlife habitat. It is moderately well suited to dwellings without basements and is poorly suited to dwellings with basements, to septic tank absorption fields, and to local roads and streets.

In the areas used for corn, soybeans, or small grain, erosion is a hazard. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, or a combination of these. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility and prevent surface crusting.

Establishing pasture or hay plants on this soil helps to keep erosion within tolerable limits. Overgrazing, however, reduces forage yields and causes surface compaction, which results in excessive runoff and poor tilth and increases the hazard of erosion. Proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to control erosion. Leaving unmowed strips, 30 to 50 feet wide, at the edge of hayland provides excellent nesting cover for openland wildlife.

If this soil is used as a site for dwellings, the seasonal high water table and the shrink-swell potential are limitations. Installing underground drains around the foundations helps to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table and the moderately slow permeability are limitations. The septic system functions properly only if the water table is lowered or the distribution lines are installed closer to the surface than is typical. Enlarging the absorption area helps to overcome the moderately slow absorption of liquid waste.

The land capability classification is IIe.

293—Andres loam. This nearly level, somewhat poorly drained soil is on slight rises in the uplands. Individual areas are irregular in shape and range from 3 to 80 acres in size.

Typically, the surface soil is very dark gray, friable loam about 12 inches thick. The subsoil is about 38 inches thick. The upper part is dark brown, friable clay loam; the next part is dark yellowish brown and yellowish brown, mottled, friable clay loam; and the lower part is olive brown, mottled, firm, calcareous silty clay loam. The underlying material to a depth of 60 inches or more is olive brown, mottled, very firm, calcareous silty clay loam. In places the subsoil contains less sand and more silt or clay. In some areas the underlying material is stratified loam and sandy loam. In a few places the upper part of the subsoil is not mottled. In the area east of Hoopeston, the underlying material is firm, calcareous loam.

Included with this soil in mapping are small areas of the poorly drained Ashkum, well drained Jasper, and moderately well drained Symerton soils. Ashkum soils are in broad, flat areas and in shallow depressions and drainageways below the Andres soil. Jasper and Symerton soils are on side slopes and ridgetops above the Andres soil. Included soils make up 5 to 15 percent of the unit.

Water and air move through the Andres soil at a moderately slow rate. Surface runoff is slow in cultivated areas. The seasonal high water table is 1 to 3 feet below the surface in the spring. Available water capacity is high. Organic matter content also is high. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to openland wildlife habitat. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

In the areas used for corn, soybeans, or small grain, a drainage system may be needed. Tile drains and surface drains function satisfactorily if suitable outlets are available. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

If this soil is used as a site for dwellings, the seasonal high water table and the shrink-swell potential are limitations. Installing underground drains around the foundations helps to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table and the moderately slow permeability are limitations. Underground drains help to lower the water table. Enlarging the absorption area helps to overcome the moderately slow absorption of liquid waste.

The land capability classification is I.

294B—Symerton loam, 2 to 5 percent slopes. This gently sloping, moderately well drained soil is on side slopes and ridgetops in the uplands. Individual areas are irregular in shape and range from 3 to 40 acres in size.

Typically, the surface soil is very dark gray, friable loam about 13 inches thick. The subsoil is about 26 inches thick. The upper part is dark yellowish brown, friable loam and clay loam; the next part is dark yellowish brown, friable clay loam that has strata of sandy clay loam; and the lower part is light olive brown, mottled, firm, calcareous silty clay loam. The underlying material to a depth of 60 inches or more is light olive brown, mottled, firm, calcareous silty clay loam. In some places the surface layer is thinner or lighter in color. In other places the surface soil and the subsoil contain less sand and more silt or clay. In some areas the slope is less than 2 percent or more than 5 percent. In a few areas the underlying material is stratified loam and sandy loam. In the area east of Hoopeston, the underlying material is firm, calcareous loam.

Included with this soil in mapping are small areas of the somewhat poorly drained Andres and Elliott soils and the poorly drained Ashkum soils. Andres and Elliott soils are on slight rises below the Symerton soil. Ashkum soils are in broad, flat areas and in shallow depressions below the Symerton soil. Included soils make up 5 to 10 percent of the unit.

Water and air move through the Symerton soil at a moderately slow rate. Surface runoff is medium in cultivated areas. A seasonal high water table is 3.5 to 6.0 feet below the surface during the spring. Available water capacity and organic matter content are moderate. The shrink-swell potential and the potential for frost action also are moderate.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to openland wildlife habitat. It is moderately well suited to dwellings and is poorly suited to septic tank absorption fields and local roads and streets.

In the areas used for corn, soybeans, or small grain, erosion is a hazard. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, or a combination of these.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. Also, the seasonal high water table is a limitation on sites for dwellings with basements. Installing underground drains around the foundations helps to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table and the moderately slow permeability are limitations. The septic system functions properly only if the water table is lowered or the distribution lines are installed closer to the surface than is typical. Enlarging the absorption field helps to overcome the moderately slow absorption of liquid waste.

The land capability classification is IIe.

295—Mokena loam. This nearly level, somewhat poorly drained soil is on slight rises in the uplands. Individual areas are irregular in shape and range from 3 to 40 acres in size.

Typically, the surface soil is very dark gray and very dark grayish brown, friable loam about 13 inches thick. The subsoil is about 35 inches thick. It is mottled. The upper part is dark grayish brown and brown, friable loam and clay loam; the next part is brown, friable, stratified sandy clay loam, sandy loam, and clay loam; and the lower part is grayish brown, very firm, calcareous silty clay. The underlying material to a depth of 60 inches or more is grayish brown, mottled, very firm, calcareous silty clay. In places the subsoil contains less sand and more silt or clay. In some areas the upper part of the subsoil is not mottled. In a few areas the underlying material is stratified loam and sandy loam.

Included with this soil in mapping are small areas of the poorly drained Bryce and Rowe soils and the moderately well drained Chatsworth and Mona soils. Bryce and Rowe soils are in broad, flat areas and in shallow depressions and drainageways below the Mokena soil. Chatsworth and Mona soils are on side slopes and ridgetops above the Mokena soil. Included soils make up 5 to 15 percent of the unit.

Water and air move through the Mokena soil at a slow or moderately slow rate. Surface runoff is slow in cultivated areas. A seasonal high water table is 1 to 3 feet below the surface during the spring. Available water capacity is high. Organic matter content also is high. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, to hay and pasture, and to openland wildlife habitat. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

In the areas used for corn, soybeans, or small grain, a drainage system may be needed. Tile drains and surface drains function satisfactorily if suitable outlets are available. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

If this soil is used as a site for dwellings, the seasonal high water table and the shrink-swell potential are limitations. Installing underground drains around the foundations helps to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table and the restricted permeability are limitations. Underground drains help to lower the water table. Enlarging the absorption area helps to overcome the slow or moderately slow absorption of liquid waste.

The land capability classification is IIw.

302—Ambraw loam. This nearly level, poorly drained soil is on flood plains. It is frequently flooded for brief periods from March through June. Individual areas are long and narrow or irregularly shaped and range from 3 to more than 100 acres in size.

Typically, the surface layer is black, friable loam about 7 inches thick. The subsurface layer is black, mottled, friable loam about 9 inches thick. The subsoil is about 39 inches thick. It is mottled. The upper part is dark grayish brown and grayish brown, friable clay loam, and the lower part is gray, friable loam and stratified loam, clay loam, and sandy loam. The underlying material to a depth of 60 inches or more is gray, mottled, friable, stratified loam, clay loam, and sandy loam. In places the upper part of the subsoil is black or olive gray. In some areas the subsoil contains less sand and more silt or clay. A few areas are only rarely flooded.

Included with this soil in mapping are small areas of the well drained Landes soils. These soils are on flood plains above the Ambraw soil. They make up 2 to 10 percent of the unit.

Water and air move through the Ambraw soil at a moderate or moderately slow rate. Surface runoff is very slow in cultivated areas. A seasonal high water table is at the surface to 2 feet below the surface during the spring. Available water capacity is high. Organic matter content also is high. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops. It is moderately well suited to pasture and hay and is poorly suited to local roads and streets. It generally is unsuited to dwellings and septic tank absorption fields because of the flooding.

This soil is sufficiently drained for the commonly grown crops. Measures that maintain or improve the drainage system are needed. Tile drains and surface drains function satisfactorily if suitable outlets are available. The spring flooding frequently delays planting and damages crops.

If this soil is used for pasture and hay, measures that control flooding are needed. Overgrazing or grazing when the soil is too wet reduces forage production and causes surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition.

The land capability classification is IVw.

330—Peotone silty clay loam. This nearly level, very poorly drained soil is in depressions on uplands. It is occasionally ponded for brief periods. Individual areas are round or oval and range from 3 to 80 acres in size.

Typically, the surface soil is black, friable and firm silty clay loam about 15 inches thick. The subsoil is firm silty clay loam about 41 inches thick. The upper part is black, and the lower part is very dark grayish brown and grayish brown and is mottled. The underlying material to a depth of 60 inches or more is grayish brown, mottled, firm, calcareous silty clay loam. In places the surface soil is thinner. In some areas, the subsoil contains more organic matter and the underlying material is marl.

Included with this soil in mapping are small areas of the somewhat poorly drained Brenton, Elliott, and Flanagan soils. These soils are on slight rises above the Peotone soil. They make up 2 to 10 percent of the unit.

Water and air move through the Peotone soil at a moderately slow rate. Surface runoff is ponded in cultivated areas. A seasonal high water table is 0.5 foot above to 1.0 foot below the surface during the spring. Available water capacity is high. Organic matter content also is high. The surface layer becomes compacted and cloddy if it is tilled when wet. The potential for frost action and the shrink-swell potential are high.

Most areas are cultivated. This soil is well suited to cultivated crops in drained areas and to wetland wildlife habitat in undrained areas. It is moderately well suited to pasture and hay. It is poorly suited to dwellings and local roads and streets and generally is unsuited to septic tank absorption fields.

This soil is sufficiently drained for the commonly grown crops. Measures that maintain or improve the drainage system are needed. Tile drains and surface drains function satisfactorily if suitable outlets are available. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

If this soil is used as a site for dwellings, the ponding and the shrink-swell potential are management concerns. Underground drains help to lower the water table, and surface drains help to control the ponding. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the ponding and the moderately slow permeability are management concerns. The septic system can function satisfactorily only if the water table is lowered and a sealed sand filter and a disinfection tank are installed.

The land capability classification is IIw.

362—Whitaker Variant loam. This nearly level, somewhat poorly drained soil is on slight rises on outwash plains. Individual areas are irregular in shape and range from 5 to 40 acres in size.

Typically, the surface layer is dark grayish brown and grayish brown, friable loam about 13 inches thick. The subsoil is about 48 inches thick. It is mottled. The upper part is dark brown, friable clay loam, and the lower part is olive brown and grayish brown, firm and very firm silty clay loam. In places the surface layer is thicker and darker. In a few areas the underlying material is stratified loam and silt loam. In other areas the subsoil contains less sand and more silt.

Included with this soil in mapping are small areas of the poorly drained Drummer and well drained Martinsville soils. Drummer soils are in shallow depressions and drainageways below the Whitaker soil. Martinsville soils are on side slopes and ridgetops above the Whitaker soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Whitaker soil at a moderate rate. Surface runoff is slow in cultivated areas. A seasonal high water table is 1 to 3 feet below the surface during the spring. Available water capacity is high. Organic matter content is moderately low. In cultivated areas the surface layer tends to crust and puddle after hard rains. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to openland wildlife habitat. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

This soil is sufficiently drained for the commonly grown crops. Measures that maintain or improve the drainage system are needed. Tile drains and surface drains function satisfactorily if suitable outlets are available. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility and prevent surface crusting.

Pasture and hay plants grow well on this soil. Overgrazing or grazing when the soil is too wet, however, reduces forage production and causes surface compaction, excessive runoff, and poor tilth. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition. Leaving unmowed strips, 30 to 50 feet wide, at the edge of hayland provides excellent nesting cover for openland wildlife.

If this soil is used as a site for dwellings or septic tank absorption fields, the seasonal high water table is a limitation. Also, the shrink-swell potential is a limitation on sites for dwellings. Underground drains help to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

The land capability classification is IIw.

387B—Ockley loam, 1 to 4 percent slopes. This gently sloping, well drained soil is on slight rises and side slopes on outwash plains and stream terraces. Individual areas are irregular in shape and range from 5 to 50 acres in size.

Typically, the surface soil is dark grayish brown, friable loam about 9 inches thick. The subsoil is about 49 inches thick. The upper part is dark brown, friable loam; the next part is dark yellowish brown and yellowish brown, friable clay loam; and the lower part is dark yellowish brown, friable gravelly clay loam. The underlying material to a depth of 70 inches or more is light yellowish brown, loose, calcareous, stratified sand and very gravelly sand. In places the surface layer is darker. In some areas the underlying material is firm, calcareous loam. In other areas the middle part of the subsoil contains more sand or less sand and more silt.

Included with this soil in mapping are small areas of the poorly drained Selma and somewhat poorly drained Whitaker soils. Selma soils are in shallow depressions and drainageways below the Ockley soil. Whitaker soils are landscape positions similar to or slightly lower than those of the Ockley soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the upper part of the Ockley soil at a moderate rate and through the underlying material at a very rapid rate. Surface runoff is slow in cultivated areas. Available water capacity is high. Organic matter content is moderately low. In cultivated areas the surface layer tends to crust and puddle after hard rains. The shrink-swell potential and the potential for frost action are moderate.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, to habitat for openland wildlife, and to septic tank absorption fields. It is moderately well suited to dwellings and local roads and streets. It is a probable source of sand and gravel.

In the areas used for corn, soybeans, or small grain, erosion is a hazard. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, or a combination of these. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility and prevent surface crusting.

Establishing pasture or hay plants on this soil helps to keep erosion within tolerable limits. Overgrazing, however, reduces forage yields and causes surface compaction, which results in excessive runoff and poor tilth and increases the hazard of erosion. Proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to control erosion. Leaving unmowed strips, 30 to 50 feet wide, at the edge of hayland provides excellent nesting cover for openland wildlife.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

The land capability classification is IIe.

398—Wea silt loam. This nearly level, well drained soil is on slight rises on outwash plains and stream terraces. Individual areas are irregular in shape and range from 5 to 200 acres in size.

Typically, the surface soil is very dark grayish brown, friable silt loam about 11 inches thick. The subsoil is about 43 inches thick. The upper part is dark brown, friable silty clay loam, and the lower part is dark yellowish brown, friable clay loam. The underlying material to a depth of 64 inches or more is light yellowish brown, loose, calcareous, stratified sand and very gravelly sand. In places the surface layer is thinner or lighter in color. In some areas the underlying material is dark yellowish brown, stratified loam, sandy loam, and sand. In other areas the subsoil is thinner.

Included with this soil in mapping are small areas of the somewhat poorly drained La Hogue and poorly drained Selma soils. La Hogue soils are in landscape positions similar to or slightly lower than those of the Wea soil. Selma soils are in shallow depressions and drainageways below the Wea soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the upper part of the Wea soil at a moderate rate and through the underlying material at a very rapid rate. Surface runoff is slow in cultivated areas. Available water capacity is high. Organic matter content is moderate. The shrink-swell potential and the potential for frost action are moderate.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, to openland wildlife habitat, and to septic tank absorption fields. It is moderately well suited to dwellings and local roads and streets. It is a probable source of sand and gravel.

In the areas used for corn, soybeans, or small grain, keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

The land capability classification is IIs.

430—Raddle silt loam. This nearly level, well drained soil is on foot slopes and stream terraces. It is subject to rare flooding. Individual areas are irregular in shape and range from 3 to more than 100 acres in size.

Typically, the surface soil is very dark grayish brown, friable silt loam about 14 inches thick. The subsoil is friable silt loam about 63 inches thick. The upper part is dark brown and dark yellowish brown, and the lower part is dark yellowish brown and is mottled. In some areas the surface soil is thinner or lighter in color. In other areas the subsoil contains less silt and more sand. A few areas are occasionally flooded.

Included with this soil in mapping are small areas of the somewhat poorly drained Shaffton and poorly drained Sawmill soils. These soils are on flood plains below the Raddle soil. They make up 10 to 15 percent of the unit.

Water and air move through the Raddle soil at a moderate rate. Surface runoff is slow in cultivated areas. Available water capacity is very high. Organic matter content is moderate. The potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops and to pasture and hay. It is poorly suited to local roads and streets. It generally is unsuited to dwellings and septic tank absorption fields because of the flooding.

In the areas used for corn, soybeans, or small grain, flooding normally does not interfere with crop growth during the growing season. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

Pasture and hay plants grow well on this soil. Overgrazing, however, reduces forage production and causes surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition.

The land capability classification is I.

440A—Jasper loam, 0 to 2 percent slopes. This nearly level, well drained soil is on slight rises in the uplands. Individual areas are irregular in shape and range from 3 to 200 acres in size.

Typically, the surface soil is very dark gray, friable loam about 14 inches thick. The subsoil is about 45 inches thick. The upper part is dark yellowish brown, friable clay loam, and the lower part is brown, friable sandy clay loam. The underlying material to a depth of 70 inches or more is brown, friable, stratified sandy clay loam. In places the surface layer is thinner or lighter in color. In some areas the underlying material is calcareous sand and gravel. In other areas the subsoil is mottled.

Included with this soil in mapping are small areas of the somewhat poorly drained Brenton and La Hogue soils and the poorly drained Drummer soils. Brenton and La Hogue soils are in landscape positions similar to or slightly lower than those of the Jasper soil. Drummer soils are in broad, flat areas and in shallow depressions and drainageways below the Jasper soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Jasper soil at a moderate rate. Surface runoff is slow in cultivated areas. Available water capacity is high. Organic matter content is moderate. The potential for frost action also is moderate.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, to openland wildlife habitat, and to dwellings and septic tank absorption fields. It is moderately well suited to local roads and streets.

In the areas used for corn, soybeans, or small grain, keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

The land capability classification is I.

440B—Jasper loam, 2 to 5 percent slopes. This gently sloping, well drained soil is on side slopes and ridgetops in the uplands. Individual areas are irregular in shape and range from 3 to 90 acres in size.

Typically, the surface soil is very dark gray, friable loam about 19 inches thick. The subsoil is about 40 inches thick. The upper part is dark yellowish brown, friable clay loam, and the lower part is dark yellowish brown, very friable, stratified loam, sandy loam, and loamy sand. The underlying material to a depth of 67 inches or more is dark yellowish brown, very friable, stratified loam, sandy loam, loamy sand, and sand. In places the surface soil is thinner or lighter in color. In some areas the subsoil contains less sand and more silt or clay. In other areas the underlying material is firm, calcareous loam or silty clay loam. In a few places the underlying material is calcareous sand and gravel.

Included with this soil in mapping are small areas of the somewhat poorly drained Brenton and La Hogue soils and the poorly drained Drummer soils. Brenton and La Hogue soils are on slight rises below the Jasper soil. Drummer soils are in broad, flat areas and in shallow depressions and drainageways below the Jasper soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Jasper soil at a moderate rate. Surface runoff is medium in cultivated areas. Available water capacity is high. Organic matter content is moderate. The potential for frost action also is moderate.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, to openland wildlife habitat, and to dwellings and septic tank absorption fields. It is moderately well suited to local roads and streets.

In the areas used for corn, soybeans, or small grain, erosion is a hazard. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, or a combination of these.

The land capability classification is IIe.

440C2—Jasper loam, 5 to 10 percent slopes, eroded. This moderately sloping, well drained soil is on side slopes and ridgetops in the uplands. Individual areas are irregular in shape and range from 3 to 55 acres in size.

Typically, the surface layer is very dark grayish brown, friable loam about 7 inches thick. The subsoil is about 39 inches thick. The upper part is dark brown, friable clay loam; the next part is dark yellowish brown, friable clay loam that has strata of loam and sandy loam; and the lower part is dark brown and yellowish brown, mottled, very friable, stratified sand, sandy loam, gravelly clay loam, and loam. The underlying material to a depth of 60 inches or more is dark brown and yellowish brown, mottled, very friable, calcareous, stratified sand, sandy loam, sandy clay loam, and loam. In places the surface layer is thicker. In some areas, the slope is more than 10 percent and the soil is severely eroded. In other areas the underlying material is firm, calcareous loam.

Included with this soil in mapping are small areas of the somewhat poorly drained Brenton and La Hogue soils and the poorly drained Drummer soils. Brenton and La Hogue soils are on slight rises below the Jasper soil. Drummer soils are in broad, flat areas and in shallow depressions and drainageways below the Jasper soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Jasper soil at a moderate rate. Surface runoff is medium in cultivated areas. Available water capacity is high. Organic matter content is moderate. The potential for frost action also is moderate.

Most areas are cultivated. This soil is well suited to pasture and hay, to openland wildlife habitat, and to dwellings and septic tank absorption fields. It is moderately well suited to local roads and streets and to cultivated crops.

In the areas used for corn, soybeans, or small grain, further erosion is a hazard. A crop rotation that includes a forage crop, a system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, or a combination of these helps to keep soil loss at an acceptable level and thus maintains productivity.

The land capability classification is IIIe.

448B—Mona silt loam, 1 to 5 percent slopes. This gently sloping, moderately well drained soil is on side slopes and ridgetops in the uplands. Individual areas are irregular in shape and range from 3 to 20 acres in size.

Typically, the surface soil is very dark gray, friable silt loam about 11 inches thick. The subsoil is about 33 inches thick. In sequence downward, it is dark yellowish brown, friable silty clay loam; yellowish brown, friable clay loam; yellowish brown and light olive brown, mottled, firm clay loam; and grayish brown, mottled, very firm, calcareous silty clay. The underlying material to a depth of 60 inches or more is grayish brown, mottled, very firm, calcareous silty clay. In some areas the surface soil is thinner or lighter in color. In other areas the subsoil contains less sand. In a few areas the underlying material is noncalcareous, stratified loam and sandy loam.

Included with this soil in mapping are small areas of the poorly drained Bryce and Rowe soils and the somewhat poorly drained Clarence and Swygert soils. Bryce and Rowe soils are in broad, flat areas and in shallow depressions and drainageways below the Mona soil. Clarence and Swygert soils are on slight rises below the Mona soil. Included soils make up 5 to 15 percent of the unit.

Water and air move through the Mona soil at a moderately slow rate. Surface runoff is medium in cultivated areas. A seasonal high water table is perched at a depth of 2.5 to 4.0 feet during the spring. Available water capacity and organic matter content are moderate. The shrink-swell potential and the potential for frost action also are moderate.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to openland wildlife habitat. It is moderately well suited to dwellings and is poorly suited to septic tank absorption fields and local roads and streets.

In the areas used for corn, soybeans, or small grain, erosion is a hazard. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, or a combination of these.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. Also, the seasonal high water table is a limitation on sites for dwellings with basements. Installing underground drains around the foundations helps to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the restricted permeability and the seasonal high water table are limitations. Underground drains help to lower the water table. Enlarging the absorption area helps to overcome the moderately slow absorption of liquid waste.

The land capability classification is IIe.

473—Rossburg loam. This nearly level, well drained soil is on flood plains. It is subject to rare flooding for very brief periods from November through June. Individual areas are long and narrow or irregularly shaped and range from 3 to more than 80 acres in size.

Typically, the surface soil is very dark grayish brown, friable loam about 11 inches thick. The subsoil is brown, friable loam about 44 inches thick. The underlying material to a depth of 60 inches or more is brown, friable, stratified loam and silt loam. In places the surface soil is thicker. In some areas the surface soil and the subsoil contain less sand or more sand. In other areas the underlying material is calcareous sand and gravel.

Included with this soil in mapping are small areas of the poorly drained Ambraw and Sawmill soils and the somewhat poorly drained Shaffton soils. These soils are on flood plains below the Rossburg soil. They make up 2 to 15 percent of the unit.

Water and air move through the Rossburg soil at a moderate rate. Surface runoff is slow in cultivated areas. Available water capacity is high. Organic matter content also is high. The potential for frost action is moderate.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to woodland wildlife habitat. It is poorly suited to local roads and streets. It generally is unsuited to dwellings and septic tank absorption fields because of the flooding.

In the areas used for corn, soybeans, or small grain, flooding normally does not interfere with crop growth during the growing season. However, replanting may be necessary in some years. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

Pasture and hay plants grow well on this soil. Overgrazing reduces forage production and causes surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition. In the areas used for hay, the flooding delays harvesting in some years.

The land capability classification is I.

481—Raub silt loam. This nearly level, somewhat poorly drained soil is on slight rises on till plains and moraines. Individual areas are irregular in shape and range from 3 to more than 200 acres in size.

Typically, the surface soil is very dark gray, friable silt loam about 12 inches thick. The subsoil is about 36 inches thick. It is mottled. The upper part is dark brown and yellowish brown, firm silty clay loam, and the lower part is yellowish brown, firm clay loam. The underlying material to a depth of 60 inches or more is yellowish brown, mottled, firm, calcareous loam. In places the surface soil is thinner. In some areas the lower part of the subsoil contains less sand and more silt. In other areas part of the underlying material is brown, stratified loam, sandy loam, and sand.

Included with this soil in mapping are small areas of the moderately well drained Dana, poorly drained Drummer, and well drained Parr soils. Dana and Parr soils are on ridgetops and side slopes above the Raub soil. Drummer soils are in broad, flat areas and in shallow depressions and drainageways below the Raub soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Raub soil at a moderately slow rate. Surface runoff is slow in cultivated areas. A seasonal high water table is 1 to 3 feet below the surface during the spring. Available water capacity is high. Organic matter content also is high. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to openland wildlife habitat. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

In the areas used for corn, soybeans, or small grain, a drainage system may be needed. Tile drains and surface drains function satisfactorily if suitable outlets are available. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

In the areas used for corn, soybeans, or small grain, a drainage system may be needed. Tile drains and surface drains function satisfactorily if suitable outlets are available. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

If this soil is used as a site for dwellings, the seasonal high water table and the shrink-swell potential are limitations. Installing underground drains around the foundations helps to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table and the moderately slow permeability are limitations. Underground drains help to lower the water table. Enlarging the absorption area helps to overcome the moderately slow absorption of liquid waste.

The land capability classification is IIw.

490—Odell loam. This nearly level, somewhat poorly drained soil is on slight rises on till plains and moraines. Individual areas are irregular in shape and range from 3 to 80 acres in size.

Typically, the surface soil is very dark gray, friable loam about 11 inches thick. The subsoil is about 23 inches thick. It is mottled. The upper part is olive brown, friable clay loam, and the lower part is light olive brown, firm, calcareous loam. The underlying material to a depth of 60 inches or more is grayish brown, mottled, firm, calcareous loam. In some areas the subsoil contains less sand and more silt or more clay. In other areas the subsoil and underlying material are stratified loam, sandy loam, and loamy sand.

Included with this soil in mapping are small areas of the moderately well drained Corwin and poorly drained Drummer soils. Corwin soils are on side slopes and ridgetops above the Odell soil. Drummer soils are in broad, flat areas and in shallow depressions and drainageways below the Odell soil. Included soils make up 2 to 15 percent of the unit.

Water and air move through the Odell soil at a moderately slow rate. Surface runoff is slow in cultivated areas. A seasonal high water table is 1 to 3 feet below the surface during the spring. Available water capacity is moderate. Organic matter content is high. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to openland wildlife habitat. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

In the areas used for corn, soybeans, or small grain, a drainage system may be needed. Tile drains and surface drains function satisfactorily if suitable outlets are available. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

If this soil is used as a site for dwellings, the seasonal high water table is a limitation. Also, the shrink-swell potential is a limitation on sites for dwellings without basements. Installing underground drains around the foundations helps to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table and the moderately slow permeability are limitations. Underground drains help to lower the water table. Enlarging the absorption area helps to overcome the moderately slow absorption of liquid waste.

The land capability classification is IIw.

495B2—Corwin silt loam, 2 to 5 percent slopes, eroded. This gently sloping, moderately well drained soil is on side slopes and ridgetops on till plains and moraines. Individual areas are irregular in shape and range from 3 to 100 acres in size.

Typically, the surface soil is very dark gray, friable silt loam about 8 inches thick. The subsoil is friable clay loam about 26 inches thick. The upper part is brown, and the lower part is olive brown and is mottled. The underlying material to a depth of 60 inches or more is olive brown, mottled, firm, calcareous loam. In places the surface layer is thicker. In some areas the underlying material is noncalcareous, stratified loam and sandy loam. In other areas the subsoil is thicker.

Included with this soil in mapping are small areas of the poorly drained Drummer soils and the somewhat poorly drained Lisbon and Odell soils. Drummer soils are in broad, flat areas and in shallow depressions and drainageways below the Corwin soil. Lisbon and Odell soils are on slight rises below the Corwin soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Corwin soil at a moderately slow rate. Surface runoff is medium in cultivated areas. The seasonal high water table is 2 to 4 feet below the surface during the spring. Available water capacity and organic matter content are moderate. The shrink-swell potential and the potential for frost action also are moderate.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to openland wildlife habitat. It is moderately well suited to dwellings and is poorly suited to septic tank absorption fields and local roads and streets.

In the areas used for corn, soybeans, or small grain, erosion is a hazard. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, or a combination of these.

If this soil is used as a site for dwellings with basements, the seasonal high water table is a limitation. Installing underground drains around the foundations helps to lower the water table. If the soil is used as a site for dwellings without basements, the shrink-swell potential is a limitation. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table and the moderately slow permeability are limitations. The septic system functions properly only if the water table is lowered or the distribution lines are installed closer to the surface than is typical. Enlarging the absorption field helps to overcome the moderately slow absorption of liquid waste.

The land capability classification is IIe.

496A—Fincastle silt loam, 0 to 2 percent slopes. This nearly level, somewhat poorly drained soil is on slight rises on till plains and moraines. Individual areas are irregular in shape and range from 5 to more than 200 acres in size.

Typically, the surface soil is dark grayish brown, friable silt loam about 10 inches thick. The subsoil is about 39 inches thick. It is mottled. The upper part is dark brown and dark yellowish brown, friable silty clay loam; the next part is dark yellowish brown, friable silty clay loam; and the lower part is olive brown, friable, calcareous clay loam. The underlying material to a depth of 60 inches or more is light olive brown, mottled, firm, calcareous loam. In places the surface layer is thicker and darker. In a few areas the underlying material is stratified loam and sandy loam. In the area north of Danville, the subsoil is thinner and the underlying material is calcareous silty clay loam.

Included with this soil in mapping are small areas of the poorly drained Ashkum and Drummer soils and the moderately well drained Xenia soils. Ashkum and Drummer soils are in shallow depressions and drainageways below the Fincastle soil. Xenia soils are on side slopes and ridgetops above the Fincastle soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Fincastle soil at a moderately slow rate. Surface runoff is slow in cultivated areas. A seasonal high water table is 1 to 3 feet below the surface during the spring. Available water capacity is high. Organic matter content is moderately low. In cultivated areas the surface layer tends to crust and puddle after hard rains. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to openland wildlife habitat. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

This soil is sufficiently drained for the commonly grown crops. Measures that maintain or improve the drainage system are needed. Tile drains and surface drains function satisfactorily if suitable outlets are available. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility and prevent surface crusting.

Pasture and hay plants grow well on this soil. Overgrazing or grazing when the soil is too wet, however, reduces forage production and causes surface compaction, excessive runoff, and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition. Leaving unmowed strips, 30 to 50 feet wide, at the edge of hayland provides excellent nesting cover for openland wildlife.

If this soil is used as a site for dwellings or septic tank absorption fields, the seasonal high water table is a limitation. Also, the moderately slow permeability is a limitation on sites for septic tank absorption fields. Underground drains help to lower the water table. Enlarging the absorption area helps to overcome the moderately slow absorption of liquid waste.

The land capability classification is IIw.

496B2—Fincastle silt loam, 2 to 6 percent slopes, eroded. This gently sloping, somewhat poorly drained soil is on side slopes and ridgetops on till plains and moraines. Individual areas are irregular in shape and range from 5 to 50 acres in size.

Typically, the surface soil is brown, friable silt loam about 7 inches thick. The subsoil is about 46 inches thick. It is mottled. The upper part is brown, friable silty clay loam, and the lower part is light olive brown, friable clay loam and loam. The underlying material to a depth of 60 inches or more is light olive brown, mottled, friable, calcareous loam. In places the soil is not eroded. In some areas the upper part of the subsoil is not mottled. In other areas, the lower part of the subsoil contains less sand and part of the underlying material is calcareous silt loam. In the area north of Danville, the subsoil is thinner and the underlying material is calcareous silty clay loam.

Included with this soil in mapping are small areas of the poorly drained Ashkum and Drummer soils in shallow depressions and drainageways below the Fincastle soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Fincastle soil at a moderately slow rate. Surface runoff is medium in cultivated areas. A seasonal high water table is 1 to 3 feet below the surface during the spring. Available water capacity is high. Organic matter content is moderately low. In cultivated areas the surface layer tends to crust and puddle after hard rains. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to openland wildlife habitat. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

This soil is sufficiently drained for the commonly grown crops. Measures that maintain or improve the drainage system are needed. Tile drains and surface drains function satisfactorily if suitable outlets are available. In the areas used for corn, soybeans, or small grain, erosion is a hazard. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, or a combination of these. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility and prevent surface crusting.

Pasture and hay plants grow well on this soil. Overgrazing or grazing when the soil is too wet, however, reduces forage production and causes surface compaction, excessive runoff, and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition. Leaving unmowed strips, 30 to 50 feet wide, at the edge of hayland provides excellent nesting cover for openland wildlife.

If this soil is used as a site for dwellings or septic tank absorption fields, the seasonal high water table is a limitation. Also, the moderately slow permeability is a limitation on sites for septic tank absorption fields. Underground drains help to lower the water table. Enlarging the absorption area helps to overcome the moderately slow absorption of liquid waste.

The land capability classification is IIe.

533—Urban land. This map unit consists of areas covered by pavement and buildings. Because of extensive land smoothing, it generally is nearly level or gently sloping. Most of the areas are in downtown Hoopeston and Danville. They commonly are rectangular, but some are long and narrow. Typically, they are 5 to 100 acres in size.

More than 85 percent of this map unit is covered by buildings and pavement. Most of the paved areas are parking lots adjacent to shopping centers, industrial plants, and other commercial buildings.

Included in mapping are small areas of Ashkum, Drummer, Elliott, and Flanagan soils and Orthents. The poorly drained Ashkum and Drummer soils are in slight depressions and drainageways. The somewhat poorly drained Elliott and Flanagan soils are on slight rises. Orthents are soils that have been extensively modified by cutting and filling. Included soils make up less than 15 percent of the unit.

Runoff generally is very rapid on the Urban land. Because of the design of most paved areas, the water commonly is diverted to storm drainage systems. In some areas, however, it is diverted to areas of adjacent soils. Controlling runoff reduces the hazard of erosion in adjacent areas and helps to control local flooding.

No land capability classification is assigned.

536—Dumps, mine. This map unit consists of nearly level to very steep piles of industrial refuse, mine spoil, and slag. Most areas of industrial refuse and slag are in the urbanized east-central part of the county. Mine spoil is mainly in the southern part of the county. Individual areas of this unit are irregularly shaped or are oval or blocky and range from 5 to 80 acres in size.

Mine spoil consists of waste from coal mines. These areas support little or no vegetation because of very strong acidity.

Industrial refuse and slag piles consist of waste materials from industrial factories. These areas do not support vegetation.

Included in mapping are small areas of Orthents. These soils are in border areas that have been cut and filled with loamy soil material. They make up 10 to 15 percent of the unit.

No land capability classification is assigned.

549G—Marseilles loam, 40 to 80 percent slopes. This very steep, moderately deep, well drained soil is on side slopes in the uplands. Individual areas are long and narrow and range from 3 to 200 acres in size.

Typically, the surface soil is very dark gray, friable loam about 3 inches thick. The subsurface layer is dark grayish brown, friable loam about 3 inches thick. The subsoil is about 20 inches thick. The upper part is dark grayish brown, friable loam; the next part is dark brown, friable silt loam; and the lower part is grayish brown, mottled, firm and friable silt loam. Below this is about 2 inches of gray and yellowish brown, extremely hard, weakly cemented siltstone and sandstone. Siltstone bedrock is at a depth of about 25 inches. Some areas are less sloping or more sloping. A few areas are severely eroded. In some places, the subsoil is thicker and the depth to bedrock is greater. In a few places the soil contains less silt and more sand or clay.

Included with this soil in mapping are small areas of the well drained Landes and moderately well drained Xenia soils. Landes soils are on flood plains below the Marseilles soil. Xenia soils are on side slopes and ridgetops above the Marseilles soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the upper part of the Marseilles soil at a moderate rate and through the underlying material at a slow rate. Surface runoff is very rapid in wooded areas. Available water capacity is low. Organic matter content is moderately low. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are wooded. This soil is well suited to woodland wildlife habitat and is moderately well suited to woodland. It generally is unsuited to cultivated crops, to pasture and hay, and to dwellings, septic tank absorption fields, and local roads and streets because of the slope.

If this soil is used as woodland, the erosion hazard and the equipment limitation are management concerns because of the slope. Bare logging areas should be seeded to grass or to a grass-legume mixture. The use of machinery should be limited to periods when the soil is firm enough to support the equipment. The seedling mortality rate can be reduced by planting stock that is larger than typical. Harvesting methods that do not leave the remaining trees isolated or widely spaced reduce the windthrow hazard. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.

The land capability classification is VIIe.

570B—Martinsville loam, 2 to 5 percent slopes. This gently sloping, well drained soil is on side slopes and ridgetops on outwash plains and stream terraces. Individual areas are irregularly shaped or oblong and range from 3 to 35 acres in size.

Typically, the surface soil is dark brown, very friable loam about 7 inches thick. The subsoil is about 51 inches thick. The upper part is dark yellowish brown, very friable loam; the next part is dark yellowish brown, friable sandy loam and clay loam; and the lower part is dark yellowish brown and yellowish brown, very friable, stratified sandy clay loam and sandy loam. The underlying material to a depth of 65 inches or more is yellowish brown, loose, stratified loamy sand and sandy loam. In places the surface soil is darker. In some areas the underlying material is firm, calcareous loam. In other areas the upper part of the subsoil contains less sand and more silt.

Included with this soil in mapping are small areas of the poorly drained Drummer and somewhat poorly drained Kendall soils. Drummer soils are in shallow depressions and drainageways below the Martinsville soil. Kendall soils are on slight rises below the Martinsville soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Martinsville soil at a moderate rate. Surface runoff is medium in cultivated areas. Available water capacity is high. Organic matter content is moderately low. In cultivated areas the surface layer tends to crust and puddle after hard rains. The shrink-swell potential and the potential for frost action are moderate.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, to openland wildlife habitat, to dwellings with basements, and to septic tank absorption fields. It is moderately well suited to dwellings without basements and to local roads and streets.

In the areas used for corn, soybeans, or small grain, erosion is a hazard. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, or a combination of these. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility and prevent surface crusting.

Establishing pasture or hay plants on this soil helps to keep erosion within tolerable limits. Overgrazing, however, reduces forage yields and causes surface compaction, which results in excessive runoff and poor tilth and increases the hazard of erosion. Proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to control erosion. Leaving unmowed strips, 30 to 50 feet wide, at the edge of hayland provides excellent nesting cover for openland wildlife.

If this soil is used as a site for dwellings without basements, the shrink-swell potential is a limitation. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

The land capability classification is IIe.

570C2—Martinsville loam, 5 to 12 percent slopes, eroded. This moderately sloping, well drained soil is on side slopes and ridgetops on outwash plains and stream terraces. Individual areas are irregularly shaped or oblong and range from 3 to 40 acres in size.

Typically, the surface layer is dark grayish brown and brown, friable loam about 10 inches thick. The subsoil is about 30 inches thick. The upper part is dark yellowish brown, friable clay loam and loam, and the lower part is brown, friable sandy loam. The underlying material to a depth of 72 inches or more is mottled yellowish brown and dark grayish brown, stratified sandy loam, sandy clay loam, and silt loam. In some areas the underlying material is firm, calcareous loam. In a few places the underlying material is calcareous sand and gravel. In some places the subsoil contains less sand and more silt.

Included with this soil in mapping are small areas of the poorly drained Drummer and somewhat poorly drained Kendall soils. Drummer soils are in shallow depressions and drainageways below the Martinsville soil. Kendall soils are on slight rises above or below the Martinsville soil. Included soils make up 5 to 10 percent of the unit.

Water and air move through the Martinsville soil at a moderate rate. Surface runoff is medium in cultivated areas. Available water capacity is high. Organic matter content is moderately low. In cultivated areas the surface layer tends to crust and puddle after hard rains. The shrink-swell potential and the potential for frost action are moderate.

Most areas are cultivated or are used for pasture and hay. This soil is well suited to pasture and hay, woodland wildlife habitat, septic tank absorption fields, dwellings with basements, and woodland. It is moderately well suited to cultivated crops, dwellings without basements, and local roads and streets.

In the areas used for corn, soybeans, or small grain, further erosion is a hazard. A crop rotation that includes a forage crop, a system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, or a combination of these helps to keep soil loss at an acceptable level and thus maintains productivity. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility and prevent surface crusting.

Establishing pasture or hay plants on this soil helps to keep erosion within tolerable limits. Overgrazing, however, reduces forage production and causes surface compaction, which results in excessive runoff and poor tilth and increases the hazard of erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to control erosion.

If this soil is used as a site for dwellings without basements, the shrink-swell potential is a limitation. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

The land capability classification is IIIe.

570F—Martinsville sandy loam, 16 to 35 percent slopes. This steep, well drained soil is on side slopes on outwash plains and stream terraces. Individual areas are long and narrow or irregularly shaped and range from 3 to 20 acres in size.

Typically, the surface layer is very dark grayish brown, friable sandy loam about 4 inches thick. The subsurface layer is dark brown, friable sandy loam about 3 inches thick. The subsoil is about 42 inches thick. The upper part is dark yellowish brown, friable sandy clay loam; the next part is yellowish brown, friable, stratified sandy clay loam and sandy loam; and the lower part is yellowish brown, friable, stratified sandy loam and loam. The underlying material to a depth of 60 inches or more is yellowish brown, very friable, stratified sandy loam, loamy sand, and sand. In some areas the soil is eroded. In some places the subsoil and underlying material are very gravelly. A few areas are very steep.

Included with this soil in mapping are small areas of the well drained Landes and somewhat poorly drained Shaffton soils. These soils are on flood plains below the Martinsville soil. They make up 5 to 10 percent of the unit.

Water and air move through the Martinsville soil at a moderate rate. Surface runoff is very rapid in wooded areas. Available water capacity is high. Organic matter content is moderately low. The shrink-swell potential and the potential for frost action are moderate.

Most areas are wooded. This soil is well suited to woodland wildlife habitat and is moderately well suited to woodland. It is poorly suited to dwellings, septic tank absorption fields, local roads and streets, and pasture. It generally is unsuited to cultivated crops and hay because of the slope.

Establishing pasture plants on this soil helps to keep erosion within tolerable limits. Overgrazing, however, reduces forage production and causes surface compaction, which results in excessive runoff and poor tilth and increases the hazard of erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to control erosion.

If this soil is used as woodland, plant competition is a management concern. It affects seedlings of desirable species. Bare logging areas should be seeded to grass or to a grass-legume mixture. In openings where timber has been harvested, competition from undesirable vegetation can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.

If this soil is used as a site for dwellings or septic tank absorption fields, the slope is a limitation. Also, the shrink-swell potential is a limitation on sites for dwellings without basements. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling. Cutting and filling help to overcome the slope. Installing septic system filter lines on the contour helps to evenly distribute the liquid waste.

The land capability classification is VIIe.

571—Whitaker loam. This nearly level, somewhat poorly drained soil is on slight rises on outwash plains and stream terraces. Individual areas are irregular in shape and range from 5 to 100 acres in size.

Typically, the surface soil is dark grayish brown, friable loam about 10 inches thick. The subsoil is about 44 inches thick. It is dark grayish brown, grayish brown, and yellowish brown and is mottled. The upper part is friable loam and clay loam, and the lower part is friable, stratified sandy loam, loamy sand, and loam. The underlying material to a depth of 60 inches or more is dark yellowish brown, mottled, friable, stratified sandy loam, loamy sand, and loam. In places the surface layer is firm and is thicker and darker. In a few areas the underlying material is firm, calcareous loam or silty clay loam. In some places the subsoil contains less sand and more silt.

Included with this soil in mapping are small areas of the poorly drained Drummer and well drained Martinsville soils. Drummer soils are in shallow depressions and drainageways below the Whitaker soil. Martinsville soils are on side slopes and ridgetops above the Whitaker soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Whitaker soil at a moderate rate. Surface runoff is slow in cultivated areas. A seasonal high water table is 1 to 3 feet below the surface during the spring. Available water capacity is high. Organic matter content is moderately low. In cultivated areas the surface layer tends to crust and puddle after hard rains. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to openland wildlife habitat. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

This soil is sufficiently drained for the commonly grown crops. Measures that maintain or improve the drainage system are needed. Tile drains and surface drains function satisfactorily if suitable outlets are available. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility and prevent surface crusting.

Pasture and hay plants grow well on this soil. Overgrazing or grazing when the soil is too wet, however, reduces forage production and causes surface compaction, excessive runoff, and poor tilth. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition. Leaving unmowed strips, 30 to 50 feet wide, at the edge of hayland provides excellent nesting cover for openland wildlife.

If this soil is used as a site for dwellings or septic tank absorption fields, the seasonal high water table is a limitation. Also, the shrink-swell potential is a limitation on sites for dwellings. Underground drains help to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

The land capability classification is IIw.

802B—Orthents, loamy, undulating. These moderately fine textured to moderately coarse textured, moderately well drained and somewhat poorly drained soils formed in material modified by cutting, filling, and leveling. Slope ranges from 1 to 7 percent. Individual areas are rectangular or irregularly shaped and range from 3 to more than 50 acres in size.

These soils are in residential and industrial areas, near interstate interchanges and airports, along railroads, and in fill areas. Typically, the surface layer is grayish brown, friable clay loam about 10 inches thick. The underlying material to a depth of 60 inches or more is layers of grayish brown, brown, yellowish brown, and very dark gray, firm clay loam and loam. In places the soils and underlying material are sandy or clayey. In some areas materials modified by cutting, filling, and leveling are less than 20 inches thick.

Included with these soils in mapping are areas covered by buildings, streets, and parking lots. Also included are some poorly drained areas in drainageways. Included areas make up 2 to 25 percent of the unit.

Water and air move through the Orthents at a varying rate, depending largely on the degree of compaction by construction equipment. Surface runoff is medium. A seasonal high water table is 1 to 6 feet below the surface during the spring. Available water capacity is moderate. Organic matter content and fertility are low.

Most areas are idle or are developed for residential or other nonfarm uses. The plant cover ranges from none in newly exposed areas to a good cover of sod in developed areas. Onsite investigation is needed to determine the limitations or hazards affecting the development of areas for specific uses.

No land capability classification is assigned.

802F—Orthents, loamy, steep. These moderately fine textured to moderately coarse textured, well drained soils have been modified by cutting, filling, and leveling. Slope ranges from 20 to 40 percent. Individual areas are rectangular or irregularly shaped and range from 3 to more than 30 acres in size.

These soils are along interstate highways and railroads, in revegetated gravel pits, and in fill areas. Typically, the surface layer is dark yellowish brown, friable clay loam about 5 inches thick. The underlying material, to a depth of 32 inches, is layers of brown and dark brown, friable loam, clay loam, and silty clay loam. Below this to a depth of 60 inches or more is a buried subsoil of dark yellowish brown, friable silty clay loam and silt loam. In places the buried soil is at a depth of more than 60 inches or less than 20 inches.

Included with these soils in mapping are highway surfaces, gravel pits, and a few small intermittent water bodies. Included areas make up 10 to 25 percent of the unit.

Water and air move through the Orthents at a varying rate, depending largely on the degree of compaction by construction equipment. Surface runoff is very rapid.

Available water capacity is moderate. Organic matter content and fertility are low.

Most areas are idle and are vegetated. Areas along interstate highways are seeded to grasses and legumes, which help to control erosion. Other areas are covered with trees, shrubs, herbaceous plants, and grasses. Unless a good plant cover protects the surface, erosion is a severe hazard. Special management is needed to establish and maintain the plant cover. Onsite investigation is needed to determine the limitations or hazards affecting the development of areas for specific uses.

No land capability classification is assigned.

864—Pits, quarry. This map unit consists of excavations from which limestone has been removed. The bottom of the quarries generally is nearly level or gently sloping. The sides are nearly vertical. Individual areas are mainly rectangular.

The bottom and side walls are mainly exposed limestone bedrock. Strips of soil material are generally along the tops of the side walls, and a talus slope is along the bottom in places.

Included in mapping are roads used for hauling the quarried material, stockpiles of crushed limestone, and some areas covered with machinery and debris. Included areas make up 10 to 15 percent of the unit.

Runoff is medium in most areas but is ponded in depressional areas. Except for the bands of soil material along the tops of the side walls, this map unit supports little or no vegetation.

This map unit is actively mined for limestone. It is poorly suited to most other uses. Some areas are suitable for paths and trails. Some depressional areas are suitable for pond reservoir areas. Falling rock is a hazard.

No land capability classification is assigned.

865—Pits, gravel. This map unit consists of excavations from which gravel has been removed and from which some sand has been removed. It generally is on outwash plains, on terraces near streams, or on kames. The gravel is used mainly as roadfill or other construction material. Individual areas are rectangular or irregularly shaped and range from 3 to more than 40 acres in size.

The excavations commonly are 10 to 30 feet deep. A few areas are filled with water. The surrounding soil material generally was leveled or mixed with sand and gravel during mining operations. It is mainly low in fertility and organic matter content. Available water capacity varies.

Some abandoned pits can be filled with solid refuse and then covered with clean fill material. The fill should settle and be allowed to become stable before it is graded. If reclaimed, some areas are suitable for recreational uses, such as hiking paths and trails and fishing areas, or for commercial and industrial uses. Topdressing generally is needed to establish vegetation. The feasibility of reclamation depends on the condition at the site and the proposed alternative use. Onsite investigation is needed to plan the development for a specific use.

No land capability classification is assigned.

871B—Lenzburg loam, 1 to 7 percent slopes. This gently sloping, well drained soil is in low areas and on ridgetops in surface-mined areas. Individual areas are irregular in shape and range from 3 to 100 acres in size.

Typically, the surface layer is very dark grayish brown, friable loam about 2 inches thick. The upper part of the underlying material is dark grayish brown, mottled, firm, calcareous, mixed loam till and clay. The lower part of the underlying material to a depth of 60 inches or more is mixed dark grayish brown and light gray, mottled, firm, calcareous loam till and clay. Shale and coal channers are common throughout the soil. In some areas the surface layer is gravelly. In other areas the soil is severely eroded.

Included with this soil in mapping are somewhat poorly drained and poorly drained areas, small areas of haulage roads, water areas, and some steep and very steep areas. Included areas make up 10 to 15 percent of the unit.

Water and air move through the Lenzburg soil at a moderately slow rate. Surface runoff is medium. Available water capacity is moderate. Organic matter content is low. Available phosphorus is low. The content of rock fragments ranges from 10 to 35 percent, by volume, in the underlying material. Some areas may be subject to differential settling. The shrink-swell potential and the potential for frost action are moderate.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to openland wildlife habitat. It is moderately well suited to dwellings and is poorly suited to septic tank absorption fields and local roads and streets.

Pasture and hay plants grow well on this soil. Erosion is a hazard. The short slopes, the depressions, and the stones on the surface are limitations. Overgrazing reduces forage production and causes surface compaction, excessive runoff, and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to control erosion. Using a no-till method of pasture renovation and seeding on the contour reduce the hazard of erosion during forage establishment. Some seeding and fertilizing by airplane or by hand may be needed in certain areas.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the moderately slow permeability is a limitation. Enlarging the absorption area helps to overcome the moderately slow absorption of liquid waste.

The land capability classification is IIe.

871G3—Lenzburg gravelly loam, gullied, 20 to 70 percent slopes. This very steep, well drained soil is on side slopes in surface-mined areas. Individual areas are long and narrow or irregularly shaped and range from 3 to more than 500 acres in size.

Typically, the surface layer is very dark grayish brown, friable gravelly loam about 1 inch thick. The upper part of the underlying material is mixed gray, strong brown, and light gray, mottled, firm, calcareous gravelly loam, gravelly sandy loam, and clay. The lower part is mixed gray and light gray, mottled, firm, calcareous gravelly loam, clay, and channery loam. A few areas are less sloping or more sloping. In some places the soil is not gullied.

Included with this soil in mapping are shallow depressions and trenches, many of which contain water. Also included are haulage roads and small nearly level areas. Included areas make up 10 to 15 percent of the unit.

Water and air move through the Lenzburg soil at a moderately slow rate. Surface runoff is very rapid. Available water capacity is moderate. Organic matter content is very low. Available phosphorus is low. The content of rock fragments ranges from 10 to 35 percent, by volume, in the underlying material. Some areas may be subject to differential settling and slumping. The shrink-swell potential and the potential for frost action are moderate.

Most areas are idle. Some areas are wooded. Other areas are used for recreation. This soil is well suited to woodland wildlife habitat. It is moderately well suited to woodland and is poorly suited to openland wildlife habitat. It generally is unsuited to cultivated crops, to pasture and hay, to local roads and streets, and to dwellings and septic tank absorption fields because of the slope and the gullies.

If this soil is used as woodland, the erosion hazard and the equipment limitation are management concerns because of the slope and the gullies. Plant competition is also a management concern. It affects seedlings of desirable species. Bare logging areas should be seeded to grass or to a grass-legume mixture. The use of machinery should be limited to periods when the soil is firm enough to support the equipment. In openings where timber has been harvested, competition from undesirable vegetation can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.

The land capability classification is VIIe.

2023B—Blount-Urban land complex, 1 to 6 percent slopes. This map unit occurs as gently sloping areas of a somewhat poorly drained Blount soil intermingled with areas of Urban land. It is on slight rises and low ridges on till plains and moraines. Individual areas range from 5 to more than 200 acres in size. They are 40 to 55 percent Blount soil and 35 to 45 percent Urban land. The Blount soil and the Urban land occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the Blount soil has a surface layer of mixed very dark grayish brown and dark yellowish brown, friable silt loam about 7 inches thick. The subsurface layer is brown, friable silt loam about 7 inches thick. The subsoil is silty clay loam about 36 inches thick. The upper part is dark yellowish brown, the next part is olive brown and is mottled, and the lower part is light olive brown and is mottled. The underlying material to a depth of 60 inches or more is light olive brown, mottled, very firm, calcareous silty clay loam. In some areas the lower part of the subsoil and the underlying material are stratified loam and sandy loam. In a few places the subsoil contains less clay and more silt. Small areas have been cut, built up, or smoothed during construction.

The Urban land consists of streets, parking lots, buildings, and other structures.

Included in mapping are small areas of the poorly drained Ashkum and moderately well drained Morley soils. Ashkum soils are in shallow depressions and drainageways below the Blount soil. Morley soils are on ridgetops above the Blount soil or on side slopes below the Blount soil. Included soils make up 15 to 25 percent of the unit.

Water and air move through the Blount soil at a slow or moderately slow rate. Surface runoff is medium. A seasonal high water table is 1 to 3 feet below the surface during the spring. Available water capacity is moderate. Organic matter content is moderately low. The shrink-swell potential is moderate, and the potential for frost action is high.

Areas of the Blount soil are used for parks, building site development, lawns, and gardens. This soil is moderately well suited to vegetable and flower gardens, ornamental trees and shrubs, lawns and landscaping, and recreational uses. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets. Erosion is a hazard in areas where the surface is left bare for considerable periods. Establishing a vegetative cover helps to control erosion.

If the Blount soil is used as a site for dwellings, the seasonal high water table and the shrink-swell potential are limitations. Installing underground drains around the foundations helps to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

In most areas access to municipal sanitary facilities is available. In other areas, the seasonal high water table and the restricted permeability are limitations if the Blount soil is used as a site for septic tank absorption fields. Underground drains help to lower the water table. Enlarging the absorption field helps to overcome the slow or moderately slow absorption of liquid waste.

Low strength and the potential for frost action are limitations if the Blount soil is used as a site for local roads and streets. Providing suitable subgrade material helps to prevent the damage caused by low strength and by frost action. Installing a drainage system and grading the roads so that they shed water reduce wetness and help to prevent the damage caused by frost action.

No land capability classification is assigned.

2146A—Elliott-Urban land complex, 0 to 3 percent slopes. This map unit occurs as nearly level areas of a somewhat poorly drained Elliott soil intermingled with areas of Urban land. It is on slight rises and low ridges on till plains and moraines. Individual areas range from 5 to more than 100 acres in size. They are 40 to 55 percent Elliott soil and 35 to 45 percent Urban land. The Elliott soil and the Urban land occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the Elliott soil has a surface soil of black and very dark grayish brown, friable silt loam and silty clay loam about 18 inches thick. The subsoil is about 21 inches thick. It is mottled. The upper part is olive brown, firm silty clay, and the lower part is light olive brown, firm, calcareous silty clay loam. The underlying material to a depth of 60 inches or more is light olive brown, mottled, firm, calcareous silty clay loam. In a few places the subsoil and underlying material are stratified loam and sandy loam. Small areas have been cut, built up, or smoothed during construction.

The Urban land consists of streets, parking lots, buildings, and other structures.

Included in mapping are small areas of the poorly drained Ashkum and moderately well drained Varna soils. Ashkum soils are in shallow depressions and drainageways below the Elliott soil. Varna soils are on side slopes and ridgetops above the Elliott soil. Included soils make up 15 to 25 percent of the unit.

Water and air move through the Elliott soil at a slow or moderately slow rate. Surface runoff is slow. A seasonal high water table is 1 to 3 feet below the surface during the spring. Available water capacity is high. Organic matter content also is high. The surface layer and the subsoil are neutral or mildly alkaline. The shrink-swell potential is moderate, and the potential for frost action is high.

Areas of the Elliott soil are used for parks, building site development, lawns, and gardens. This soil is moderately well suited to vegetable and flower gardens, ornamental trees and shrubs, lawns and landscaping, and recreational uses. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets. Erosion is a hazard in areas where the surface is left bare for considerable periods. Establishing a vegetative cover helps to control erosion.

If the Elliott soil is used as a site for dwellings, the seasonal high water table and the shrink-swell potential are limitations. Installing underground drains around the foundations helps to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

In most areas access to municipal sanitary facilities is available. In other areas, the seasonal high water table and the restricted permeability are limitations if the Elliott soil is used as a site for septic tank absorption fields. Underground drains help to lower the water table. Enlarging the absorption field helps to overcome the slow or moderately slow absorption of liquid waste.

Low strength and the potential for frost action are limitations if the Elliott soil is used as a site for local roads and streets. Providing suitable subgrade material helps to prevent the damage caused by low strength and by frost action. Installing a drainage system and grading the roads so that they shed water reduce wetness and help to prevent the damage caused by frost action.

No land capability classification is assigned.

2152—Drummer-Urban land complex. This map unit occurs as nearly level areas of a poorly drained Drummer soil intermingled with areas of Urban land. It is in broad, flat areas and in shallow depressions and drainageways on uplands. It is occasionally ponded for brief periods in the winter and spring. Individual areas range from 5 to more than 200 acres in size. They are 45 to 60 percent Drummer soil and 25 to 40 percent Urban land. The Drummer soil and the Urban land occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the Drummer soil has a surface soil of black, friable silty clay loam about 16 inches thick. The subsoil is about 44 inches thick. The upper part is dark grayish brown and grayish brown, mottled, friable silty clay loam, and the lower part is grayish brown, mottled, friable, stratified loam. In a few areas the surface soil is thicker and contains less clay and more silt. Some of the lower areas have been filled or leveled during construction. Other small areas have been cut, built up, or smoothed.

The Urban land consists of streets, parking lots, buildings, and other structures.

Included in mapping are small areas of the well drained Camden and somewhat poorly drained Kendall soils. Camden soils are on side slopes below the Drummer soil and on ridgetops above the Drummer soil. Kendall soils are on slight rises above the Drummer soil. Included soils make up 10 to 25 percent of the unit.

Water and air move through the Drummer soil at a moderate rate. Surface runoff is slow. A seasonal high water table is 0.5 foot above to 2.0 feet below the surface during the spring. Available water capacity is high. Organic matter content also is high. The shrink-swell potential is moderate, and the potential for frost action is high.

Areas of the Drummer soil are used for parks, building site development, lawns, and gardens. This soil is poorly suited to dwellings, local roads and streets, and septic tank absorption fields. Because of the seasonal wetness, it is poorly suited to lawns and landscaping, vegetable and flower gardens, ornamental trees and shrubs, and recreational uses. Underground drains help to lower the water table, and surface drains help to overcome the wetness. Erosion is a hazard in areas where the surface is left bare and in areas used as watercourses. Establishing a vegetative cover helps to control erosion.

If the Drummer soil is used as a site for dwellings, the ponding and the shrink-swell potential are management concerns. Underground drains help to lower the water table, and surface drains help to control the ponding. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

In most areas access to municipal sanitary facilities is available. In other areas, the ponding and the moderate permeability are management concerns if the Drummer soil is used as a site for septic tank absorption fields. A drainage system is needed. Also, adding as much as 2 feet of loamy fill material increases the depth to the seasonal water table. Enlarging the absorption area helps to overcome the moderate absorption of liquid waste.

Low strength, ponding, frost action, and shrinking and swelling are problems if the Drummer soil is used as a site for local roads and streets. Providing suitable subgrade material helps to prevent the damage caused by low strength, frost action, and shrinking and swelling. Installing a drainage system and grading the roads so that they shed water help to prevent the damage caused by ponding and by frost action.

No land capability classification is assigned.

2232—Ashkum-Urban land complex. This map unit occurs as nearly level areas of a poorly drained Ashkum soil intermingled with areas of Urban land. It is in broad, flat areas and in shallow depressions and drainageways on till plains and moraines. It is occasionally ponded for brief periods in winter and spring. Individual areas range from 5 to more than 200 acres in size. They are 45 to 60 percent Ashkum soil and 25 to 40 percent Urban land. The Ashkum soil and the Urban land occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the Ashkum soil has a surface layer of black, friable silty clay loam about 10 inches thick. The subsurface layer is black, mottled, friable silty clay loam about 7 inches thick. The subsoil is grayish brown, mottled silty clay loam about 42 inches thick. The upper part is friable, and the lower part is firm. The underlying material to a depth of 60 inches or more is grayish brown, mottled, firm, calcareous silty clay loam. In a few areas the subsoil and underlying material are stratified loam and sandy loam. In some places the surface soil is thicker and contains less clay and more silt. Small areas have been cut, built up, or smoothed during construction.

The Urban land consists of streets, parking lots, buildings, and other structures.

Included in mapping are small areas of the somewhat poorly drained Blount and Elliott soils. These soils are on slight rises and low ridges above the Ashkum soil. They make up 10 to 25 percent of the unit.

Water and air move through the Ashkum soil at a moderately slow rate. Surface runoff is slow. A seasonal high water table is 1 foot above to 2 feet below the surface during the spring. Available water capacity and organic matter content are high. The shrink-swell potential and the potential for frost action also are high.

Areas of the Ashkum soil are used for parks, building site development, lawns, and gardens. This soil is poorly suited to dwellings, local roads and streets, and septic tank absorption fields. Because of the seasonal wetness, it is poorly suited to lawns and landscaping, vegetable and flower gardens, ornamental trees and shrubs, and recreational uses. Underground drains help to lower the water table, and surface drains help to overcome the wetness. Erosion is a hazard in areas where the surface is left bare and in areas used as watercourses. Establishing a vegetative cover helps to control erosion.

If the Ashkum soil is used as a site for dwellings, the ponding and the shrink-swell potential are management concerns. Underground drains help to lower the water table, and surface drains help to control the ponding. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

In most areas access to municipal sanitary facilities is available. In other areas, the ponding and the moderately slow permeability are management concerns if the Ashkum soil is used as a site for septic tank absorption fields. A drainage system is needed. Also, adding as much as 2 feet of loamy fill material increases the depth to the seasonal high water table. Enlarging the absorption area helps to overcome the moderate absorption of liquid waste.

Low strength, ponding, frost action, and shrinking and swelling are problems if the Ashkum soil is used as a site for local roads and streets. Providing suitable subgrade material helps to prevent the damage caused by low strength, frost action, and shrinking and swelling. Installing a drainage system and grading the roads so that they shed water help to prevent the damage caused by ponding and by frost action.

No land capability classification is assigned.

2242A—Kendall-Urban land complex, 0 to 3 percent slopes. This map unit occurs as nearly level areas of a somewhat poorly drained Kendall soil intermingled with areas of Urban land. It is on slight rises and low ridges on outwash plains. Individual areas range from 5 to more than 100 acres in size. They are 40 to 55 percent Kendall soil and 35 to 45 percent Urban land. The Kendall soil and the Urban land occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the Kendall soil has a surface layer of very dark gray, friable silt loam about 3 inches thick. The subsurface layer is dark grayish brown, mottled, friable silt loam about 4 inches thick. The subsoil is about 41 inches thick. It is brown and mottled. The upper part is friable silt loam; the next part is firm and friable silty clay loam; and the lower part is brown, friable, stratified silt loam, loam, and sandy loam. The underlying material to a depth of 60 inches or more is brown, mottled, friable, stratified silt loam, loam, and clay loam. In a few places the underlying material is firm, calcareous loam. Other small areas have been cut, built up, or smoothed.

The Urban land consists of streets, parking lots, buildings, and other structures.

Included in mapping are small areas of the well drained Camden and poorly drained Drummer soils. Camden soils are on side slopes and ridgetops above the Kendall soil. Drummer soils are in shallow depressions and drainageways below the Kendall soil. Included soils make up 15 to 25 percent of the unit.

Water and air move through the Kendall soil at a moderate rate. Surface runoff is slow. A seasonal high water table is 1 to 3 feet below the surface during the spring. Available water capacity is high. Organic matter content is moderately low. The shrink-swell potential is moderate, and the potential for frost action is high.

Areas of the Kendall soil are used for parks, building site development, lawns, and gardens. This soil is well suited to vegetable and flower gardens and ornamental trees and shrubs and is moderately well suited to lawns and landscaping and recreational uses. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

If the Kendall soil is used as a site for dwellings, the seasonal high water table and the shrink-swell potential are limitations. Installing underground drains around the foundations helps to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

In most areas access to municipal sanitary facilities is available. In other areas, the seasonal high water table and the moderate permeability are limitations if the Kendall soil is used as a site for septic tank absorption fields. Underground drains help to lower the water table. Enlarging the absorption field helps to overcome the moderate absorption of liquid waste.

Low strength and the potential for frost action are limitations if the Kendall soil is used as a site for local roads and streets. Providing suitable subgrade material helps to prevent the damage caused by low strength and by frost action. Installing a drainage system and grading the roads so that they shed water reduce wetness and help to prevent the damage caused by frost action.

No land capability classification is assigned.

2291B—Xenia-Urban land complex, 1 to 5 percent slopes. This map unit occurs as gently sloping areas of a moderately well drained Xenia soil intermingled with areas of Urban land. It is on side slopes and ridgetops on till plains. Individual areas range from 15 to 45 acres in size. They are 45 to 60 percent Xenia soil and 25 to 40 percent Urban land. The Xenia soil and the Urban land occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the Xenia soil has a surface layer of very dark gray, friable silt loam about 2 inches thick. The subsurface layer is brown, friable silt loam about 4 inches thick. The subsoil is about 43 inches thick. The upper part is yellowish brown, friable silt loam; the next part is dark yellowish brown, mottled, friable silty clay loam and clay loam; and the lower part is olive brown, friable clay loam. The underlying material to a depth of 60 inches or more is olive brown, mottled, firm loam. In some areas the upper part of the subsoil contains more sand. In other areas the lower part of the subsoil is not mottled and is stratified loam and sandy loam. Small areas have been cut, built up, or smoothed during construction.

The Urban land consists of streets, parking lots, buildings, and other structures.

Included in mapping are small areas of the poorly drained Drummer and somewhat poorly drained Sabina soils. Drummer soils are in shallow depressions and drainageways below the Xenia soil. Sabina soils are on slight rises below the Xenia soil. Included soils make up 15 to 25 percent of the unit.

Water and air move through the Xenia soil at a moderately slow rate. Surface runoff is medium. A seasonal high water table is 2 to 6 feet below the surface during the spring. Available water capacity is high. Organic matter content is moderately low. The shrink-swell potential is moderate, and the potential for frost action is high.

Areas of the Xenia soil are used for parks, building site development, lawns, and gardens. This soil is well suited to lawns, vegetable and flower gardens, and ornamental trees. The surface layer is friable and can easily be tilled throughout a wide range in moisture content. The soil is poorly suited to dwellings with basements and to septic tank absorption fields. It is moderately well suited to dwellings without basements and is poorly suited to local roads and streets. Erosion is a hazard in areas where the surface is left bare for considerable periods. Establishing a vegetative cover helps to control erosion.

If the Xenia soil is used as a site for dwellings, the seasonal high water table and the shrink-swell potential are limitations. Installing underground drains around the foundations helps to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

In most areas access to municipal sanitary facilities is available. In other areas, the seasonal high water table and the moderately slow permeability are limitations if the Xenia soil is used as a site for septic tank absorption fields. The septic system functions properly only if the water table is lowered or the distribution lines are installed closer to the surface than is typical. Enlarging the absorption area helps to overcome the moderately slow absorption of liquid waste.

Low strength and the potential for frost action are limitations if the Xenia soil is used as a site for local roads and streets. Providing suitable subgrade material helps to prevent the damage caused by low strength and by frost action. Installing a drainage system and grading the roads so that they shed water reduce wetness and help to prevent the damage caused by frost action.

No land capability classification is assigned.

2570B—Martinsville-Urban land complex, 1 to 5 percent slopes. This map unit occurs as gently sloping areas of a well drained Martinsville soil intermingled with areas of Urban land. It is on side slopes and ridgetops on outwash plains and stream terraces. Individual areas range from 15 to more than 60 acres in size. They are 45 to 60 percent Martinsville soil and 25 to 40 percent Urban land. The Martinsville soil and the Urban land occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the Martinsville soil has a surface layer of very dark brown, friable loam about 5 inches thick. The subsurface layer is dark yellowish brown, friable loam about 6 inches thick. The subsoil is about 36 inches thick. The upper part is dark yellowish brown, friable clay loam, and the lower part is dark yellowish brown, friable gravelly loam. The underlying material to a depth of 65 inches or more is dark yellowish brown, friable, stratified gravelly loam and clay loam. In places the surface layer is thicker. In some areas the underlying material is firm, calcareous loam. In other areas the upper part of the subsoil contains more silt and less sand. Small areas have been cut, built up, or smoothed during construction.

The Urban land consists of streets, parking lots, buildings, and other structures.

Included in mapping are small areas of the poorly drained Drummer and somewhat poorly drained Kendall soils. Drummer soils are in shallow depressions and drainageways below the Martinsville soil. Kendall soils are on slight rises below the Martinsville soil. Included soils make up 10 to 25 percent of the unit.

Water and air move through the Martinsville soil at a moderate rate. Surface runoff is medium. Available water capacity is high. Organic matter content is moderately low. The shrink-swell potential and the potential for frost action are moderate.

Areas of the Martinsville soil are used for parks, building site development, lawns, and gardens. This soil is well suited to lawns, vegetable and flower gardens, and ornamental trees and shrubs. The surface layer is friable and can easily be tilled throughout a wide range

Figure 12.—This park in Danville is in an area of Landes fine sandy loam, occasionally flooded.

in moisture content. The soil is well suited to dwellings with basements and to septic tank absorption fields. It is moderately well suited to dwellings without basements and to local roads and streets. Erosion is a hazard in areas where the surface is left bare for considerable periods. Establishing a vegetative cover helps to control erosion.

If the Martinsville soil is used as a site for dwellings without basements, the shrink-swell potential is a limitation. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

Shrinking and swelling and the potential for frost action are limitations if the Martinsville soil is used as a site for local roads and streets. Providing suitable subgrade material helps to prevent the damage caused by shrinking and swelling and by frost action. Grading roads so that they shed water reduces wetness and helps to prevent the damage caused by frost action.

No land capability classification is assigned.

7304A—Landes fine sandy loam, rarely flooded, 0 to 3 percent slopes. This gently sloping, well drained soil is on flood plains. It is subject to rare flooding for brief periods from January through June. Individual areas are long and narrow or irregularly shaped and range from 3 to more than 200 acres in size.

Typically, the surface soil is very dark grayish brown, friable fine sandy loam about 16 inches thick. The subsoil is about 19 inches thick. The upper part is brown, friable fine sandy loam, and the lower part is brown, friable loamy fine sand. The underlying material to a depth of 60 inches or more is brown and pale brown, very friable and loose loamy fine sand and sand. In some areas the soil contains less sand and more clay or silt. In other areas the underlying material is calcareous sand and gravel. In a few places the surface layer is lighter in color.

Included with this soil in mapping are small areas of the somewhat poorly drained Shaffton and poorly drained Sawmill soils. These soils are on flood plains below the Landes soil. Included soils make up 2 to 15 percent of the unit.

Water and air move through the upper part of the Landes soil at a moderately rapid rate and through the underlying material at a rapid rate. Surface runoff is slow in cultivated areas. Available water capacity is low.

Figure 13.—Prime farmland in an area of the Drummer-Flanagan association.

Organic matter content is moderate. The potential for frost action also is moderate.

Most areas are cultivated. This soil is well suited to woodland and to woodland wildlife habitat. It is moderately well suited to cultivated crops, to pasture and hay, and to local roads and streets. It is generally unsuited to dwellings and septic tank absorption fields because of the flooding.

In the areas used for corn, soybeans, or small grain, flooding normally does not interfere with crop growth during the growing season. Droughtiness and soil blowing are hazards. Keeping tillage at a minimum and returning crop residue to the soil help to control soil blowing, improve tilth, and conserve soil moisture.

Pasture and hay plants grow well on this soil. Overgrazing, however, reduces forage production. Proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition.

The land capability classification is IIs.

8304—Landes fine sandy loam, occasionally flooded. This nearly level, well drained soil is on flood plains. It is occasionally flooded for brief periods from January through June. Individual areas are long and narrow or irregularly shaped and range from 3 to 60 acres in size.

Typically, the surface layer is very dark gray, friable fine sandy loam about 6 inches thick. The subsurface layer is very dark grayish brown, friable fine sandy loam about 10 inches thick. The subsoil is about 21 inches thick. The upper part is dark brown, friable fine sandy loam, and the lower part is dark brown, friable loamy sand. The underlying material to a depth of 62 inches or more is brown and grayish brown, loose sand. In some areas the surface layer is lighter in color. In other areas the surface soil and the subsoil contain less sand and more silt or clay. In places the underlying material is calcareous sand and gravel.

Included with this soil in mapping are small areas of the somewhat poorly drained Shaffton and poorly drained Sawmill soils. These soils are on flood plains below the Landes soil. They make up 2 to 15 percent of the unit.

Water and air move through the upper part of the Landes soil at a moderately rapid rate and through the underlying material at a rapid rate. Surface runoff is slow in cultivated areas. Available water capacity is low. Organic matter content is moderate. The potential for frost action also is moderate.

Most areas are cultivated. This soil is well suited to woodland and to woodland wildlife habitat. It is moderately well suited to cultivated crops and to pasture and hay and is poorly suited to local roads and streets. It generally is unsuited to dwellings and septic tank absorption fields because of the flooding (fig. 12).

In the areas used for corn, soybeans, or small grain, flooding normally does not interfere with crop growth during the growing season. However, replanting may be necessary in some years. Droughtiness and soil blowing are hazards. Keeping tillage at a minimum and returning crop residue to the soil help to control soil blowing, improve tilth, and conserve soil moisture.

Pasture and hay plants grow well on this soil. Overgrazing, however, reduces forage production. Proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition. In the areas used for hay, the flooding delays harvesting in some years.

The land capability classification is IIw.

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 (fig. 13).

Prime farmland, as defined by the U.S. Department of Agriculture, is the land that is best suited to food, feed, forage, fiber, and oilseed crops. It may be cultivated land, pasture, woodland, or other land, but it is not urban or built-up land or water areas. It either is used for food or fiber crops or is available for those crops. The soil qualities, growing season, and moisture supply are those needed for a well managed soil to produce a sustained high yield of crops in an economic manner. Prime farmland produces the highest yields with minimal expenditure of energy and economic resources, and farming it results in the least damage to the environment.

Prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The level of acidity or alkalinity is acceptable. Prime farmland has few or no rocks and is permeable to water and air. It is not excessively erodible or saturated with water for long periods and is not frequently flooded during the growing season. The 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 the county has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

The map units in Vermilion County that are considered prime farmland are listed in table 5. This list does not constitute a recommendation for a particular land use. The extent of each listed map unit is shown in table 4. The location is shown on the detailed soil maps at the back of this publication. The soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."

Some soils that have a seasonal high water table and all soils that are frequently flooded during the growing season qualify as prime farmland only in areas where these limitations have been overcome by drainage measures or flood control. The need for these measures is indicated after the map unit name in table 5. Onsite evaluation is needed to determine whether or not these limitations have been overcome by corrective measures. In Vermilion County most of the naturally wet soils have been adequately drained.

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 woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

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

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

In 1986, about 456,000 acres in Vermilion County was cropland, 24,500 acres was pasture, and 33,500 acres was woodland. An additional 62,640 acres was made up of water areas, parks, roads, and other built-up areas.

The soils in Vermilion County have good potential for continued crop production, particularly if the latest crop production technology is applied to the cropland. This soil survey can greatly facilitate the application of such technology. It provides valuable information for land use planning. Land use planners can use this information when decisions are made regarding the orderly growth and development of urban and rural areas.

The major management needs in the county are measures that help to control erosion, maintain or improve tilth and fertility, remove excess water, and increase the rate of water infiltration. A cropping system that keeps a plant cover and crop residue on the surface for extended periods helps to control erosion and maintains the productive capacity of the soils. Including grasses and legumes in the cropping system helps to prevent surface crusting, improves tilth, and provides nitrogen for the following crop.

Erosion is the major management concern on about 20 percent of the cropland and pasture in Vermilion County. It is adequately controlled on about 50 percent of this land. Erosion is a hazard on some soils that have slopes of more than 2 percent. It is more severe on the longer slopes.

Loss of the surface layer, or sheet erosion, is damaging for several reasons. Productivity is reduced as the surface layer is eroded away and part of the subsoil is incorporated into the plow layer because erosion reduces the organic matter content and natural fertility level. Severe erosion on sloping soils results in deterioration of tilth in the surface soil and reduces the rate of water infiltration. The more clayey soils tend to be cloddy if they are worked when wet. Preparing a good seedbed is difficult on these soils. Also, these soils tend to crust after hard rains. As a result, the runoff rate is increased. Erosion can result in the sedimentation of streams, rivers, ponds, and ditches. Removing this sediment is expensive. Erosion control helps to prevent this pollution and improves the quality of water for municipal and recreational uses and for fish and wildlife.

Terraces, contour farming, conservation tillage, and diversions help to control erosion and reduce the runoff rate. These practices are most effective on soils that have uniform and regular slopes. In areas where the slopes are short and irregular, a crop rotation that provides an adequate plant cover is needed to control erosion.

A conservation tillage system, such as chisel plowing, no-till farming, or ridge planting, helps to prevent excessive soil loss, reduces the runoff rate, and increases the rate of water infiltration. Chisel plowing is suitable on most of the soils in the county. No-till farming is more successful on well drained or moderately well drained soils, such as Jasper and Symerton soils, than on poorly drained soils, such as Ashkum and Drummer soils, because the wet conditions delay planting and hinder seed germination. Ridge planting is suitable on most nearly level, tillable soils.

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 6. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of each map unit also is shown in the table.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents *(4)*. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

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

Crops other than those shown in table 6 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management *(7)*. 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 woodland or for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit. Only class and subclass are used in this survey.

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

Class I soils have few limitations that restrict their use.

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

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

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

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main 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 I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w, s,* or *c* because the soils in class V are subject to little or no erosion. They have other limitations that restrict their use to pasture, woodland, wildlife habitat, or recreation.

The acreage of soils in each capability class and subclass is shown in table 7. The capability classification of each map unit is given in the section "Detailed Soil Map Units" and in the yields table.

Woodland Management and Productivity

Most of the woodland in Vermilion County is near the rivers and streams. The trees have been cleared from most of the land suitable for cultivating. Most of the remaining woodland is in areas that are too steep or too wet for cultivation. The soils in these areas have fair or good potential for producing high-quality trees if the woodland is properly managed.

About 33,500 acres, or 6 percent of the acreage in the county, is woodland. The largest areas of woodland are in associations 10, 11, and 13, which are described under the heading "General Soil Map Units." Common species are shagbark hickory, white oak, red oak, American beech, white ash, sugar maple, cottonwood, sycamore, and black walnut.

Many of the stands can be improved by measures that thin out mature trees and remove undesirable species. Measures that prevent fires, keep livestock from grazing in wooded areas, and control diseases and insects also are needed.

Table 8 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol,* a number, indicates the potential productivity of the soils for an indicator tree species. The number indicates the volume, in cubic meters per hectare per year, which the indicator species can produce. The number 1 indicates low potential productivity; 2 and 3, moderate; 4 and 5, moderately high; 6 to 8, high; 9 to 11, very high; and 12 to 39, extremely high. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *R* indicates steep slopes; *X,* stoniness or rockiness; *W,* excess water in or on the soil; *T,* toxic substances in the soil; *D,* restricted rooting depth; *C,* clay in the upper part of the soil; *S,* sandy texture; *F,* high content of rock fragments in the soil; and *N,* snowpack. The letter *A* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: R, X, W, T, D, C, S, F, and N.

In table 8, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Erosion hazard is the probability that damage will occur as a result of site preparation and cutting where the soil is exposed along roads, skid trails, and fire lanes and in log-handling areas. Forests that have been burned or overgrazed are also subject to erosion. Ratings of the erosion hazard are based on the percent of the slope. A rating of *slight* indicates that no particular prevention measures are needed under ordinary conditions. A rating of *moderate* indicates that erosion-control measures are needed in certain silvicultural activities. A rating of *severe* indicates that special precautions are needed to control erosion in most silvicultural activities.

Equipment limitation reflects the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. The chief characteristics and conditions considered in the ratings are slope, stones on the surface, rock outcrops, soil wetness, and texture of the surface layer. A rating of *slight* indicates that under normal conditions the kind of equipment and season of use are not significantly restricted by soil factors. Soil wetness can restrict equipment use, but the wet period does not exceed 1 month. A rating of *moderate* indicates that equipment use is moderately restricted because of one or more soil factors. If the soil is wet, the wetness restricts equipment use for a period of 1 to 3 months. A rating of *severe* indicates that equipment use is severely restricted either as to the kind of equipment that can be used or the season of use. If the soil is wet, the wetness restricts equipment use for more than 3 months.

Seedling mortality refers to the death of naturally occurring or planted tree seedlings, as influenced by the kinds of soil, soil wetness, or topographic conditions. The factors used in rating the soils for seedling mortality are texture of the surface layer, depth to a seasonal high water table and the length of the period when the water table is high, rock fragments in the surface layer, effective rooting depth, and slope aspect. A rating of *slight* indicates that seedling mortality is not likely to be a problem under normal conditions. Expected mortality is less than 25 percent. A rating of *moderate* indicates that some problems from seedling mortality can be expected. Extra precautions are advisable. Expected mortality is 25 to 50 percent. A rating of *severe* indicates that seedling mortality is a serious problem. Extra precautions are important. Replanting may be necessary. Expected mortality is more than 50 percent.

Windthrow hazard is the likelihood that trees will be uprooted by the wind because the soil is not deep enough to give adequate root anchorage. The main restrictions that affect rooting are a seasonal high water table and the depth to bedrock, a fragipan, or other limiting layers. A rating of *slight* indicates that under normal conditions no trees are blown down by the wind. Strong winds may damage trees, but they do not uproot them. A rating of *moderate* indicates that some trees can be blown down during periods when the soil is wet and winds are moderate or strong. A rating of *severe* indicates that many trees can be blown down during these periods.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index* and as a *productivity class*. 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 woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

The *productivity class*, a number, is the yield likely to be produced by the most important trees. This number, expressed as cubic meters per hectare per year, indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

The first species listed under *common trees* for a soil is the indicator species for that soil. It generally is the most common species on the soil and is the one that determines the ordination class.

Trees to plant are those that are suitable for commercial wood production.

Windbreaks and Environmental Plantings

Windbreaks protect livestock, buildings, and yards from wind and snow. They also protect fruit trees and gardens, and they furnish habitat for wildlife. Several rows of low- and high-growing broadleaf and coniferous trees and shrubs provide the most protection.

Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil. Field windbreaks protect cropland and crops from wind, help to keep snow on the fields, and provide food and cover for wildlife.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To ensure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Table 9 shows the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates in table 9 are based on measurements and observation of established plantings that have been given adequate care. They can be used as a guide in planning windbreaks and screens. Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from local offices of the Natural Resources Conservation Service or the Cooperative Extension Service or from a commercial nursery.

Recreation

About 1 percent of the acreage in Vermilion County is developed for recreational purposes. Recreational facilities in the county include golf courses, playgrounds, athletic fields, swimming pools, and camping and picnic areas. Other outdoor activities available are boating, hiking, canoeing, hunting, and fishing (fig. 14).

The soils of the survey area are rated in table 10 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In

Figure 14.—A recreational area at Kickapoo State Park, in an area of the Lenzburg-Water association.

planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 10, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 10 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 13 and interpretations for dwellings without basements and for local roads and streets in table 12.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or

Figure 15.—A picnic area in Kennekuk Cove on Blount silt loam, 2 to 5 percent slopes, eroded.

stones or boulders that increase the cost of shaping sites or of building access roads and parking areas (fig. 15).

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

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 11, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

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

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, and oats.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, lovegrass, 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 are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, wheatgrass, and grama.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are Russian-olive, autumn-olive, and crabapple.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, wildrice, saltgrass, cordgrass, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include bobwhite quail, pheasant, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, ruffed grouse, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, and deer.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

The kind and abundance of wildlife in Vermilion County reflect the soil types, land use, and vegetation. Many of the soils originally had a seasonal high water table within a depth of 1 foot. Although some areas were wooded, especially areas along rivers, the native plant communities were dominated by tall prairie grasses. Because the native plant communities were influenced by the seasonal high water table, they included many wet prairie or marsh plants.

Wildlife that were formerly abundant include waterfowl, shore birds, muskrats, mink, raccoons, prairie chickens, upland sandpipers, and grassland birds and mammals. The transition areas between prairie and woodland provided habitat for cottontail rabbit, bobwhite quail, cardinals, brown thrashers, and many other species. Less conspicuous, but a very important part of the natural fauna, were the reptiles and amphibians of the wet prairie.

After the county was settled, drainage systems, intensive cultivation, and urbanization altered the wildlife communities. These changes tended to favor the more adaptable species and those more tolerant of human settlements, such as horned larks, cardinals, mourning doves, raccoons, and white-tailed deer.

The soil associations in Vermilion County, which are described under the heading "General Soil Map Units," can be grouped into four wildlife areas. These wildlife areas are described in the following paragraphs.

Wildlife Area 1 includes the Drummer-Flanagan, Raub-Drummer-Dana, Sable-Ipava, Drummer-Brenton-Milford, Milford-Lisbon, Ashkum-Elliott-Andres, Elliott-Ashkum-Varna, Bryce-Swygert, and Clarence-Rowe associations. It does not include areas where a significant part of the acreage is urban land. The soils are nearly level to moderately sloping and range from poorly drained to moderately well drained. They are upland soils that have a dark surface layer.

This area is mainly cropland. A few small areas along field borders and minor streams are pastured or wooded. Meadows and pasture provide habitat for openland wildlife. The wildlife common in this area include cottontail rabbits, red fox, pheasant, and many types of songbirds.

Good pasture management measures, such as excluding livestock from wooded areas, a system of conservation tillage that leaves crop residue on the surface after planting, and deferment of mowing in grassy areas until August, improve this wildlife area. Seeding roadsides, fence rows, and travel lanes to perennial plants, such as smooth bromegrass, alfalfa, and alsike clover, or allowing the perennial native prairie grasses, such as bluestem, switchgrass, and cordgrass, to dominate helps to control undesirable weeds and provides good cover for wildlife.

Wildlife Area 2 includes the Fincastle-Sabina-Strawn, Blount-Morley-Ashkum, and Sawmill-Landes-Shaffton associations. It does not include areas where a significant part of the acreage is urban land. The soils are nearly level to very steep and range from poorly drained to well drained. Soils in the Sawmill-Landes-Shaffton association are subject to flooding. This wildlife area is mainly on forested uplands and areas of bottom land along the major streams. Some of the acreage is good cropland, open meadows, or wetland. The wildlife population is more diversified than that in wildlife area 1. It includes a variety of wetland, woodland, and openland wildlife species. Examples are deer, squirrels, raccoons, pheasant, rabbits, muskrats, frogs, snakes, and many types of birds.

Native trees, shrubs, and prairie plants provide the best cover if measures that exclude livestock from the area are applied. Establishing hedgerows, farm windbreaks, and strips of grass or grass-legume mixtures improves the area.

Wildlife Area 3 includes areas where much of the acreage is urban land. The soils are nearly level to gently sloping and range from poorly drained to well drained.

Although much of this area has been developed for urban uses, some of the acreage is used for parks or is idle land. The wildlife species are mainly those that can adapt to urban conditions. Examples are gray squirrel, fox squirrel, mice, cardinals, song sparrows, robins, pigeons, and bluejays. The few open areas attract pheasant, quail, rabbits, and songbirds.

Planting food-bearing ornamental trees and shrubs provides habitat diversity and cover valuable to wildlife, especially to songbirds. Examples of plants suitable for landscaping are oak, maple, cherry, silky dogwood, flowering dogwood, crabapple, Amur honeysuckle, viburnum, pyracantha, elderberry, and sumac.

Wildlife Area 4 includes the Lenzburg-Water association. This association consists of strip-mined areas and water areas on strip-mined land. Lenzburg soils are well drained and formed in loamy material deposited after strip-mining operations. They are nearly level to very steep and are moderately slowly permeable. This area is mainly used for housing development, recreation, or wildlife habitat. It provides good habitat for openland, wetland, and woodland wildlife. Examples include deer, raccoons, rabbits, mice, herons, ducks, frogs, snakes, and many types of songbirds. Locust, cedar, and cottonwood trees suitable for planting include black walnut, green ash, white ash, and eastern cottonwood. Hardy grass varieties have been planted in some areas to control erosion.

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 estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

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

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

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

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

Building Site Development

Table 12 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and depth to the water table.

Dwellings and *small commercial buildings* are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrinking and swelling, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, slope, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or stabilized soil material; and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost action potential, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a cemented pan, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 13 shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 13 also shows the suitability of the soils for use as daily cover for landfill. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 13 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage resulting from rapid permeability in the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground-water pollution. Ease of excavation and revegetation should be considered.

The ratings in table 13 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

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 final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 14 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help to determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, a low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have a moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet and have a water table at a depth of less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In table 14, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil),

Figure 16.—An aluminum toe-wall spillway structure stabilizes the end of a grassed waterway in an area of Saybrook silt loam, 2 to 5 percent slopes, eroded.

the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable, loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal high water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 15 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas and for embankments, dikes, and levees. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In 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.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and the potential for frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, or sulfur. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or to a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of soil blowing or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity (fig. 16). Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of soil blowing, low available water capacity, restricted rooting depth, toxic substances such as salts or sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

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

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics. These results are reported in table 19.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classification, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 16 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

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

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as about 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the "Glossary."

Classification of the soils is determined according to the Unified soil classification system *(2)* and the system adopted by the American Association of State Highway and Transportation Officials *(1)*.

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

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

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in table 19.

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

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

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

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

Physical and Chemical Properties

Table 17 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and 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 ⅓-bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The classes are *low*, a change of less than 3 percent;

moderate, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

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) 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 (up to 4 percent) and on soil structure and permeability. Values of K range from 0.05 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

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 resistance to soil blowing in cultivated areas. The groups indicate the susceptibility to soil blowing. Soils are grouped according to the following distinctions:

1. Coarse sands, sands, fine sands, and very fine sands. These soils are generally not suitable for crops. They are extremely erodible, and vegetation is difficult to establish.

2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, and sapric soil material. These soils are very highly erodible. Crops can be grown if intensive measures to control soil blowing are used.

3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams. These soils are highly erodible. Crops can be grown if intensive measures to control soil blowing are used.

4L. Calcareous loams, silt loams, clay loams, and silty clay loams. These soils are erodible. Crops can be grown if intensive measures to control soil blowing are used.

4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay. These soils are moderately erodible. Crops can be grown if measures to control soil blowing are used.

5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material. These soils are slightly erodible. Crops can be grown if measures to control soil blowing are used.

6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay. These soils are very slightly erodible. Crops can be grown if ordinary measures to control soil blowing are used.

7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material. These soils are very slightly erodible. Crops can be grown if ordinary measures to control soil blowing are used.

8. Soils that are not subject to soil blowing because of coarse fragments on the surface or because of surface wetness.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 17, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 18 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the infiltration of water when the soils 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 permanent 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 two hydrologic groups in table

18, the first letter is for drained areas and the second is for undrained areas.

Flooding, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, nor is water in swamps and marshes.

Table 18 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is nearly 0 percent 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); and *frequent* that it occurs often under normal weather conditions (the chance of flooding is more than 50 percent in any year). Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 days to 1 month, and *very long* if more than 1 month. Probable dates are expressed in months. About two-thirds to three-fourths of all flooding occurs during the stated period.

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.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 18 are depth to the seasonal high water table; the kind of water table—that is, perched or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 18.

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.

Only saturated zones within a depth of about 6 feet are indicated. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. The first numeral in the range indicates how high the water rises above the surface. The second numeral indicates the depth below the surface.

Potential 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 mainly to pavements and other rigid structures.

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

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

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

Engineering Index Test Data

Table 19 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 Their Morphology." The soil samples were tested by the Illinois Department of Transportation.

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 AASHTO classification—M 145 (AASHTO), D 3282 (ASTM); Unified classification—D 2487 (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); and Moisture density—T 99 (AASHTO), D 698 (ASTM).

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(8)*. 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 20 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Eleven 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 Mollisol.

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 Aquoll (*Aqu*, meaning water, plus *oll*, from Mollisol).

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

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

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

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

Soil Series and Their Morphology

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

Characteristics of the soil and the material in which it formed are identified for each series. The soil is compared with similar soils and with nearby soils of other series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" *(9)*. Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" *(8)*. Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

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

Alvin Series

The Alvin series consists of well drained, moderately permeable soils on outwash plains and stream terraces. These soils formed in loamy and sandy material. Slope ranges from 1 to 5 percent.

Alvin soils are similar to Onarga soils and commonly are adjacent to Shaffton and Whitaker soils. The somewhat poorly drained Shaffton and Whitaker soils are lower on the landscape than the Alvin soils. Shaffton soils are subject to frequent flooding. Onarga soils have a mollic epipedon.

Typical pedon of Alvin fine sandy loam, 1 to 5 percent slopes, 2,320 feet south and 1,760 feet east of the northwest corner of sec. 32, T. 21 N., R. 11 W.

Ap—0 to 8 inches; dark brown (10YR 4/3) fine sandy loam, light brownish gray (10YR 6/2) dry; weak fine granular structure; very friable; medium acid; abrupt smooth boundary.

BE—8 to 11 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak fine subangular blocky structure; very friable; few distinct grayish brown (10YR 5/2) silt coatings on faces of peds; medium acid; clear smooth boundary.

Bt1—11 to 15 inches; dark yellowish brown (10YR 4/4) fine sandy loam; moderate fine subangular blocky structure; friable; few faint dark brown (10YR 4/3) clay films on faces of peds; medium acid; clear smooth boundary.

Bt2—15 to 25 inches; dark yellowish brown (10YR 4/4) fine sandy loam; moderate medium subangular blocky structure; friable; common faint dark brown (10YR 4/3) clay films on faces of peds; strongly acid; clear smooth boundary.

E&Bt—25 to 60 inches; yellowish brown (10YR 4/6) loamy fine sand (E); weak medium subangular blocky structure; very friable; dark yellowish brown (10YR 4/6) fine sandy loam (Bt); moderate medium subangular blocky structure; friable; common distinct dark brown (10YR 4/3) clay films on faces of peds; strongly acid.

The thickness of the solum ranges from 40 to 60 inches. The surface layer is 6 to 10 inches thick.

The A horizon has value of 3 or 4 and chroma of 2 or 3. It is fine sandy loam or sandy loam. The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. It is fine sandy loam, sandy loam, or loam.

Ambraw Series

The Ambraw series consists of poorly drained, moderately permeable or moderately slowly permeable soils on flood plains. These soils formed in loamy alluvium. Slope ranges from 0 to 2 percent.

Ambraw soils are similar to Sawmill and Selma soils and commonly are adjacent to Elliott and Shaffton soils. The somewhat poorly drained Elliott soils are on till plains and moraines above the Ambraw soils. Sawmill soils formed in silty alluvium and have a thicker mollic epipedon than the Ambraw soils. Selma soils are on outwash plains. The somewhat poorly drained Shaffton soils are higher on the flood plains than the Ambraw soils.

Typical pedon of Ambraw loam, 200 feet east and 1,700 feet north of the southwest corner of sec. 21, T. 21 N., R. 11 W.

Ap—0 to 7 inches; black (10YR 2/1) loam, dark gray (10YR 4/1) dry; moderate very fine granular structure; friable; slightly acid; abrupt smooth boundary.

A—7 to 16 inches; black (10YR 2/1) loam, dark gray (10YR 4/1) dry; few fine distinct light olive brown (2.5Y 5/4) mottles in the lower 3 inches; weak fine subangular blocky structure parting to weak fine granular; friable; slightly acid; clear smooth boundary.

Bg1—16 to 21 inches; dark grayish brown (2.5Y 4/2) clay loam; common fine faint light olive brown (2.5Y 5/4) and few fine prominent yellowish brown (10YR 5/6) mottles; moderate fine subangular blocky structure; friable; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few fine rounded concretions of iron and manganese oxides; slightly acid; clear smooth boundary.

Bg2—21 to 33 inches; grayish brown (2.5Y 5/2) clay loam; many fine faint light olive brown (2.5Y 5/4) and common fine prominent yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; friable; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; common fine rounded concretions of iron and manganese oxides; 5 percent fine gravel; slightly acid; gradual smooth boundary.

Bg3—33 to 46 inches; gray (10YR 5/1) loam; common distinct light olive brown (2.5Y 5/4) and common fine prominent yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; friable; few distinct very dark grayish brown (10YR 3/2) organic coatings lining pores; common fine rounded concretions of iron and manganese oxides; 5 percent fine gravel; neutral; gradual smooth boundary.

BCg—46 to 55 inches; gray (10YR 5/1), stratified loam, clay loam, and sandy loam; common medium prominent light olive brown (2.5Y 5/4) and few fine prominent yellowish brown (10YR 5/6) mottles; weak coarse subangular blocky structure; friable; few fine rounded concretions of iron and manganese oxides; 5 percent fine gravel; neutral; gradual smooth boundary.

Cg—55 to 60 inches; gray (10YR 6/1), stratified loam, clay loam, and sandy loam; many medium prominent light olive brown (2.5Y 5/4) and few fine prominent yellowish brown (10YR 5/6) mottles; massive; friable; 5 percent fine gravel; neutral.

The thickness of the solum ranges from 44 to 59 inches. The mollic epipedon is 14 to 24 inches in thickness.

The A horizon has value of 2 or 3 and chroma of 1 or 2. The Bg horizon has hue of 10YR or 2.5Y or is neutral in hue. It has value of 4 to 6 and chroma of 0 to 2. The BCg horizon, if it occurs, is clay loam or sandy loam. It commonly contains strata of loam, sandy loam, or loamy sand. The Cg horizon is dominantly clay loam and contains strata that vary in texture.

Andres Series

The Andres series consists of somewhat poorly drained, moderately slowly permeable soils on uplands. These soils formed in loamy outwash and in the underlying silty till. Slope ranges from 0 to 2 percent.

Andres soils are similar to La Hogue, Mokena, and Odell soils and commonly are adjacent to Ashkum, Elliott, and Symerton soils. The poorly drained Ashkum soils are lower on the landscape than the Andres soils. Elliott soils formed in silty material and in the underlying silty till. La Hogue soils formed entirely in loamy outwash. Mokena soils formed in silty material and loamy outwash and in the underlying clayey till. Odell soils formed entirely in loamy till. The moderately well drained Symerton soils are higher on the landscape than the Andres soils.

Typical pedon of Andres loam, 1,500 feet north and 100 feet east of the southwest corner of sec. 2, T. 23 N., R. 13 W.

Ap—0 to 8 inches; very dark gray (10YR 3/1) loam, gray (10YR 5/1) dry; moderate very fine granular structure; friable; medium acid; abrupt smooth boundary.

A—8 to 12 inches; very dark gray (10YR 3/1) loam, gray (10YR 5/1) dry; weak fine subangular blocky structure parting to moderate fine granular; friable; medium acid; clear smooth boundary.

BA—12 to 17 inches; dark brown (10YR 4/3) clay loam; moderate very fine subangular blocky structure; friable; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; slightly acid; clear smooth boundary.

Bt1—17 to 26 inches; dark yellowish brown (10YR 4/4) clay loam; few fine distinct yellowish brown (10YR 5/6) and common fine distinct dark grayish brown (10YR 4/2) mottles; moderate fine subangular blocky structure; friable; few distinct very dark gray (10YR 3/1) organic coatings and many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; 2 percent fine gravel; slightly acid; gradual smooth boundary.

Bt2—26 to 36 inches; dark yellowish brown (10YR 4/4) clay loam; common fine distinct yellowish brown (10YR 5/6) and many fine distinct dark grayish brown (10YR 4/2) mottles; moderate medium subangular blocky structure; friable; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; 2 percent fine gravel; neutral; gradual smooth boundary.

Bt3—36 to 44 inches; yellowish brown (10YR 5/4) clay loam; many fine distinct grayish brown (10YR 5/2) and common fine faint yellowish brown (10YR 5/4) mottles; moderate medium subangular blocky structure; friable; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; 2 percent fine gravel; neutral; clear smooth boundary.

2BC—44 to 50 inches; olive brown (2.5Y 4/4) silty clay loam; many medium prominent gray (5Y 6/1) and common fine distinct yellowish brown (10YR 5/6) mottles; weak coarse subangular blocky structure; firm; 5 percent fine gravel; slight effervescence; mildly alkaline; gradual smooth boundary.

2C—50 to 60 inches; olive brown (2.5Y 4/4) silty clay loam; many coarse prominent gray (5Y 6/1) and common medium distinct yellowish brown (10YR 5/6) mottles; massive; very firm; 5 percent fine gravel; few medium rounded concretions of calcium carbonate; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 36 to 55 inches. The mollic epipedon is 10 to 18 inches in thickness.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. It is silt loam or loam. The Bt horizon has hue of 10YR or 2.5Y and chroma of 2 to 4. The 2C horizon is silty clay loam or silt loam and has more than 24 percent clay.

Ashkum Series

The Ashkum series consists of poorly drained, moderately slowly permeable soils on till plains and moraines. These soils formed in silty sediments and in the underlying silty till. Slope ranges from 0 to 2 percent.

Ashkum soils are similar to Bryce and Milford soils and commonly are adjacent to Elliott and Varna soils. Bryce soils formed in clayey sediments and in the underlying clayey till. The somewhat poorly drained Elliott soils are higher on the landscape than the Ashkum soils. Milford soils formed entirely in silty and loamy sediments. The moderately well drained Varna soils are higher on the landscape than the Ashkum soils.

Typical pedon of Ashkum silty clay loam, 1,500 feet west and 350 feet south of the northeast corner of sec. 33, T. 21 N., R. 13 W.

Ap—0 to 9 inches; black (10YR 2/1) silty clay loam, dark grayish brown (10YR 4/2) dry; moderate very fine granular structure; friable; slightly acid; abrupt smooth boundary.

A—9 to 18 inches; black (10YR 2/1) silty clay loam, dark grayish brown (10YR 4/2) dry; moderate very fine subangular blocky structure; friable; slightly acid; abrupt smooth boundary.

BA—18 to 22 inches; dark gray (2.5Y 4/1) silty clay loam; moderate very fine subangular blocky structure; friable; many distinct black (10YR 2/1) organic coatings on faces of peds; few fine rounded concretions of iron and manganese oxides; neutral; clear smooth boundary.

Bg1—22 to 31 inches; gray (2.5Y 5/1) silty clay loam; common fine prominent yellowish brown (10YR 5/6) mottles; moderate fine subangular blocky structure; firm; common distinct very dark gray (10YR 3/1) organic coatings and few faint dark gray (2.5Y 4/1) clay films on faces of peds; 5 percent fine gravel; few fine rounded concretions of iron and manganese oxides; neutral; gradual smooth boundary.

2Bg2—31 to 42 inches; gray (2.5Y 5/1) silty clay loam; common fine prominent yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; few distinct very dark gray (10YR 3/1) organic coatings and few faint dark gray (2.5Y 4/1) clay films on faces of peds; 5 percent fine gravel; common fine rounded concretions of iron and manganese oxides; neutral; gradual smooth boundary.

2BCg—42 to 52 inches; light gray (N 6/0) silty clay loam; many medium prominent yellowish brown (10YR 5/6) and common medium distinct light olive brown (2.5Y 5/4) mottles; weak coarse subangular blocky structure; firm; 5 percent fine gravel; common fine rounded concretions of iron and manganese oxides; neutral; diffuse smooth boundary.

2Cg—52 to 60 inches; light gray (N 6/0) silty clay loam; many medium prominent yellowish brown (10YR 5/6) and common medium prominent light olive brown (2.5Y 5/4) mottles; massive; firm; 5 percent fine gravel; few fine rounded concretions of iron and manganese oxides; slight effervescence; mildly alkaline.

The thickness of the solum ranges from 38 to 55 inches. The thickness of the overlying silty material ranges from 20 to 40 inches. The mollic epipedon is 12 to 24 inches in thickness.

The A horizon has hue of 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 or 1. It is silty clay loam or silty clay. The 2Bg horizon has hue of 5Y, 2.5Y, or 10YR or is neutral in hue. It has value of 3 to 5 and chroma of 0 to 2. It is silty clay loam or silty clay. The content of clay ranges from 35 to 42 percent in the control section. The 2C horizon has hue of 2.5Y or 5Y or is neutral in hue. It has value of 4 to 6 and chroma of 0 to 4.

Birkbeck Series

The Birkbeck series consists of moderately well drained, moderately slowly permeable soils on till plains. These soils formed in loess and in the underlying loamy till. Slope ranges from 1 to 5 percent.

Birkbeck soils are similar to Camden soils and commonly are adjacent to Sabina and Strawn soils. The well drained Camden soils formed in loess and in the underlying outwash. The somewhat poorly drained Sabina soils are lower on the landscape than the Birkbeck soils. The well drained Strawn soils formed entirely in loamy till.

Typical pedon of Birkbeck silt loam, 1 to 5 percent slopes, 800 feet east and 1,100 feet south of the northwest corner of sec. 30, T. 19 N., R. 12 W.

Ap—0 to 5 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine granular structure; friable; slightly acid; abrupt smooth boundary.

E—5 to 10 inches; brown (10YR 5/3) silt loam, very pale brown (10YR 7/3) dry; weak medium platy structure; friable; common faint pale brown (10YR 4/4) silt loam; moderate very fine subangular blocky structure; friable; common distinct light brownish gray (10YR 6/2) silt coatings on faces of peds; strongly acid; clear smooth boundary.

Bt1—10 to 21 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine subangular blocky structure; friable; many faint dark yellowish brown (10YR 4/4) clay films on faces of peds; very strongly acid; gradual smooth boundary.

Bt2—21 to 33 inches; yellowish brown (10YR 5/4) silty clay loam; few fine distinct strong brown (7.5YR 5/6) and few fine faint brown (10YR 5/3) mottles; moderate medium subangular blocky structure; friable; few distinct light brownish gray (10YR 6/2) silica coatings on faces of peds; common faint dark yellowish brown (10YR 4/4) clay films on faces of peds; common fine irregular accumulations of iron and manganese oxides; very strongly acid; gradual smooth boundary.

Bt3—33 to 46 inches; yellowish brown (10YR 5/4) silty clay loam; common fine distinct strong brown (7.5YR 5/6) and common fine distinct grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure; friable; few distinct light brownish gray (10YR 6/2) silica coatings on faces of peds; common faint dark yellowish brown (10YR 4/4) clay films on faces of peds; common fine irregular accumulations of iron and manganese oxides; strongly acid; clear smooth boundary.

2Bt4—46 to 55 inches; olive brown (2.5Y 4/4) clay loam; common medium distinct grayish brown (2.5Y 5/2) and common fine distinct yellowish brown (10YR 5/6) mottles; weak coarse subangular blocky structure; friable; few distinct dark grayish brown (10YR 4/2) and brown (10YR 4/3) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxides; 5 percent gravel; neutral; gradual smooth boundary.

2C—55 to 60 inches; olive brown (2.5Y 4/4) loam; few fine distinct grayish brown (2.5Y 5/2) and few fine distinct yellowish brown (10YR 5/6) mottles; massive; firm; few fine rounded accumulations of iron and manganese oxides; 5 percent gravel; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 44 to 70 inches. The thickness of the loess ranges from 40 to 60 inches. The surface soil is 5 to 13 inches in thickness.

The A horizon has value of 3 or 4 and chroma of 1 to 3. The Bt horizon has value of 4 or 5 and chroma of 3 to 6. The 2C horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 4. It is loam or clay loam.

Blount Series

The Blount series consists of somewhat poorly drained, slowly permeable or moderately slowly permeable soils on till plains and moraines. These soils formed in silty till or in silty material and in the underlying silty till. Slope ranges from 0 to 5 percent.

Blount soils are similar to Keomah and Sabina soils and commonly are adjacent to Ashkum and Morley soils. The poorly drained Ashkum soils are lower on the landscape than the Blount soils. They have a mollic epipedon and do not have an argillic horizon. Keomah soils formed entirely in loess. The well drained and moderately well drained Morley soils are on the more sloping parts of the landscape. Sabina soils formed in loess and in the underlying loamy till.

Typical pedon of Blount silt loam, 0 to 2 percent slopes, 1,000 feet north and 1,200 feet west of the southeast corner of sec. 15, T. 20 N., R. 12 W.

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

E—6 to 11 inches; grayish brown (10YR 5/2) silt loam, light gray (10YR 7/2) dry; few fine faint brown (10YR 5/3) mottles; moderate very fine subangular blocky structure; friable; few fine rounded concretions of iron and manganese oxides; strongly acid; clear smooth boundary.

2Bt1—11 to 19 inches; brown (10YR 4/3) silty clay; common fine distinct yellowish brown (10YR 5/6) and few fine faint dark grayish brown (10YR 4/2) mottles; moderate very fine subangular blocky structure; firm; many faint dark grayish brown (10YR 4/2) clay films on faces of peds; few fine rounded concretions of iron and manganese oxides; 3 percent fine and medium gravel; very strongly acid; gradual smooth boundary.

2Bt2—19 to 29 inches; brown (10YR 4/3) silty clay loam; common medium distinct yellowish brown (10YR 5/6) and common fine faint dark grayish brown (10YR 4/2) mottles; moderate fine subangular blocky structure; firm; many faint dark grayish brown (10YR 4/2) clay films on faces of peds; few medium irregular accumulations of iron and manganese oxides; 3 percent fine and medium gravel; very strongly acid; gradual smooth boundary.

2Bt3—29 to 34 inches; light olive brown (2.5Y 5/4) silty clay loam; many medium distinct gray (2.5Y 6/1) and common medium prominent yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; common distinct gray (10YR 5/1) clay films on faces of peds; few distinct very dark gray (10YR 3/1) organic coatings lining pores; common medium irregular accumulations of iron and manganese oxides; 3 percent fine and medium gravel; slightly acid; clear smooth boundary.

2BC—34 to 40 inches; light olive brown (2.5Y 5/4) silty clay loam; common medium distinct prominent gray (2.5Y 6/1) and common medium prominent yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; firm; few distinct gray (10YR 5/1) clay films on faces of peds; few distinct very dark gray (10YR 3/1) organic coatings lining pores; few medium irregular accumulations of iron and manganese oxides; 3 percent fine and medium gravel; slight effervescence; mildly alkaline; clear smooth boundary.

2C—40 to 60 inches; grayish brown (2.5Y 5/2) silty clay loam; few medium distinct gray (2.5Y 6/1) and few fine prominent light olive brown (2.5Y 5/6) mottles; massive; very firm; common faint light brownish gray (2.5Y 6/2) coatings on faces of cleavage planes; common fine irregular concretions of calcium carbonate; 5 percent fine and medium gravel; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 26 to 50 inches. The depth to free carbonates ranges from 22 to 40 inches. The surface layer is 4 to 8 inches in thickness.

The A horizon has chroma of 1 or 2. It is dominantly silt loam, but in some pedons it is loam. The 2Bt horizon has value of 4 to 6 and chroma of 1 to 4. The content of clay ranges from 35 to 48 percent in the control section. The 2BC horizon has chroma of 1 to 4. It is silty clay loam. The 2C horizon has chroma of 1 to 4.

Brenton Series

The Brenton series consists of somewhat poorly drained, moderately permeable soils on outwash plains and stream terraces. These soils formed in loess or silty material and in the underlying outwash. Slope ranges from 0 to 2 percent.

Brenton soils are similar to Elburn, Lisbon, and Raub soils and commonly are adjacent to Drummer and Proctor soils. The poorly drained Drummer soils are lower on the landscape than the Brenton soils. They do not have an argillic horizon. Elburn soils formed in a thicker layer of loess than the Brenton soils. Lisbon soils formed in loess or silty material and in the underlying silty or loamy till. They have a thinner solum than the Brenton soils. The well drained and moderately well drained Proctor soils are higher on the landscape than the Brenton soils. Raub soils formed in loess and in the underlying loamy till.

Typical pedon of Brenton silt loam, 900 feet east and 120 feet north of the southwest corner of sec. 35, T. 20 N., R. 13 W.

Ap—0 to 9 inches; very dark gray (10YR 3/1) silt loam, grayish brown (10YR 5/2) dry; moderate very fine granular structure; friable; neutral; abrupt smooth boundary.

A—9 to 12 inches; very dark gray (10YR 3/1) silt loam, grayish brown (10YR 5/2) dry; moderate very fine subangular blocky structure; friable; slightly acid; clear smooth boundary.

BA—12 to 16 inches; dark brown (10YR 4/3) silty clay loam; few fine faint dark grayish brown (10YR 4/2) mottles; moderate fine subangular blocky structure; friable; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds; medium acid; clear smooth boundary.

Bt1—16 to 27 inches; dark yellowish brown (10YR 4/4) silty clay loam; common fine faint dark grayish brown (10YR 4/2) and common fine distinct yellowish brown (10YR 5/6) mottles; moderate fine subangular blocky structure; friable; many distinct dark brown (10YR 4/3) clay films and common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; medium acid; clear smooth boundary.

2Bt2—27 to 35 inches; dark yellowish brown (10YR 4/4), stratified clay loam and loam; common fine distinct dark grayish brown (10YR 4/2) and common fine distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; friable; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few faint very dark gray (10YR 3/1) organic coatings lining pores; 5 percent fine gravel; medium acid; gradual smooth boundary.

2BC—35 to 48 inches; dark yellowish brown (10YR 4/4), stratified loam and sandy loam; common fine distinct dark grayish brown (10YR 4/2) and common fine distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; very friable; few faint very dark gray (10YR 3/1) organic coatings lining pores; 5 percent fine gravel; neutral; gradual smooth boundary.

2C—48 to 60 inches; dark yellowish brown (10YR 4/4), stratified loam, sandy loam, and loamy sand; common fine distinct dark grayish brown (10YR 4/2) and many fine distinct yellowish brown (10YR 5/6) mottles; massive; very friable; 5 percent fine gravel; slight effervescence; neutral.

The thickness of the solum ranges from 38 to 50 inches. The thickness of the overlying silty material ranges from 25 to 40 inches. The mollic epipedon is 10 to 18 inches in thickness.

The A horizon has value of 2 or 3 and chroma of 1 or 2. The Bt horizon has value of 4 or 5 and chroma of 2 to 4. The content of clay ranges from 27 to 35 percent in the control section. The 2B horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 1 to 4. It is loam, sandy loam, or clay loam. The 2C horizon is stratified silt loam, loam, clay loam, sandy loam, or loamy sand.

Bryce Series

The Bryce series consists of poorly drained, very slowly permeable soils on till plains and moraines. These soils formed in clayey sediments and in the underlying clayey till. Slope ranges from 0 to 2 percent.

Bryce soils are similar to Ashkum, Milford, and Rowe soils and commonly are adjacent to Mona and Swygert soils. Ashkum soils formed in silty sediments and in the underlying silty till. Milford soils formed entirely in silty and loamy sediments. Mona and Rowe soils have an argillic horizon. The moderately well drained Mona soils are higher on the landscape than the Bryce soils, and Rowe soils have more clay in the solum. The somewhat poorly drained Swygert soils are higher on the landscape than the Bryce soils.

Typical pedon of Bryce silty clay, 800 feet south and 823 west of the northeast corner of sec. 3, T. 22 N., R. 14 W.

Ap—0 to 8 inches; black (10YR 2/1) silty clay, dark gray (10YR 4/1) dry; weak fine granular structure; friable; medium acid; clear smooth boundary.

A—8 to 16 inches; black (10YR 2/1) silty clay, dark gray (10YR 4/1) dry; weak fine subangular blocky structure parting to moderate medium granular; friable; slightly acid; clear smooth boundary.

Btg1—16 to 24 inches; dark grayish brown (2.5Y 4/2) silty clay; few fine faint grayish brown (10YR 5/2) and few fine distinct yellowish brown (10YR 5/6) mottles; moderate fine subangular blocky structure; firm; few distinct black (10YR 2/1) and few distinct dark gray (10YR 4/1) clay films on faces of peds; slightly acid; clear smooth boundary.

Btg2—24 to 36 inches; olive gray (5Y 5/2) silty clay; few fine faint dark gray (5Y 4/1) and common medium prominent yellowish brown (10YR 5/8) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few distinct very dark gray (10YR 3/1) and few distinct olive gray (5Y 4/2) clay films on faces of peds; neutral; clear smooth boundary.

Btg3—36 to 44 inches; gray (5Y 5/1) silty clay; common medium prominent yellowish brown (10YR 5/8) mottles; weak coarse prismatic structure parting to weak coarse subangular blocky; very firm; few faint dark gray (5Y 4/1) clay films on faces of peds; few fine black (N 2/0) concretions of iron and manganese oxides; neutral; clear smooth boundary.

2BCg—44 to 55 inches; gray (5Y 5/1) silty clay; common medium prominent yellowish brown (10YR 5/8) mottles; weak coarse prismatic structure; very firm; common medium white (10YR 8/1) concretions of calcium carbonate; few fine black (N 2/0) concretions of iron and manganese oxides; few shale pebbles; slight effervescence; mildly alkaline; clear smooth boundary.

2Cg—55 to 60 inches; gray (5Y 5/1) silty clay; many medium prominent yellowish brown (10YR 5/8) mottles; massive; very firm; common medium white (10YR 8/1) concretions of calcium carbonate; few fine black (N 2/0) concretions of iron and manganese oxides; few shale pebbles; slight effervescence; mildly alkaline.

The thickness of the solum ranges from 38 to 58 inches. The mollic epipedon is 10 to 22 inches in thickness.

The A horizon has hue of 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 or 1. It is silty clay or silty clay loam. The Btg horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 or 5, and chroma of 1 or 2. It is silty clay or clay. The content of clay ranges from 42 to 50 percent in the control section. The Cg horizon has hue of 2.5Y or 5Y, value of 4 or 5, and chroma of 1 or 2.

Camden Series

The Camden series consists of well drained, moderately permeable soils on outwash plains and stream terraces. These soils formed in loess and in the underlying outwash. Slope ranges from 1 to 5 percent.

Camden soils are similar to Birkbeck and Xenia soils and commonly are adjacent to Drummer and Kendall soils. The moderately well drained Birkbeck soils formed in loess and in the underlying loamy till. Drummer and Kendall soils are lower on the landscape than the Camden soils. The poorly drained Drummer soils have a mollic epipedon and do not have an argillic horizon. Kendall soils are somewhat poorly drained. The moderately well drained Xenia soils formed in loess and in the underlying loamy till.

Typical pedon of Camden silt loam, 1 to 5 percent slopes, 700 feet west and 250 feet north of the southeast corner of sec. 9, T. 19 N., R. 13 W.

Ap—0 to 4 inches; brown (10YR 4/3) silt loam, light brownish gray (10YR 6/2) dry; moderate very fine granular structure; friable; medium acid; abrupt smooth boundary.

E—4 to 10 inches; dark brown (10YR 4/3) silt loam, light yellowish brown (10YR 6/4) dry; moderate very fine subangular blocky structure; friable; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; very strongly acid; clear smooth boundary.

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

Bt1—14 to 22 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium subangular blocky structure; friable; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; common distinct dark brown (10YR 4/3) clay films on faces of peds; medium acid; clear smooth boundary.

Bt2—22 to 28 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; friable; common distinct dark brown (10YR 4/3) clay films on faces of peds; medium acid; clear smooth boundary.

2Bt3—28 to 38 inches; yellowish brown (10YR 5/6) clay loam; moderate medium subangular blocky structure; friable; common distinct dark brown (10YR 4/3) clay films on faces of peds; 2 percent fine gravel; medium acid; clear smooth boundary.

2BC—38 to 50 inches; yellowish brown (10YR 5/6) sandy clay loam; weak coarse prismatic structure; friable; few distinct dark brown (10YR 4/3) clay films on faces of peds; 3 percent medium gravel; medium acid; clear smooth boundary.

2C—50 to 60 inches; yellowish brown (10YR 5/6 and 5/4) sandy loam that has strata of sand and loamy sand; single grain; very friable; 2 percent fine gravel; medium acid.

The thickness of the solum ranges from 40 to 57 inches. The thickness of the loess ranges from 24 to 38 inches.

The A horizon has value of 4 or 5 and chroma of 2 or 3. The Bt horizon has value of 4 or 5. It is silt loam or silty clay loam. The 2Bt horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6. It is clay loam, sandy loam, loam, or sandy clay loam. The 2C horizon is generally sandy loam or loam, but it may contain strata of other textures.

Catlin Series

The Catlin series consists of moderately well drained, moderately permeable soils on till plains and moraines. These soils formed in loess and in the underlying loamy till. Slope ranges from 2 to 5 percent.

Catlin soils are similar to Dana, Plano, Proctor, and Saybrook soils and commonly are adjacent to Drummer and Flanagan soils. Dana soils formed in a thinner layer of loess than the Catlin soils and in the underlying loamy till. The poorly drained Drummer soils are lower on the landscape than the Catlin soils. They do not have an argillic horizon. The somewhat poorly drained Flanagan soils are lower on the landscape than the Catlin soils. The well drained Plano soils formed in loess and in the underlying outwash. The well drained and moderately well drained Proctor soils formed in a thinner layer of loess than the Catlin soils and in the underlying outwash. Saybrook soils formed in a thinner layer of loess than the Catlin soils and in the underlying silty or loamy till. Also, they have a thinner solum.

Typical pedon of Catlin silt loam, 2 to 5 percent slopes, 2,500 feet east and 2,600 feet south of the northwest corner of sec. 25, T. 18 N., R. 12 W.

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

A—9 to 15 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; medium acid; clear smooth boundary.

BA—15 to 20 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate very fine subangular blocky structure; friable; many distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; medium acid; clear smooth boundary.

Bt1—20 to 30 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine subangular blocky structure; friable; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; common faint dark brown (10YR 4/3) clay films on faces of peds; strongly acid; gradual smooth boundary.

Bt2—30 to 41 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium subangular blocky structure; friable; common faint dark brown (10YR 4/3) clay films on faces of peds; strongly acid; gradual smooth boundary.

Bt3—41 to 53 inches; dark yellowish brown (10YR 4/4) silty clay loam; few fine distinct strong brown (7.5YR 4/4) silty clay loam; few fine distinct strong brown (7.5YR 5/6) and few fine faint brown (10YR 5/3) mottles; moderate medium subangular blocky structure; friable; few faint dark brown (10YR 4/3) clay films on faces of peds; medium acid; clear smooth boundary.

BC—53 to 59 inches; olive brown (2.5Y 4/4) clay loam; few fine prominent yellowish brown (10YR 5/6) and few fine distinct gray (2.5Y 5/1) mottles; weak medium subangular blocky structure; firm; 5 percent fine gravel; slightly acid; gradual smooth boundary.

2C—59 to 74 inches; olive brown (2.5Y 4/4) loam; few fine distinct yellowish brown (10YR 5/6) and few fine distinct gray (2.5Y 5/1) mottles; massive; firm; 5 percent fine gravel and 2 percent medium gravel; slight effervescence; mildly alkaline.

The thickness of the solum ranges from 45 to 65 inches. The thickness of the loess ranges from 40 to 60 inches. The mollic epipedon is 10 to 18 inches in thickness.

The A horizon has value of 2 or 3 and chroma of 1 to 3. The Bt horizon has value of 4 or 5 and chroma of 3 or 4. It is silt loam or silty clay loam. The 2C horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 to 6.

Chatsworth Series

The Chatsworth series consists of moderately well drained, very slowly permeable soils on till plains and moraines. These soils formed in clayey till. Slope ranges from 5 to 10 percent.

Chatsworth soils commonly are adjacent to Bryce, Clarence, Rowe, and Swygert soils. These adjacent soils are lower on the landscape than the Chatsworth soils. They have a mollic epipedon and have a thicker solum than the Chatsworth soils. Bryce and Rowe soils are poorly drained. Clarence and Swygert soils are somewhat poorly drained. Clarence, Rowe, and Swygert soils have an argillic horizon.

Typical pedon of Chatsworth silty clay, 5 to 10 percent slopes, 2,200 feet west and 40 feet south of the northeast corner of sec. 26, T. 23 N., R. 14 W.

Ap—0 to 5 inches; dark grayish brown (2.5Y 4/2) silty clay, light brownish gray (2.5Y 6/2) dry; moderate medium granular structure; firm; slightly acid; abrupt smooth boundary.

Bw—5 to 10 inches; olive gray (5Y 4/2) silty clay; few fine faint dark gray (5Y 4/1) and few fine distinct olive brown (2.5Y 4/4) mottles; moderate fine subangular blocky structure; firm; few faint gray (5Y 5/1) organic coatings on faces of peds; slight effervescence; mildly alkaline; clear wavy boundary.

BC—10 to 16 inches; olive gray (5Y 5/2) silty clay; common fine distinct light olive brown (2.5Y 5/4) mottles; weak medium prismatic structure parting to moderate fine subangular blocky; very firm; few faint dark gray (5Y 4/1) organic coatings on faces of peds; strong effervescence; mildly alkaline; gradual wavy boundary.

C1—16 to 21 inches; gray (5Y 5/1) silty clay; common medium distinct light olive brown (2.5Y 5/4) mottles; weak medium prismatic structure; very firm; few faint dark gray (5Y 4/1) coatings along cleavage planes; few medium white (5Y 8/1) accumulations of calcium carbonate; 2 percent fine gravel; violent effervescence; moderately alkaline; gradual wavy boundary.

C2—21 to 36 inches; gray (5Y 5/1) silty clay; many medium distinct light olive brown (2.5Y 5/4) mottles; massive; very firm; common faint dark gray (5Y 4/1) coatings along cleavage planes; common medium white (5Y 8/1) accumulations of calcium carbonate; 3 percent fine gravel; violent effervescence; moderately alkaline; gradual wavy boundary.

C3—36 to 60 inches; gray (5Y 5/1) silty clay; many medium prominent light olive brown (2.5Y 5/6) mottles; massive; very firm; many faint dark gray (5Y 4/1) coatings along cleavage planes; common medium white (5Y 8/1) accumulations of calcium carbonate; 5 percent fine gravel; violent effervescence; moderately alkaline.

The thickness of the solum ranges from 10 to 24 inches. The depth to free carbonates ranges from 0 to 12 inches. The surface layer is 2 to 8 inches thick.

The A horizon has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 1 or 2. It is silty clay, silty clay loam, or silt loam. The C horizon is silty clay, clay, or silty clay loam.

Clarence Series

The Clarence series consists of somewhat poorly drained, very slowly permeable soils on till plains and moraines. These soils formed in clayey till. Slope ranges from 0 to 6 percent.

Clarence soils are similar to Swygert soils and are commonly adjacent to Mona and Rowe soils. The moderately well drained Mona soils are higher on the landscape than the Clarence soils. The poorly drained Rowe soils are lower on the landscape than the Clarence soils. Swygert soils formed in silty material and in the underlying clayey till. Mona and Swygert soils contain less clay in the solum than the Clarence soils.

Typical pedon of Clarence silty clay loam, 0 to 2 percent slopes, 400 feet north and 100 feet east of the southwest corner of sec. 2, T. 23 N., R. 14 W.

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) silty clay loam, gray (10YR 5/1) dry; moderate fine granular structure; friable; many faint very dark gray (10YR 3/1) organic coatings on faces of peds; common fine and few medium roots; slightly acid; abrupt smooth boundary.

A—7 to 12 inches; very dark grayish brown (10YR 3/2) silty clay loam, grayish brown (10YR 5/2) dry; moderate medium granular structure; friable; many faint very dark gray (10YR 3/1) organic coatings on faces of peds; common fine roots; neutral; clear smooth boundary.

Bt1—12 to 18 inches; dark grayish brown (2.5Y 4/2) silty clay; few fine prominent yellowish brown (10YR 5/6) mottles; weak fine subangular blocky structure; firm; few fine roots; few distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few distinct very dark gray (10YR 3/1) organic coatings on faces of peds; neutral; clear smooth boundary.

Bt2—18 to 25 inches; dark grayish brown (2.5Y 4/2) silty clay; few fine faint light olive brown (2.5Y 5/4) and few fine prominent yellowish brown (10YR 5/6) mottles; moderate medium angular blocky structure; firm; few fine roots; common distinct dark gray (10YR 4/1) clay films on faces of peds; few distinct very dark gray (10YR 3/1) organic coatings on faces of peds; mildly alkaline; clear smooth boundary.

Bt3—25 to 34 inches; grayish brown (2.5Y 5/2) silty clay; few fine faint light olive brown (2.5Y 5/4) and common fine prominent yellowish brown (10YR 5/6) mottles; moderate medium angular blocky structure; firm; few fine roots; common distinct dark gray (10YR 4/1) clay films on faces of peds; few distinct very dark gray (10YR 3/1) organic coatings on faces of peds; mildly alkaline; clear smooth boundary.

BC—34 to 38 inches; grayish brown (2.5Y 5/2) silty clay; common medium faint light olive brown (2.5Y 5/4) and common medium prominent yellowish brown (10YR 5/6) mottles; weak medium prismatic structure; very firm; few roots; few distinct dark gray (10YR 4/1) clay films on faces of peds; few distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few fine black (N 2/0) concretions of iron and manganese oxides; few fine white (10YR 8/1) concretions of calcium carbonate; 1 percent fine gravel; slight effervescence; mildly alkaline; clear smooth boundary.

C—38 to 60 inches; mottled light olive brown (2.5Y 5/4) and gray (5Y 5/1) silty clay; massive; very firm; very few distinct dark gray (10YR 4/1) coatings on coarse vertical cleavage planes; common fine white (10YR 8/1) concretions of calcium carbonate; few fine black (N 2/0) concretions of iron and manganese oxides; few fine strong brown (7.5YR 5/6) iron accumulations; 1 percent fine gravel; violent effervescence; moderately alkaline.

The thickness of the solum ranges from 26 to 39 inches. The depth to carbonates ranges from 16 to 38 inches. The surface soil is 7 to 16 inches in thickness.

The A horizon has value of 2 or 3 and chroma of 1 or 2. It is silty clay loam or silty clay. The Bt horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 to 4. It is silty clay or clay. The content of clay ranges from 50 to 55 percent in the control section. The C horizon has chroma of 1 to 4. It is silty clay or clay.

Clarence silty clay, 2 to 6 percent slopes, eroded, has a thinner dark surface layer than is defined as the range for the series. Also, it has carbonates closer to the surface. These differences, however, do not significantly affect the use or behavior of the soil. This soil is classified as fine, illitic, mesic Aquollic Hapludalfs.

Corwin Series

The Corwin series consists of moderately well drained, moderately slowly permeable soils on till plains and moraines. These soils formed in loamy till. Slope ranges from 2 to 5 percent.

The Corwin soils in this county have a thinner dark surface layer than is defined as the range for the series. This difference, however, does not significantly affect the use or behavior of the soils. These soils are classified as fine-loamy, mixed, mesic Mollic Hapludalfs.

Corwin soils are similar to Mona, Parr, and Symerton soils and commonly are adjacent to Drummer, Lisbon, and Odell soils. The poorly drained Drummer soils are lower on the landscape than the Corwin soils. They do not have an argillic horizon. The somewhat poorly drained Lisbon and Odell soils are lower on the landscape than the Corwin soils. Mona soils formed in silty material and loamy outwash and in the underlying clayey till. The well drained Parr soils are on the more sloping parts of the landscape. Symerton soils formed in loamy outwash and in the underlying silty till.

Typical pedon of Corwin silt loam, 2 to 5 percent slopes, eroded, 100 feet east and 2,700 feet south of the northwest corner of sec. 1, T. 23 N., R. 11 W.

Ap—0 to 8 inches; very dark gray (10YR 3/1) silt loam, grayish brown (10YR 5/2) dry; mixed with common brown (10YR 4/3) fragments of subsoil material; weak very fine granular structure; friable; 3 percent fine and medium gravel; neutral; abrupt smooth boundary.

Bt1—8 to 16 inches; brown (10YR 4/3) clay loam; moderate very fine subangular blocky structure; friable; many faint very dark grayish brown (10YR 3/2) clay films on faces of peds; 3 percent fine and medium gravel; slightly acid; clear smooth boundary.

Bt2—16 to 28 inches; brown (10YR 4/3) clay loam; moderate fine subangular blocky structure; friable; many faint very dark grayish brown (10YR 3/2) clay films on faces of peds; 5 percent fine and medium gravel; slightly acid; gradual smooth boundary.

Bt3—28 to 34 inches; olive brown (2.5Y 4/4) clay loam; few fine faint grayish brown (2.5Y 5/2) mottles; moderate medium subangular blocky structure; friable; common faint very dark grayish brown (10YR 3/2) clay films on faces of peds; 10 percent fine and medium gravel; neutral; gradual smooth boundary.

C—34 to 60 inches; olive brown (2.5Y 5/3) loam; common coarse prominent reddish brown (5Y 5/4) and common medium distinct grayish brown (2.5Y

5/2) mottles; massive; firm; few faint very dark grayish brown (10YR 3/2) organic coatings lining pores; common medium irregular concretions of calcium carbonate; 10 percent fine and medium gravel; violent effervescence; moderately alkaline.

The thickness of the solum ranges from 24 to 40 inches. The surface layer is 7 to 10 inches thick.

The A horizon has value of 2 or 3 and chroma of 1 to 3. It is silt loam or loam. The Bt horizon has value of 4 or 5 and chroma of 3 to 6. It is clay loam or loam. The C horizon has hue of 10YR or 2.5Y.

Dana Series

The Dana series consists of moderately well drained, moderately slowly permeable soils on till plains and moraines. These soils formed in loess and in the underlying loamy till. Slope ranges from 2 to 5 percent.

The Dana soils in this county have a thinner dark surface layer than is defined as the range for the series. This difference, however, does not significantly affect the use or behavior of the soils. These soils are classified as fine-silty, mixed, mesic Mollic Hapludalfs.

Dana soils are similar to Catlin, Plano, Proctor, and Saybrook soils and commonly are adjacent to Drummer and Raub soils. Catlin soils formed in a thicker layer of loess than the Dana soils and in the underlying loamy till. The poorly drained Drummer soils are lower on the landscape than the Dana soils. The well drained Plano soils formed in a thicker layer of loess than the Dana soils and in the underlying outwash. The moderately well drained and well drained Proctor soils formed in loess and in the underlying outwash. The somewhat poorly drained Raub soils are lower on the landscape than the Dana soils. Saybrook soils have a thinner solum than the Dana soils.

Typical pedon of Dana silt loam, 2 to 5 percent slopes, eroded, 100 feet west and 200 feet north of the southeast corner of sec. 5, T. 18 N., R. 13 W.

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; mixed with common dark yellowish brown (10YR 4/4) fragments of subsoil material; moderate fine granular structure; friable; slightly acid; abrupt smooth boundary.

Bt1—7 to 17 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine subangular blocky structure; friable; common faint dark brown (10YR 4/3) clay films on faces of peds; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; medium acid; clear smooth boundary.

Bt2—17 to 29 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium subangular blocky structure; friable; many faint dark brown (10YR 4/3) clay films on faces of peds; medium acid; clear smooth boundary.

Bt3—29 to 39 inches; dark yellowish brown (10YR 4/4) clay loam; few fine distinct yellowish brown (10YR 5/6) and common fine distinct grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure; friable; common faint dark brown (10YR 4/3) clay films on faces of peds; 3 percent gravel; slightly acid; gradual smooth boundary.

2BC—39 to 47 inches; olive brown (2.5Y 4/4) loam; common fine distinct grayish brown (2.5Y 5/2) and few fine distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; few distinct very dark grayish brown (10YR 3/2) organic coatings lining pores; 3 percent gravel; neutral; gradual smooth boundary.

2C—47 to 60 inches; olive brown (2.5Y 4/4) loam; common fine distinct grayish brown (2.5Y 5/2) and few fine distinct yellowish brown (10YR 5/6) mottles; massive; firm; 3 percent gravel; slight effervescence; mildly alkaline.

The thickness of the solum ranges from 36 to 58 inches. The thickness of the loess ranges from 22 to 36 inches. The surface layer is 5 to 10 inches in thickness.

The A horizon has value of 2 or 3 and chroma of 1 or 2. The Bt horizon has value of 4 or 5 and chroma of 3 or 4. The 2C horizon has hue of 10YR or 2.5Y.

Drummer Series

The Drummer series consists of poorly drained, moderately permeable soils on uplands. These soils formed in loess or silty material and in the underlying outwash. Slope ranges from 0 to 2 percent.

Drummer soils are similar to Pella, Sable, and Selma soils and commonly are adjacent to Brenton and Flanagan soils. The somewhat poorly drained Brenton and Flanagan soils are higher on the landscape than the Drummer soils. Pella soils have carbonates within a depth of 40 inches. Sable soils formed entirely in loess. Selma soils formed entirely in loamy outwash.

Typical pedon of Drummer silty clay loam, 1,200 feet west and 2,300 feet north of the southeast corner of sec. 10, T. 19 N., R. 13 W.

Ap—0 to 8 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate very fine granular structure; friable; neutral; abrupt smooth boundary.

A—8 to 13 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine angular blocky structure parting to weak fine granular; friable; neutral; abrupt smooth boundary.

Bg1—13 to 22 inches; dark gray (10YR 4/1) silty clay loam; many medium distinct dark grayish brown (2.5Y 4/2) mottles; moderate very fine subangular blocky structure; friable; many faint very dark gray (10YR 3/1) organic coatings on faces of peds; few fine rounded concretions of iron and manganese oxides; neutral; clear smooth boundary.

Bg2—22 to 31 inches; gray (2.5Y 5/1) silty clay loam; common fine distinct light olive brown (2.5Y 5/4) and few fine prominent yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure parting to weak medium prismatic; friable; common distinct dark gray (10YR 4/1) organic coatings on faces of peds; common distinct very dark gray (10YR 3/1) organic coatings along pores; common fine rounded concretions of iron and manganese oxides; neutral; clear smooth boundary.

Bg3—31 to 47 inches; gray (2.5Y 5/1) silty clay loam; many coarse prominent yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; friable; common distinct very dark gray (10YR 3/1) and dark gray (10YR 4/1) organic coatings along pores; few fine rounded concretions of iron and manganese oxides; neutral; clear smooth boundary.

2BCg—47 to 54 inches; gray (2.5Y 5/1), stratified loam, clay loam, and silt loam; common medium prominent yellowish brown (10YR 5/6) mottles; weak coarse subangular blocky structure; friable; few distinct very dark gray (10YR 3/1) and dark gray (10YR 4/1) organic coatings along pores; 5 percent fine gravel; very slight effervescence; neutral; gradual smooth boundary.

2Cg—54 to 60 inches; light gray (2.5Y 6/1), stratified loam, silt loam, and clay loam; common medium prominent yellowish brown (10YR 5/6) mottles; massive; friable; 5 percent fine gravel; slight effervescence; mildly alkaline.

The thickness of the solum ranges from 45 to 60 inches. The thickness of the overlying silty material ranges from 40 to 60 inches. The mollic epipedon is 12 to 23 inches in thickness.

The A horizon has value of 2 or 3 and chroma of 1 or 2. The Bg horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, and chroma of 1 or 2. The 2BCg and 2Cg horizons are stratified loam, sandy loam, clay loam, silt loam, or silty clay loam.

Elburn Series

The Elburn series consists of somewhat poorly drained, moderately permeable soils on uplands. These soils formed in loess and in the underlying outwash. Slope ranges from 0 to 2 percent.

Elburn soils are similar to Brenton, Lisbon, and Raub soils and commonly are adjacent to Drummer, Plano, and Proctor soils. Brenton soils formed in a thinner layer of loess than the Elburn soils and in the underlying outwash. The poorly drained Drummer soils are lower on the landscape than the Elburn soils. Lisbon and Raub soils formed in loess or silty material and in the underlying silty or loamy till. Lisbon soils have a thinner solum than the Elburn soils. The well drained Plano soils are higher on the landscape than the Elburn soils. The well drained and moderately well drained Proctor soils are higher on the landscape than the Elburn soils.

Typical pedon of Elburn silt loam, 2,800 feet east and 80 feet north of the southwest corner of sec. 34, T. 19 N., R. 12 W.

Ap—0 to 9 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; moderate very fine granular structure; friable; slightly acid; abrupt smooth boundary.

A—9 to 16 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; weak medium subangular blocky structure parting to moderate fine granular; friable; medium acid; clear smooth boundary.

BA—16 to 21 inches; dark yellowish brown (10YR 4/4) silty clay loam; common fine distinct grayish brown (10YR 5/2) mottles; moderate very fine subangular blocky structure; friable; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds; medium acid; clear smooth boundary.

Bt1—21 to 31 inches; yellowish brown (10YR 5/4) silty clay loam; common fine distinct yellowish brown (10YR 5/6) and common fine distinct grayish brown (10YR 5/2) mottles; moderate fine subangular blocky structure; friable; few distinct very dark gray (10YR 3/1) organic coatings and many faint dark brown (10YR 4/3) clay films on faces of peds; slightly acid; gradual smooth boundary.

Bt2—31 to 39 inches; yellowish brown (10YR 5/4) silty clay loam; many fine distinct yellowish brown (10YR 5/6) and many fine distinct grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure; friable; few distinct very dark gray (10YR 3/1) organic coatings along pores; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; neutral; gradual smooth boundary.

Bt3—39 to 53 inches; yellowish brown (10YR 5/4) silty clay loam; many medium distinct yellowish brown (10YR 5/6) and many medium distinct grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure; friable; few distinct dark grayish brown (10YR 4/2) clay films on faces of peds; neutral; clear smooth boundary.

2BC—53 to 60 inches; yellowish brown (10YR 5/4), stratified silt loam, clay loam, and loam; common fine faint yellowish brown (10YR 5/6) and common fine distinct grayish brown (10YR 5/2) mottles; weak medium subangular blocky structure; friable; 10 percent fine gravel; neutral.

The thickness of the solum ranges from 47 to more than 60 inches. The thickness of the loess ranges from 45 to 60 inches. The mollic epipedon is 12 to 18 inches in thickness.

The A horizon has value of 2 or 3 and chroma of 1 or 2. The Bt horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 to 4. The 2BC horizon is stratified loam, sandy loam, clay loam, and silt loam.

Elliott Series

The Elliott series consists of somewhat poorly drained, slowly or moderately slowly permeable soils on till plains and moraines. These soils formed in silty till or in silty material and in the underlying silty till. Slope ranges from 0 to 6 percent.

Elliott soils are similar to Swygert soils and commonly are adjacent to Ashkum and Varna soils. The poorly drained Ashkum soils are lower on the landscape than the Elliott soils. Swygert soils formed in silty material and in the underlying clayey till. The moderately well drained Varna soils are higher on the landscape than the Elliott soils.

Typical pedon of Elliott silt loam, 0 to 2 percent slopes, 900 feet east and 200 feet south of the northwest corner of sec. 30, T. 21 N., R. 13 W.

Ap—0 to 7 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; weak very fine granular structure; friable; slightly acid; abrupt smooth boundary.

A—7 to 12 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; moderate fine granular structure; friable; slightly acid; clear smooth boundary.

BA—12 to 16 inches; olive brown (2.5Y 4/3) silty clay loam; few fine faint dark grayish brown (2.5Y 4/2) mottles; moderate very fine subangular blocky structure; friable; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few fine rounded concretions of iron and manganese oxides; neutral; clear smooth boundary.

Bt1—16 to 24 inches; olive brown (2.5Y 4/4) silty clay; common fine distinct yellowish brown (10YR 5/6) and grayish brown (2.5Y 5/2) mottles; moderate very fine subangular blocky structure; friable; many distinct dark grayish brown (2.5Y 4/2) clay films and common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few fine rounded concretions of iron and manganese oxides; 5 percent fine gravel; neutral; gradual smooth boundary.

2Bt2—24 to 34 inches; light olive brown (2.5Y 5/4) silty clay loam; many fine distinct grayish brown (2.5Y 5/1) and common fine prominent yellowish brown (10YR 5/6) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; friable; many distinct dark grayish brown (2.5Y 4/1) clay films on faces of peds; few distinct very dark grayish brown (10YR 3/2) organic coatings in pores; common fine rounded concretions of iron and manganese oxides; 5 percent fine gravel; neutral; gradual smooth boundary.

2BC—34 to 40 inches; light olive brown (2.5Y 5/4) silty clay loam; many medium distinct grayish brown (2.5Y 5/1) and many fine prominent yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; common distinct grayish brown (2.5Y 5/1) clay films on faces of peds; few fine rounded concretions of iron and manganese oxides; 5 percent fine gravel; slight effervescence; mildly alkaline; gradual smooth boundary.

2C—40 to 60 inches; light olive brown (2.5Y 5/4) silty clay loam; many medium prominent gray (N 6/0) mottles; massive; firm; few fine irregular concretions of calcium carbonate; 5 percent fine gravel; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 25 to 45 inches. The surface soil is 8 to 16 inches in thickness.

The A horizon has value of 2 or 3 and chroma of 1 or 2. It is silt loam or silty clay loam. The 2Bt horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 4. It is silty clay loam or silty clay. The content of clay ranges from 35 to 45 percent in the control section. The 2C horizon is silty clay loam or silt loam.

Elliott silty clay loam, 2 to 6 percent slopes, eroded, has a thinner dark surface layer than is defined as the range for the series. This difference, however, does not significantly affect the use or behavior of the soil. This soil is classified as fine, illitic, mesic Aquollic Hapludalfs.

Fincastle Series

The Fincastle series consists of somewhat poorly drained, moderately slowly permeable soils on till plains and moraines. These soils formed in loess and in the underlying loamy till. Slope ranges from 0 to 6 percent.

Fincastle soils are similar to Kendall and Starks soils and commonly are adjacent to Drummer, Miami, and Xenia soils. The poorly drained Drummer soils are lower on the landscape than the Fincastle soils. They have a mollic epipedon. Kendall and Starks soils formed in loess and in the underlying outwash. The well drained Miami soils are on the more sloping parts of the landscape. The moderately well drained Xenia soils are higher on the landscape than the Fincastle soils.

Typical pedon of Fincastle silt loam, 0 to 2 percent slopes, 2,460 feet north and 1,200 feet west of the southeast corner of sec. 4, T. 18 N., R. 11 W.

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

BE—10 to 14 inches; dark brown (10YR 4/3) silt loam; common fine faint grayish brown (10YR 5/2) and common fine distinct yellowish brown (10YR 5/6) mottles; moderate very fine subangular blocky structure; friable; few faint grayish brown (10YR 5/2) silt coatings on faces of peds; few fine irregular accumulations of iron and manganese oxides; strongly acid; clear smooth boundary.

Bt1—14 to 24 inches; dark yellowish brown (10YR 4/4) silty clay loam; common fine distinct grayish brown (10YR 5/2) and common fine distinct yellowish brown (10YR 5/6) mottles; moderate fine subangular blocky structure; friable; many distinct grayish brown (10YR 5/2) and dark grayish brown (10YR 4/2) clay films on faces of peds; few fine irregular accumulations of iron and manganese oxides; strongly acid; gradual smooth boundary.

Bt2—24 to 35 inches; dark yellowish brown (10YR 4/4) silty clay loam; many medium distinct grayish brown (10YR 5/2) and many fine distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; friable; many distinct grayish brown (10YR 5/2) and dark grayish brown (10YR 4/2) clay films on faces of peds; common fine irregular accumulations of iron and manganese oxides; strongly acid; clear smooth boundary.

2Bt3—35 to 43 inches; olive brown (2.5Y 4/4) clay loam; common fine distinct light olive brown (2.5Y 5/6) and common fine distinct grayish brown (2.5Y 5/2) mottles; moderate medium subangular blocky structure; friable; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; 5 percent fine and medium gravel; medium acid; gradual smooth boundary.

2BC—43 to 49 inches; olive brown (2.5Y 4/4) clay loam; common fine distinct light olive brown (2.5Y 5/6) and grayish brown (2.5Y 5/2) mottles; weak medium subangular blocky structure; friable; common distinct very dark grayish brown (10YR 3/2) organic coatings lining pores; 5 percent fine and medium gravel; very slight effervescence; mildly alkaline; gradual smooth boundary.

2C—49 to 60 inches; light olive brown (2.5Y 5/4) loam; common fine distinct grayish brown (2.5Y 5/2) and few fine faint light olive brown (2.5Y 5/6) mottles; massive; firm; 5 percent fine and medium gravel; slight effervescence; mildly alkaline.

The thickness of the solum ranges from 40 to 55 inches. The thickness of the loess ranges from 25 to 38 inches. The surface soil is 5 to 12 inches in thickness.

The Ap horizon has value of 4 or 5 and chroma of 2 or 3. The Bt horizon has value of 4 or 5 and chroma of 2 to 4. The 2Bt horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 4. It is clay loam or loam.

Flanagan Series

The Flanagan series consists of somewhat poorly drained, moderately slowly permeable soils on till plains and moraines. These soils formed in loess and in the underlying loamy till. Slope ranges from 0 to 2 percent.

Flanagan soils are similar to Ipava soils and commonly are adjacent to Catlin, Dana, and Drummer soils. The moderately well drained Catlin and Dana soils are higher on the landscape than the Flanagan soils. The poorly drained Drummer soils are lower on the landscape than the Flanagan soils. They do not have an argillic horizon. Ipava soils formed entirely in loess.

Typical pedon of Flanagan silt loam, 1,304 feet west and 2,860 feet north of the southeast corner of sec. 34, T. 18 N., R. 13 W.

Ap—0 to 8 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; weak fine granular structure; very friable; few medium and fine roots; slightly acid; clear smooth boundary.

A—8 to 16 inches; very dark gray (10YR 3/1) silt loam, dark gray (10YR 4/1) dry; moderate fine subangular blocky structure; friable; few fine roots; slightly acid; abrupt smooth boundary.

BA—16 to 20 inches; dark brown (10YR 4/3) silty clay loam; few fine prominent yellowish brown (10YR 5/8) mottles; moderate fine subangular blocky structure; friable; few fine roots; many very dark gray (10YR 3/1) organic coatings on faces of peds; slightly acid; abrupt smooth boundary.

Bt1—20 to 34 inches; dark brown (10YR 4/3) silty clay loam; common fine prominent yellowish brown (10YR 5/8) and common medium faint grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure; firm; few fine roots; few distinct very dark gray (10YR 3/1) organic coatings on faces of peds; many distinct dark grayish brown

(10YR 4/2) clay films on faces of peds; slightly acid; clear smooth boundary.

Bt2—34 to 45 inches; dark brown (10YR 4/3) silty clay loam; many medium prominent yellowish brown (10YR 5/8) and many medium faint grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure; firm; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; neutral; clear smooth boundary.

2BC—45 to 56 inches; light olive brown (2.5Y 5/4) clay loam; common fine distinct yellowish brown (10YR 5/4), common fine prominent yellowish brown (10YR 5/8), and many medium distinct grayish brown (10YR 5/2) mottles; weak coarse subangular blocky structure; firm; few faint very dark grayish brown (10YR 3/2) organic coatings along pores; few faint dark grayish brown (10YR 4/2) clay films along pores; less than 5 percent fine gravel; slight effervescence; mildly alkaline; clear smooth boundary.

2C—56 to 60 inches; light olive brown (2.5Y 5/4) loam; few fine prominent yellowish brown (10YR 5/8) and many medium distinct grayish brown (10YR 5/2) mottles; massive; very firm; less than 5 percent fine gravel and 2 percent cobbles; violent effervescence; moderately alkaline.

The thickness of the solum ranges from 45 to 60 inches. The thickness of the overlying loess ranges from 40 to 60 inches. The mollic epipedon is 11 to 18 inches in thickness.

The A horizon has value of 2 or 3 and chroma of 1 or 2. The Bt horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 to 4. The content of clay ranges from 35 to 42 percent in the control section. The 2C horizon is loam, silt loam, or silty clay loam.

Harpster Series

The Harpster series consists of poorly drained, moderately permeable soils on till plains and outwash plains. These soils formed in silty material. Slope ranges from 0 to 2 percent.

Harpster soils are similar to Pella soils and commonly are adjacent to Brenton, Drummer, and Flanagan soils. The somewhat poorly drained Brenton and Flanagan soils are higher on the landscape than the Harpster soils. Drummer and Pella soils do not have a shallow calcic horizon. They formed in loess or silty material and in the underlying outwash.

Typical pedon of Harpster silty clay loam, 650 feet south and 1,000 feet east of the northwest corner of sec. 32, T. 18 N., R. 13 W.

Apk—0 to 8 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; weak very fine granular structure; friable; common (8 percent) fine irregular concretions of calcium carbonate and common small snail-shell fragments; violent effervescence; moderately alkaline; abrupt smooth boundary.

Ak—8 to 12 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine granular structure; friable; common (8 percent) fine irregular concretions of calcium carbonate and common small snail-shell fragments; violent effervescence; moderately alkaline; abrupt smooth boundary.

BAk—12 to 20 inches; dark gray (10YR 4/1) silty clay loam; moderate fine subangular blocky structure; friable; many faint very dark gray (10YR 3/1) organic coatings on faces of peds; common (8 percent) fine irregular concretions of calcium carbonate and common small snail-shell fragments; violent effervescence; moderately alkaline; clear smooth boundary.

Bg1—20 to 26 inches; dark gray (10YR 4/1) silty clay loam; many fine distinct yellowish brown (10YR 5/4) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; common faint very dark gray (10YR 3/1) organic coatings on faces of peds; few fine irregular concretions of calcium carbonate; slight effervescence; mildly alkaline; gradual smooth boundary.

Bg2—26 to 35 inches; gray (2.5Y 5/1) silty clay loam; many medium prominent yellowish brown (10YR 5/4) mottles; moderate medium prismatic structure; firm; common faint gray (10YR 5/1) coatings on faces of peds; few fine irregular concretions of calcium carbonate; slight effervescence; mildly alkaline; gradual smooth boundary.

BCg—35 to 41 inches; light gray (2.5Y 6/1) silt loam; many medium prominent yellowish brown (10YR 5/6) mottles; weak medium prismatic structure; friable; few faint gray (10YR 5/1) coatings on faces of peds; few fine irregular concretions of calcium carbonate; strong effervescence; moderately alkaline; diffuse smooth boundary.

Cg—41 to 60 inches; light gray (2.5Y 6/1) silt loam; about 25 percent sand; many medium prominent yellowish brown (10YR 5/6) mottles; massive; friable; few fine irregular concretions of calcium carbonate; 1 percent fine gravel; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 30 to 45 inches. The depth to the calcic horizon ranges from 0 to 16 inches. The mollic epipedon is 11 to 16 inches in thickness.

The A horizon has hue of 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 or 1. The Bg horizon has hue of 10YR or 2.5Y or is neutral in hue. It has value of 4 to 6 and chroma of 0 to 2. It is silt loam, loam, or silty clay loam in the lower part. The C horizon is silt loam, loam, sandy loam, or clay loam.

Ipava Series

The Ipava series consists of somewhat poorly drained, moderately slowly permeable soils on till plains and outwash plains. These soils formed in loess. Slope ranges from 0 to 2 percent.

Ipava soils are similar to Flanagan soils and commonly are adjacent to Sable soils. Flanagan soils formed in loess and in the underlying loamy till. The poorly drained Sable soils are lower on the landscape than the Ipava soils.

Typical pedon of Ipava silt loam, 840 feet east and 440 feet north of the southwest corner of sec. 6, T. 19 N., R. 10 W.

Ap—0 to 8 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; moderate fine granular structure; friable; medium acid; abrupt smooth boundary.

A—8 to 14 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; moderate very fine subangular blocky structure; friable; medium acid; clear smooth boundary.

Bt1—14 to 21 inches; brown (10YR 4/3) silty clay loam; few fine distinct yellowish brown (10YR 5/6) and few fine distinct light brownish gray (2.5Y 6/2) mottles; moderate fine subangular blocky structure; friable; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few faint dark grayish brown (10YR 4/2) clay films on faces of peds; slightly acid; clear smooth boundary.

Bt2—21 to 29 inches; brown (10YR 4/3) silty clay loam; common fine prominent yellowish brown (10YR 5/8) and few fine faint light brownish gray (2.5Y 6/2) mottles; moderate medium subangular blocky structure; friable; common faint very dark gray (10YR 3/1) organic coatings on faces of peds; common faint dark gray (10YR 4/1) clay films on faces of peds; neutral; clear smooth boundary.

Bt3—29 to 37 inches; brown (10YR 5/3) silty clay loam; common medium prominent strong brown (7.5YR 5/8) and common fine distinct light brownish gray (2.5Y 6/2) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few distinct very dark gray (10YR 3/1) organic coatings on faces of peds; common distinct dark gray (10YR 4/1) clay films on faces of peds; neutral; clear smooth boundary.

Bt4—37 to 46 inches; grayish brown (2.5Y 5/2) silty clay loam; common medium prominent strong brown (7.5YR 5/8) and common fine faint light brownish gray (2.5Y 6/2) mottles; weak medium prismatic structure; firm; few distinct very dark grayish brown (10YR 3/2) clay films lining pores; mildly alkaline; clear smooth boundary.

Cg—46 to 60 inches; light brownish gray (2.5Y 6/2) silt loam; many medium prominent strong brown (7.5YR 5/8) mottles; massive; firm; few fine rounded black (N 2/0) concretions of iron and manganese oxides; slight effervescence; mildly alkaline.

The thickness of the solum ranges from 40 to 55 inches. The mollic epipedon is 12 to 18 inches in thickness.

The A horizon has chroma of 1 or 2. The Bt horizon has chroma of 2 to 4. The content of clay ranges from 35 to 42 percent in the control section. The C horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 to 3.

Jasper Series

The Jasper series consists of well drained, moderately permeable soils on uplands. These soils formed in loamy outwash. Slope ranges from 0 to 10 percent.

Jasper soils are similar to Wea soils and commonly are adjacent to Brenton, Drummer, and La Hogue soils. The somewhat poorly drained Brenton and La Hogue soils and the poorly drained Drummer soils are lower on the landscape than the Jasper soils. Wea soils formed in loess and in the underlying loamy and gravelly sediments.

Typical pedon of Jasper loam, 2 to 5 percent slopes, 1,600 feet west and 100 feet south of the northeast corner of sec. 9, T. 19 N., R. 13 W.

Ap—0 to 10 inches; very dark gray (10YR 3/1) loam, gray (10YR 5/1) dry; moderate very fine granular structure; friable; slightly acid; abrupt smooth boundary.

A—10 to 19 inches; very dark gray (10YR 3/1) loam, gray (10YR 5/1) dry; weak very fine subangular blocky structure parting to moderate fine granular; friable; slightly acid; clear smooth boundary.

Bt1—19 to 27 inches; dark yellowish brown (10YR 4/4) clay loam; moderate fine subangular blocky structure; friable; common distinct dark brown (10YR 4/3) clay films on faces of peds; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; slightly acid; clear smooth boundary.

Bt2—27 to 38 inches; dark yellowish brown (10YR 4/4) clay loam; moderate medium subangular blocky structure; friable; many faint dark brown (10YR 4/3) clay films on faces of peds; medium acid; diffuse smooth boundary.

Bt3—38 to 49 inches; dark yellowish brown (10YR 4/4) clay loam; moderate medium subangular blocky structure; friable; common faint dark brown (10YR 4/3) clay films on faces of peds; medium acid; gradual smooth boundary.

C—49 to 67 inches; dark yellowish brown (10YR 4/4), stratified loam, sandy loam, loamy sand, and sand; massive; friable; medium acid.

The thickness of the solum ranges from 45 to 60 inches. The surface layer is 7 to 20 inches in thickness.

The A horizon has value of 2 or 3 and chroma of 1 to 3. The Bt horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6.

Jasper loam, 5 to 10 percent slopes, eroded, has a thinner dark surface layer than is defined as the range for the series. This difference, however, does not significantly affect the use or behavior of the soil. This soil is classified as fine-loamy, mixed, mesic Mollic Hapludalfs.

Kendall Series

The Kendall series consists of somewhat poorly drained, moderately permeable soils on outwash plains and stream terraces. These soils formed in loess and in the underlying outwash. Slope ranges from 0 to 2 percent.

Kendall soils are similar to Fincastle, Starks, Whitaker, and Whitaker Variant soils and commonly are adjacent to Camden and Drummer soils. The well drained Camden soils are higher on the landscape than the Kendall soils. The poorly drained Drummer soils are lower on the landscape than the Kendall soils. They have a mollic epipedon. Fincastle soils formed in loess and in the underlying loamy till. Starks soils formed in a thinner layer of loess than the Kendall soils and in the underlying outwash. Whitaker soils formed in loamy outwash. Whitaker Variant soils formed in loamy outwash and in the underlying silty till.

Typical pedon of Kendall silt loam, 1,000 feet west and 100 feet north of the southeast corner of sec. 9, T. 19 N., R. 13 W.

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

E—7 to 15 inches; grayish brown (10YR 5/2) silt loam, light gray (10YR 7/2) dry; many medium faint brown (10YR 5/3) and few fine distinct yellowish brown (10YR 5/6) mottles; weak medium platy structure; friable; few distinct dark grayish brown (10YR 4/2) organic coatings on faces of peds; strongly acid; clear smooth boundary.

Bt1—15 to 25 inches; brown (10YR 5/3) silty clay loam; common fine distinct yellowish brown (10YR 5/6) mottles; moderate fine subangular blocky structure; firm; many faint grayish brown (10YR 5/2) clay films on faces of peds; strongly acid; gradual smooth boundary.

Bt2—25 to 36 inches; brown (10YR 5/3) silty clay loam; many fine distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; many faint grayish brown (10YR 5/2) clay films on faces of peds; very strongly acid; gradual smooth boundary.

Bt3—36 to 42 inches; grayish brown (10YR 5/2) silty clay loam; many fine distinct yellowish brown (10YR 5/6) and many medium faint brown (10YR 5/3) mottles; moderate medium subangular blocky structure; friable; common faint gray (10YR 5/1) clay films on faces of peds; strongly acid; clear smooth boundary.

2BC—42 to 49 inches; brown (10YR 4/3), stratified loam, sandy loam, and clay loam; many medium distinct yellowish brown (10YR 5/6) and common fine faint grayish brown (10YR 5/2) mottles; weak medium subangular blocky structure; friable; strongly acid; gradual smooth boundary.

2C—49 to 60 inches; brown (10YR 4/3), stratified loam, sandy loam, and sandy clay loam; many medium distinct yellowish brown (10YR 5/6) and common fine faint grayish brown (10YR 5/2) mottles; massive; friable; strongly acid.

The thickness of the solum ranges from 45 to 55 inches. The thickness of the overlying loess ranges from 40 to 60 inches. The surface soil is 9 to 18 inches in thickness.

The A horizon has value of 4 or 5 and chroma of 2 or 3. The Bt horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 4. The 2Bt or 2BC horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 2 to 4. It is loam, clay loam, sandy loam, or silt loam. The 2C horizon is stratified silt loam, loam, sandy loam, sandy clay loam, or clay loam.

Keomah Series

The Keomah series consists of somewhat poorly drained, moderately slowly permeable soils on till plains and outwash plains. These soils formed in loess. Slope ranges from 0 to 2 percent.

Keomah soils are similar to Blount and Sabina soils and commonly are adjacent to Ipava and Sable soils. Blount soils formed in silty material and in the underlying silty till. Ipava soils have a mollic epipedon. Sabina soils formed in loess and in the underlying loamy till. The poorly drained Sable soils are lower on the landscape than the Keomah soils. They have a mollic epipedon.

Typical pedon of Keomah silt loam, 2,540 feet west and 2,600 feet south of the northeast corner of sec. 2, T. 19 N., R. 11 W.

Ap—0 to 8 inches; silt loam, 70 percent dark grayish brown (10YR 4/2) and 30 percent light brownish gray (10YR 6/2); light brownish gray (10YR 6/2) and light gray (10YR 7/1) dry; weak fine granular structure; friable; medium acid; abrupt smooth boundary.

E—8 to 11 inches; light brownish gray (10YR 6/2) silt loam, light gray (10YR 7/1) dry; few fine distinct brown (10YR 5/3) and few fine distinct yellowish brown (10YR 5/6) mottles; weak medium platy structure parting to weak very fine subangular blocky; friable; few fine rounded concretions of iron and manganese oxides; strongly acid; clear smooth boundary.

BE—11 to 14 inches; yellowish brown (10YR 5/4) silt loam; many fine distinct light brownish gray (10YR 6/2) and common fine distinct yellowish brown (10YR 5/6) mottles; moderate very fine subangular blocky structure; friable; many distinct light brownish gray (10YR 6/2) silt coatings on faces of peds; common fine rounded concretions of iron and manganese oxides; very strongly acid; clear smooth boundary.

Bt1—14 to 22 inches; yellowish brown (10YR 5/4) silty clay; many fine distinct light brownish gray (10YR 6/2) and many fine distinct yellowish brown (10YR 5/6) mottles; moderate fine subangular blocky structure; firm; many distinct grayish brown (10YR 5/2) clay films on faces of peds; common fine rounded concretions of iron and manganese oxides; strongly acid; gradual smooth boundary.

Bt2—22 to 32 inches; yellowish brown (10YR 5/4) silty clay loam; many fine distinct grayish brown (10YR 5/2) and many fine distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; common distinct grayish brown (10YR 5/2) and few distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common fine rounded concretions of iron and manganese oxides; slightly acid; gradual smooth boundary.

Bt3—32 to 42 inches; light olive brown (2.5Y 5/4) silt loam; many fine prominent grayish brown (10YR 5/2) and many fine prominent yellowish brown (10YR 5/6) mottles; weak coarse subangular blocky structure; friable; few distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine rounded concretions of iron and manganese oxides; neutral; gradual smooth boundary.

C—42 to 62 inches; light brownish gray (2.5Y 6/2) silt loam; many fine distinct light yellowish brown (2.5Y 6/4) and many fine prominent yellowish brown (10YR 5/6) mottles; massive; friable; few distinct very dark grayish brown (10YR 3/2) organic coatings lining pores; few medium rounded nodules of calcium carbonate; slight effervescence; moderately alkaline.

The thickness of the solum ranges from 40 to 52 inches. The surface soil is 10 to 16 inches in thickness.

The A horizon has chroma of 1 or 2. The Bt horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 to 4. The C horizon has value of 4 to 6 and chroma of 2 to 4.

La Hogue Series

The La Hogue series consists of somewhat poorly drained, moderately permeable soils on outwash plains and stream terraces. These soils formed in loamy outwash. Slope ranges from 0 to 2 percent.

La Hogue soils are similar to Andres soils and commonly are adjacent to Drummer, Jasper, and Selma soils. Andres soils formed in loamy outwash and in the underlying silty till. The poorly drained Drummer and Selma soils are lower on the landscape than the La Hogue soils. The well drained Jasper soils are higher on the landscape than the La Hogue soils.

Typical pedon of La Hogue loam, 750 feet west and 80 feet south of the northeast corner of sec. 28, T. 22 N., R. 12 W.

Ap—0 to 5 inches; very dark gray (10YR 3/1) loam, gray (10YR 5/1) dry; weak very fine granular structure; friable; slightly acid; abrupt smooth boundary.

A—5 to 12 inches; very dark gray (10YR 3/1) loam, gray (10YR 5/1) dry; moderate very fine granular structure; friable; slightly acid; abrupt smooth boundary.

BA—12 to 17 inches; brown (10YR 4/3) loam; few fine faint dark grayish brown (10YR 4/2) mottles; moderate very fine subangular blocky structure; friable; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; medium acid; clear smooth boundary.

Bt1—17 to 26 inches; dark yellowish brown (10YR 4/4) clay loam; many fine prominent strong brown (7.5YR 5/6) and common fine distinct grayish brown (10YR 5/2) mottles; moderate fine subangular blocky structure; friable; many distinct brown (10YR

4/3) clay films on faces of peds; few fine irregular accumulations of iron and manganese oxides; 3 percent fine and medium gravel; medium acid; clear smooth boundary.

Bt2—26 to 39 inches; brown (10YR 4/3) clay loam; many prominent strong brown (7.5YR 5/6) and many fine faint grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure; friable; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common medium irregular accumulations of iron and manganese oxides; 10 percent fine and medium gravel; slightly acid; gradual smooth boundary.

BC—39 to 43 inches; brown (10YR 4/3), stratified loamy coarse sand to clay loam; many fine prominent strong brown (7.5YR 5/6) and common fine faint grayish brown (10YR 5/2) mottles; weak medium subangular blocky structure; friable; few faint dark grayish brown (10YR 4/2) clay films on faces of peds; few fine irregular accumulations of iron and manganese oxides; 10 percent fine and medium gravel; neutral; clear smooth boundary.

C—43 to 60 inches; brown (10YR 4/3), stratified loamy coarse sand to clay loam; many fine prominent strong brown (7.5YR 5/6) and common fine faint grayish brown (10YR 5/2) mottles; massive; friable; few fine irregular accumulations of iron and manganese oxides; 10 percent fine and medium gravel; slightly acid.

The thickness of the solum ranges from 40 to 57 inches. The mollic epipedon is 10 to 16 inches in thickness.

The A horizon has value of 2 or 3 and chroma of 1 or 2. The Bt horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 6. It is clay loam, loam, or sandy clay loam. The C horizon has colors similar to those of the Bt horizon. It is stratified loam, silt loam, sandy loam, clay loam, loamy sand, and loamy coarse sand.

Landes Series

The Landes series consists of well drained soils on flood plains. These soils formed in loamy and sandy alluvium. Permeability is moderately rapid in the solum and rapid in the underlying material. Slope ranges from 0 to 3 percent.

Landes soils are similar to Rossburg soils and commonly are adjacent to Morley, Shaffton, and Strawn soils. Morley soils formed in silty till or in silty material and in the underlying silty till. They are on uplands. Rossburg soils formed in loamy alluvium. The somewhat poorly drained Shaffton soils are lower on the flood plains than the Landes soils. Strawn soils formed in loamy till. They are on uplands.

Typical pedon of Landes fine sandy loam, rarely flooded, 0 to 3 percent slopes, 1,300 feet south and 180 feet west of the northeast corner of sec. 17, T. 20 N., R. 12 W.

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) fine sandy loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; slight effervescence; moderately alkaline; clear smooth boundary.

A—7 to 16 inches; very dark grayish brown (10YR 3/2) fine sandy loam, grayish brown (10YR 5/2) dry; moderate medium platy structure parting to weak fine granular; friable; mildly alkaline; clear smooth boundary.

Bw1—16 to 24 inches; brown (10YR 5/3) fine sandy loam; moderate medium platy structure parting to weak fine subangular blocky; friable; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; mildly alkaline; clear smooth boundary.

Bw2—24 to 35 inches; brown (10YR 5/3) loamy fine sand; weak medium subangular blocky structure; friable; few distinct very dark grayish brown (10YR 3/2) organic coatings along pores; slight effervescence; mildly alkaline; clear smooth boundary.

C1—35 to 41 inches; brown (10YR 5/3) loamy fine sand; weak medium subangular blocky structure; very friable; strong effervescence; moderately alkaline; clear smooth boundary.

C2—41 to 60 inches; pale brown (10YR 6/3) sand; single grain; loose; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 30 to 40 inches. The mollic epipedon is 10 to 22 inches thick.

The A horizon has value of 2 or 3 and chroma of 1 to 3. The Bw horizon has value of 4 or 5 and chroma of 2 to 4. The content of clay is less than 18 percent in the control section. The C horizon is sand, loamy sand, loamy fine sand, sandy loam, or fine sandy loam.

Lenzburg Series

The Lenzburg series consists of well drained, moderately slowly permeable soils in surface-mined areas. These soils formed in excavated material. Slope ranges from 1 to 70 percent.

Lenzburg soils are similar to Orthents and commonly are adjacent to areas of water and to soils that formed in undisturbed glacial drift. The somewhat poorly drained to well drained Orthents are in borrow and fill areas.

Typical pedon of Lenzburg loam, 1 to 7 percent slopes, 130 feet west and 2,600 feet south of the northeast corner of sec. 3, T. 19 N., R. 12 W.

A—0 to 2 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; moderate very fine granular structure; friable; 10 percent rounded stones, cobbles, and channers more than 3 inches in length; 4 percent pebbles and channers less than 3 inches in length; mildly alkaline; slight effervescence; abrupt smooth boundary.

C1—2 to 21 inches; mixed loam till and clay; 80 percent dark grayish brown (10YR 4/2) loam till; few medium distinct yellowish brown (10YR 5/6) mottles; massive; firm; 5 percent pebbles and channers less than 3 inches in length; 8 percent cobbles and channers more than 3 inches in length; few weakly cemented very firm fragments of shale; few fragments of coal; 20 percent light gray (N 6/0) clay; few fine prominent light olive brown (2.5Y 5/4) mottles; moderate medium platy rocklike structure; firm; few distinct dark reddish brown (5YR 3/2) coatings on structural faces; strong effervescence; moderately alkaline; diffuse wavy boundary; horizon discontinuous laterally and of widely varying thickness.

C2—21 to 60 inches; mixed 50 percent dark grayish brown (10YR 4/2) and 45 percent brown (7.5YR 4/2) loam till and 5 percent light gray (N 6/0) clay; many medium distinct light olive brown (2.5Y 5/4) mottles; massive; firm; 4 percent pebbles and channers less than 3 inches in length; 8 percent cobbles and channers more than 3 inches in length; few weakly cemented very firm fragments of shale; few fragments of coal; strong effervescence; moderately alkaline; horizon discontinuous laterally and of widely varying thickness.

The content of rock fragments in the control section ranges from 10 to 35 percent, by volume. The rock fragments range from 2 millimeters to 15 centimeters in diameter, but some much larger stones and boulders are included.

The A horizon has hue of 10YR, 2.5Y, or 5Y, value of 3 to 5, and chroma of 1 to 4. It is loam, clay loam, silt loam, silty clay loam, or the channery or gravelly analogs of these textures. The C horizon has hue of 10YR or 7.5YR or is neutral in hue. It has value of 2 to 6 and chroma of 0 to 6. Some of the colors are relict and are not indicative of soil drainage. The texture is dominantly loam, clay, clay loam, silt loam, silty clay loam, or the channery or gravelly analogs of these textures.

Lisbon Series

The Lisbon series consists of somewhat poorly drained, moderately slowly permeable soils on till plains and moraines. These soils formed in loess or silty material and in the underlying loamy till. Slope ranges from 0 to 2 percent.

Lisbon soils are similar to Elburn, Brenton, and Raub soils and commonly are adjacent to Corwin and Drummer soils. Brenton and Elburn soils formed in loess and in the underlying outwash. They have a thicker solum than the Lisbon soils. The moderately well drained Corwin soils are higher on the landscape than the Lisbon soils. The poorly drained Drummer soils are lower on the landscape than the Lisbon soils. Raub soils have a thicker solum than the Lisbon soils.

Typical pedon of Lisbon silt loam, 240 feet west and 800 feet north of the southeast corner of sec. 6, T. 23 N., R. 10 W.

Ap—0 to 7 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; weak very fine granular structure; friable; slightly acid; abrupt smooth boundary.

A—7 to 11 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; moderate medium angular blocky structure parting to weak very fine granular; friable; slightly acid; clear smooth boundary.

BA—11 to 16 inches; dark brown (10YR 4/3) silty clay loam; few fine faint dark grayish brown (10YR 4/2) mottles; moderate very fine subangular blocky structure; friable; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few fine rounded iron concretions; slightly acid; clear smooth boundary.

Bt1—16 to 25 inches; dark grayish brown (2.5Y 4/2) silty clay loam; many medium distinct dark brown (10YR 4/3) and common fine prominent yellowish brown (10YR 5/6) mottles; moderate fine subangular blocky structure; friable; common distinct dark grayish brown clay films on faces of peds; common fine rounded concretions of iron and manganese oxides; neutral; clear smooth boundary.

2Bt2—25 to 35 inches; grayish brown (2.5Y 5/2) clay loam; many fine prominent yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; friable; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common fine rounded concretions of iron and manganese oxides; neutral; gradual smooth boundary.

2BC—35 to 39 inches; grayish brown (2.5Y 5/2) clay loam; many medium prominent light olive brown (2.5Y 5/6) mottles; weak medium subangular blocky structure; friable; few faint dark grayish brown (2.5Y 4/2) clay films on faces of peds; few fine rounded concretions of iron and manganese oxides; 3 percent fine gravel; slight effervescence; neutral; gradual smooth boundary.

2C—39 to 60 inches; light brownish gray (2.5Y 6/2) loam; many medium prominent light olive brown (2.5Y 5/6) mottles; massive; firm; common fine irregular concretions of calcium carbonate; 3 percent fine gravel; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 34 to 46 inches. The thickness of the loess ranges from 23 to 38 inches. The mollic epipedon is 10 to 16 inches in thickness.

The A horizon has value of 2 or 3 and chroma of 1 or 2. The Bt and 2Bt horizons have hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 6. They are silty clay loam or clay loam.

Marseilles Series

The Marseilles series consists of well drained soils on uplands. These soils formed in loamy material and in the underlying siltstone residuum. Slope ranges from 40 to 80 percent.

Marseilles soils commonly are adjacent to Landes and Xenia soils. These adjacent soils do not have bedrock within a depth of 60 inches. They are on the less sloping parts of the landscape. Landes soils formed in loamy and sandy alluvium on flood plains. The moderately well drained Xenia soils formed in loess and in the underlying loamy till.

The Marseilles soils in this county contain less clay in the control section than is definitive for the series and are on steeper slopes. These differences, however, do not significantly affect the use or behavior of the soils.

Typical pedon of Marseilles loam, 40 to 80 percent slopes, 1,100 feet west and 440 feet north of the southeast corner of sec. 16, T. 19 N., R. 12 W.

A—0 to 3 inches; very dark gray (10YR 3/1) loam, gray (10YR 5/1) dry; moderate very fine granular structure; friable; 3 percent fine gravel; neutral; abrupt smooth boundary.

E—3 to 6 inches; dark grayish brown (10YR 4/2) loam, grayish brown (10YR 4/2) dry; moderate very fine granular structure; friable; 3 percent fine gravel; neutral; abrupt smooth boundary.

Bt1—6 to 12 inches; dark brown (10YR 4/3) silt loam; moderate very fine subangular blocky structure; few faint grayish brown (10YR 5/2) clay films on faces of peds; friable; 1 percent fine gravel; neutral; gradual smooth boundary.

2Bt2—12 to 19 inches; grayish brown (2.5Y 5/3) silt loam; common medium prominent yellowish brown (10YR 5/6) mottles; moderate very fine subangular blocky structure; few faint grayish brown (2.5Y 5/2) clay films on faces of peds; friable; 1 percent medium channers; medium acid; clear smooth boundary.

2BC—19 to 23 inches; grayish brown (2.5Y 5/2) silt loam; few fine prominent yellowish brown (10YR 5/6) mottles; moderate fine subangular blocky structure; firm; neutral; abrupt smooth boundary.

2Cr1—23 to 25 inches; 70 percent gray (2.5Y 5/1), soft siltstone and 30 percent yellowish brown (10YR 5/6), hard sandstone; weakly cemented; neutral.

2Cr2—25 inches; siltstone bedrock.

The thickness of the solum ranges from 20 to 36 inches.

The A horizon has value of 3 or 4 and chroma of 1 or 2. The Bt horizon has value of 4 or 5 and chroma of 2 or 3. The 2Bt horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 or 3. The 2Cr horizon is variable in texture and color because of the variability of the siltstone and sandstone. It is extremely firm and has platy structure inherited from the parent material.

Martinsville Series

The Martinsville series consists of well drained, moderately permeable soils on outwash plains and stream terraces. These soils formed in loamy outwash. Slope ranges from 2 to 35 percent.

Martinsville soils are similar to Ockley soils and commonly are adjacent to Drummer and Kendall soils. The poorly drained Drummer and somewhat poorly drained Kendall soils are lower on the landscape than the Martinsville soils. Ockley soils formed in loamy and gravelly sediments or in loess and in the underlying loamy and gravelly sediments.

Typical pedon of Martinsville loam, 2 to 5 percent slopes, 1,300 feet west and 1,440 feet north of the southeast corner of sec. 9, T. 19 N., R. 13 W.

Ap—0 to 7 inches; dark brown (10YR 4/3) loam, pale brown (10YR 6/3) dry; weak fine granular structure; very friable; few fine pebbles; medium acid; abrupt smooth boundary.

BE—7 to 10 inches; dark yellowish brown (10YR 4/4) loam; moderate fine subangular blocky structure; very friable; common faint dark brown (10YR 4/3) organic coatings on faces of peds; medium acid; clear smooth boundary.

Bt1—10 to 17 inches; dark yellowish brown (10YR 4/4) clay loam; moderate fine subangular blocky structure; friable; many faint dark brown (10YR 4/3) clay films on faces of peds; medium acid; clear smooth boundary.

Bt2—17 to 30 inches; dark yellowish brown (10YR 4/4) sandy clay loam; moderate medium subangular blocky structure; friable; many faint dark brown (10YR 4/3) clay films on faces of peds; slightly acid; gradual smooth boundary.

Bt3—30 to 49 inches; dark yellowish brown (10YR 4/4), stratified sandy clay loam and sandy loam; moderate medium subangular blocky structure; very friable; common faint dark brown (10YR 4/3) clay films on faces of peds; slightly acid; gradual smooth boundary.

BC—49 to 58 inches; yellowish brown (10YR 5/4), stratified sandy clay loam and sandy loam; weak medium subangular blocky structure; very friable; slightly acid; gradual smooth boundary.

C—58 to 65 inches; yellowish brown (10YR 5/4), stratified loamy sand and sandy loam; single grain; loose; 1 percent fine gravel; slightly acid.

The thickness of the solum ranges from 45 to 60 inches. The surface layer is 4 to 10 inches in thickness.

The A or Ap horizon has value of 3 to 5 and chroma of 2 to 4. It is loam or sandy loam. The Bt horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6. It is clay loam, loam, sandy clay loam, or sandy loam. The C horizon is stratified sand, loamy sand, sandy loam, loam, gravelly loam, and clay loam.

Miami Series

The Miami series consists of well drained, moderately permeable or moderately slowly permeable soils on uplands. These soils formed in loamy till. Slope ranges from 5 to 35 percent.

Miami soils are similar to Strawn soils and commonly are adjacent to Drummer and Xenia soils. The poorly drained Drummer soils are lower on the landscape than the Miami soils. Strawn soils have a thinner solum than the Miami soils. They are on the more sloping parts of the landscape. The moderately well drained Xenia soils are on the less sloping parts of the landscape.

Typical pedon of Miami loam, 16 to 35 percent slopes, 2,200 feet east and 1,500 feet south of the northwest corner of sec. 25, T. 19 N., R. 13 W.

A—0 to 4 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; moderate very fine granular structure; friable; medium acid; clear smooth boundary.

E—4 to 8 inches; brown (10YR 5/3) loam, light gray (10YR 7/2) dry; weak fine subangular blocky structure; friable; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; medium acid; clear smooth boundary.

BE—8 to 11 inches; yellowish brown (10YR 5/4) loam; moderate very fine subangular blocky structure; friable; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; medium acid; clear smooth boundary.

Bt1—11 to 20 inches; yellowish brown (10YR 5/4) clay loam; moderate fine subangular blocky structure; firm; common faint dark yellowish brown (10YR 4/4) clay films on faces of peds; 5 percent fine and medium gravel; medium acid; gradual smooth boundary.

Bt2—20 to 33 inches; dark yellowish brown (10YR 4/4) clay loam; moderate medium subangular blocky structure; firm; common faint dark brown (10YR 4/3) clay films on faces of peds; 5 percent fine and medium gravel; few fine irregular accumulations of iron and manganese oxides; medium acid; clear smooth boundary.

BC—33 to 38 inches; dark yellowish brown (10YR 4/4) clay loam; weak medium subangular blocky structure; firm; few faint dark brown (10YR 4/3) clay films on faces of peds; 5 percent fine and medium gravel; mildly alkaline; slight effervescence; clear smooth boundary.

C—38 to 60 inches; yellowish brown (10YR 5/4) loam; massive; firm; 5 percent fine and medium gravel; mildly alkaline; slight effervescence.

The thickness of the solum ranges from 30 to 40 inches. The depth to free carbonates ranges from 20 to 40 inches. The surface soil is 6 to 12 inches in thickness.

The A horizon has value of 3 to 5 and chroma of 1 to 4. The Bt horizon has hue of 10YR or 2.5Y and value and chroma of 4 to 6. It is silty clay loam. The C horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 3 to 6.

Milford Series

The Milford series consists of poorly drained, moderately slowly permeable soils on uplands. These soils formed in silty and loamy sediments. Slope ranges from 0 to 2 percent.

Milford soils are similar to Ashkum and Bryce soils and commonly are adjacent to Ashkum, Lisbon, and Saybrook soils. Ashkum soils formed in silty sediments and in the underlying silty till. Bryce soils formed in clayey sediments and in the underlying clayey till. The somewhat poorly drained Lisbon and moderately well drained Saybrook soils are higher on the landscape than the Milford soils.

Typical pedon of Milford silty clay loam, 1,300 feet west and 120 feet south of the northeast corner of sec. 3, T. 23 N., R. 11 W.

Ap—0 to 8 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate very fine granular structure; friable; slightly acid; abrupt smooth boundary.

A—8 to 14 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; weak fine subangular blocky structure parting to moderate very fine granular; friable; neutral; clear smooth boundary.

AB—14 to 18 inches; very dark gray (10YR 3/1) silty clay loam, grayish brown (10YR 5/2) dry; weak fine subangular blocky structure parting to moderate very fine granular; friable; neutral; clear smooth boundary.

Bg1—18 to 25 inches; dark grayish brown (2.5Y 4/2) silty clay loam stratified with thin bands of clay loam; few fine prominent light olive brown (2.5Y 5/6) and common fine distinct gray (2.5Y 5/2) mottles; moderate fine subangular blocky structure; firm; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds; neutral; gradual smooth boundary.

Bg2—25 to 41 inches; dark grayish brown (2.5Y 4/2) silty clay loam stratified with thin bands of clay loam; common fine prominent light olive brown (2.5Y 5/6) and many fine faint gray (2.5Y 5/2) mottles; moderate medium subangular blocky structure; firm; common distinct very dark gray (10YR 3/1) organic coatings and common distinct dark gray (10YR 4/1) coatings on faces of peds; few fine rounded concretions of iron and manganese oxides; neutral; diffuse smooth boundary.

BCg—41 to 52 inches; gray (2.5Y 5/1) silty clay loam stratified with thin bands of clay loam and loam; many medium prominent light olive brown (2.5Y 5/6) mottles; weak medium subangular blocky structure; friable; few distinct dark gray (10YR 4/1) coatings on faces of peds; few fine rounded concretions of iron and manganese oxides; neutral; diffuse smooth boundary.

Cg—52 to 60 inches; mottled 50 percent gray (2.5Y 5/1) and 50 percent light olive brown (2.5Y 5/6), stratified silty clay loam, clay loam, and loam; massive; friable; 5 percent fine gravel; neutral.

The thickness of the solum ranges from 42 to 60 inches. The mollic epipedon is 12 to 24 inches in thickness.

The A horizon has hue of 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 or 1. The Bg horizon has hue of 10YR, 2.5Y, or 5Y or is neutral in hue. It has value of 4 to 6 and chroma of 0 to 2. It is silty clay loam or silty clay in the upper part and has strata of clay loam, loam, silty clay loam, or sandy loam in the lower part. The C horizon is stratified sandy loam to silty clay loam.

Mokena Series

The Mokena series consists of somewhat poorly drained, slowly permeable or moderately slowly permeable soils on uplands. These soils formed in silty material and loamy outwash and in the underlying clayey till. Slope ranges from 0 to 2 percent.

Mokena soils are similar to Andres and Odell soils and commonly are adjacent to Bryce, Mona, and Rowe soils. Andres soils formed in loamy outwash and in the underlying silty till. The poorly drained Bryce and Rowe soils are lower on the landscape than the Mokena soils. The moderately well drained Mona soils are higher on the landscape than the Mokena soils. Odell soils formed entirely in loamy till.

Typical pedon of Mokena loam, 2,000 feet north and 320 feet east of the southwest corner of sec. 17, T. 23 N., R. 13 W.

Ap—0 to 9 inches; very dark gray (10YR 3/1) loam, gray (10YR 5/1) dry; moderate fine granular structure; friable; slightly acid; abrupt smooth boundary.

A—9 to 13 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; slightly acid; clear smooth boundary.

BA—13 to 17 inches; dark grayish brown (10YR 4/2) loam; few fine faint brown (10YR 5/3) mottles; moderate fine subangular blocky structure; friable; few faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; slightly acid; clear smooth boundary.

Bt1—17 to 27 inches; brown (10YR 5/3) clay loam; common medium faint grayish brown (10YR 5/2) and few fine distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; friable; few distinct very dark grayish brown (10YR 3/2) organic coatings and few distinct dark grayish brown (10YR 4/2) clay films on faces of peds; slightly acid; clear smooth boundary.

Bt2—27 to 37 inches; brown (10YR 5/3) clay loam; common medium faint grayish brown (10YR 5/2), common medium distinct yellowish brown (10YR 5/6), and few fine distinct strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; friable; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; neutral; clear smooth boundary.

Bt3—37 to 43 inches; brown (10YR 5/3) sandy clay loam stratified with sandy loam and clay loam;

common medium prominent brown (10YR 5/8), common medium distinct yellowish brown (10YR 5/6), and common fine faint grayish brown (10YR 5/2) mottles; weak medium subangular blocky structure; friable; few distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine irregular black (N 2/0) accumulations of iron and manganese oxides; neutral; clear smooth boundary.

2BC—43 to 48 inches; grayish brown (2.5Y 5/2) silty clay; common medium distinct yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure; very firm; few fine irregular black (N 2/0) accumulations of iron and manganese oxides; slight effervescence; mildly alkaline; clear smooth boundary.

2C—48 to 60 inches; grayish brown (2.5Y 5/2) silty clay; few medium distinct yellowish brown (10YR 5/6) mottles; massive; very firm; common fine irregular black (N 2/0) accumulations of iron and manganese oxides; strong effervescence; mildly alkaline.

The thickness of the solum ranges from 36 to 52 inches. Some pedons have as much as 22 inches of silty material at the surface. The mollic epipedon is 11 to 15 inches in thickness.

The A horizon has value of 2 or 3 and chroma of 1 or 2. The Bt horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 4. It is clay loam, silty clay loam, sandy clay loam, or sandy loam.

Mona Series

The Mona series consists of moderately well drained, moderately slowly permeable soils on uplands. These soils formed in silty material and loamy outwash and in the underlying clayey till. Slope ranges from 1 to 5 percent.

Mona soils are similar to Corwin and Symerton soils and commonly are adjacent to Clarence, Mokena, and Swygert soils. The somewhat poorly drained Clarence soils formed entirely in clayey till. Corwin soils formed entirely in loamy till. The somewhat poorly drained Mokena soils are lower on the landscape than the Mona soils. The somewhat poorly drained Swygert soils formed in silty material and in the underlying clayey till. Symerton soils formed in loamy outwash and in the underlying silty till.

Typical pedon of Mona silt loam, 1 to 5 percent slopes, 130 feet south and 600 feet west of the northeast corner of sec. 20, T. 23 N., R. 13 W.

Ap—0 to 11 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; moderate fine granular structure; friable; slightly acid; clear smooth boundary.

Bt1—11 to 15 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine subangular blocky structure; friable; common faint brown (10YR 4/3) clay films on faces of peds; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; slightly acid; clear smooth boundary.

Bt2—15 to 29 inches; yellowish brown (10YR 5/4) clay loam; moderate fine subangular blocky structure; friable; common faint brown (10YR 4/3) films on faces of peds; few distinct very dark gray (10YR 3/1) organic coatings on faces of peds; neutral; clear smooth boundary.

2Bt3—29 to 34 inches; yellowish brown (10YR 5/4) clay loam; few fine prominent yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; firm; common faint dark brown (10YR 4/3) clay films on faces of peds; few faint very dark gray (10YR 3/1) organic coatings on faces of peds; neutral; clear smooth boundary.

2Bt4—34 to 39 inches; olive brown (2.5Y 6/6) clay loam; few fine distinct yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; firm; common prominent grayish brown (10YR 4/2) clay films on faces of peds; few fine rounded white (10YR 8/1) accumulations of calcium carbonate; neutral; clear smooth boundary.

3BC—39 to 44 inches; grayish brown (2.5Y 5/2) silty clay; few fine distinct light olive brown (2.5YR 5/6) mottles; weak coarse subangular blocky structure; very firm; 3 percent fine gravel; few fine white (10YR 8/1) accumulations of calcium carbonate; few fine strong brown (7.5YR 5/8) accumulations of iron and manganese oxides; slight effervescence; mildly alkaline; clear smooth boundary.

3C—44 to 60 inches; grayish brown (2.5Y 5/2) silty clay; common medium faint gray (5YR 5/1) and few fine distinct light olive brown (2.5Y 5/6) mottles; massive; very firm; 3 percent fine gravel; few fine rounded white (10YR 8/1) accumulations of calcium carbonate; few fine strong brown (7.5YR 5/8) accumulations of iron and manganese oxides; strong effervescence; mildly alkaline.

The thickness of the solum ranges from 36 to 54 inches. The thickness of the overlying silty material ranges from 10 to 24 inches. The mollic epipedon is 10 to 16 inches in thickness.

The A horizon has value of 2 or 3 and chroma of 1 or 2. The Bt and 2Bt horizons have value of 4 to 6 and chroma of 3 or 4. The 3BC and 3C horizons are silty clay or clay.

Morley Series

The Morley series consists of moderately well drained and well drained, slowly permeable or moderately slowly permeable soils on till plains and moraines. These soils formed in silty till or in silty material and in the underlying silty till. Slope ranges from 5 to 70 percent.

Morley soils are similar to Varna soils and commonly are adjacent to Ashkum and Blount soils. The poorly drained Ashkum soils are lower on the landscape than the Morley soils. The somewhat poorly drained Blount soils are on the less sloping parts of the landscape. The moderately well drained Varna soils have a thicker dark surface layer than the Morley soils.

Typical pedon of Morley silt loam, 18 to 35 percent slopes, 2,440 feet south and 100 feet east of the northwest corner of sec. 7, T. 20 N., R. 11 W.

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

E—5 to 9 inches; yellowish brown (10YR 5/3) silt loam; moderate fine subangular blocky structure parting to moderate fine granular; friable; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; slightly acid; clear smooth boundary.

Bt1—9 to 14 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine subangular blocky structure; friable; few faint dark brown (10YR 4/3) clay films and few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; slightly acid; clear smooth boundary.

2Bt2—14 to 21 inches; light olive brown (10YR 5/4) silty clay loam; moderate medium angular blocky structure; firm; many faint dark brown (10YR 4/3) clay films on faces of peds; 2 percent fine gravel; slightly acid; clear smooth boundary.

2Bt3—21 to 34 inches; light olive brown (2.5Y 5/4) silty clay loam; moderate fine prismatic structure parting to moderate medium subangular blocky; firm; many distinct dark brown (10YR 4/3) clay films on faces of peds; 5 percent fine gravel; neutral; clear smooth boundary.

2BC—34 to 45 inches; light olive brown (2.5Y 5/4) silty clay loam; weak medium prismatic structure; firm; common distinct dark brown (10YR 4/3) clay films on faces of peds; 5 percent fine gravel; mildly alkaline; slight effervescence; clear smooth boundary.

2C—45 to 60 inches; light olive brown (2.5Y 5/4) silty clay loam; massive; firm; very few distinct dark brown (10YR 4/3) coatings on vertical cleavage planes; 5 percent fine gravel; mildly alkaline; strong effervescence.

The thickness of the solum ranges from 26 to 45 inches. The surface soil is 5 to 14 inches in thickness.

The A horizon has value of 3 or 4 and chroma of 1 or 2. The Bt horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 3 to 6. It is silty clay loam or silty clay. The content of clay ranges from 35 to 50 percent in the control section. The C horizon is silty clay loam or clay loam.

Morley silt loam, 35 to 70 percent slopes, contains less clay in the textural control section than is defined as the range for the series. This difference, however, does not significantly affect the use or behavior of the soil. This soil is classified as fine-silty, mixed, mesic Typic Hapludalfs.

Ockley Series

The Ockley series consists of well drained soils on outwash plains and stream terraces. These soils formed in loamy and gravelly sediments or in loess and in the underlying loamy and gravelly sediments. Permeability is moderate in the solum and very rapid in the underlying material. Slope ranges from 1 to 4 percent.

Ockley soils are similar to Martinsville soils and commonly are adjacent to Sawmill, Selma, and Whitaker soils. Martinsville soils formed entirely in loamy outwash. The poorly drained Sawmill soils are on flood plains below the Ockley soils. The poorly drained Selma and somewhat poorly drained Whitaker soils are lower on the landscape than the Ockley soils.

Typical pedon of Ockley loam, 1 to 4 percent slopes, 1,220 feet south and 160 feet east of the northwest corner of sec. 27, T. 22 N., R. 14 W.

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

BE—9 to 15 inches; dark brown (10YR 4/3) loam; moderate very fine subangular blocky structure; friable; many faint dark grayish brown (10YR 4/2) silt coatings on faces of peds; strongly acid; clear smooth boundary.

Bt1—15 to 26 inches; dark yellowish brown (10YR 4/4) clay loam; moderate fine subangular blocky structure; friable; common faint dark brown (10YR 4/3) and brown (7.5YR 4/4) clay films on faces of peds; medium acid; clear smooth boundary.

Bt2—26 to 41 inches; yellowish brown (10YR 5/4) clay loam; moderate medium subangular blocky structure; friable; few faint dark brown (7.5YR 3/2) clay films lining pores; common faint dark brown

(10YR 4/3) clay films on faces of peds; 5 percent gravel; medium acid; clear smooth boundary.

Bt3—41 to 51 inches; dark yellowish brown (10YR 4/4) gravelly clay loam; moderate medium subangular blocky structure; friable; moderate faint dark brown (10YR 4/3) clay films on faces of peds; 20 percent gravel; medium acid; clear smooth boundary.

BC—51 to 58 inches; dark yellowish brown (10YR 4/4) gravelly clay loam; weak coarse subangular blocky structure; friable; 20 percent gravel; neutral; clear smooth boundary.

2C—58 to 70 inches; light yellowish brown (10YR 6/4), stratified sand and very gravelly sand; single grain; loose; 15 percent fine gravel and 35 percent medium and coarse gravel; 2 percent cobbles; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 40 to 72 inches. The surface soil is 6 to 15 inches in thickness.

The A horizon has value of 4 or 5 and chroma of 2 to 4. The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. It is clay loam or gravelly clay loam. The 2C horizon is stratified sand, gravelly sand, or very gravelly sand.

Odell Series

The Odell series consists of somewhat poorly drained, moderately slowly permeable soils on till plains and moraines. These soils formed in loamy till. Slope ranges from 0 to 2 percent.

Odell soils are similar to Andres and Mokena soils and commonly are adjacent to Corwin and Drummer soils. Andres soils formed in loamy outwash and in the underlying silty till. The moderately well drained Corwin soils are higher on the landscape than the Odell soils. The poorly drained Drummer soils are lower on the landscape than the Odell soils. Mokena soils formed in silty material and loamy outwash and in the underlying clayey till.

Typical pedon of Odell loam, 640 feet south and 140 feet east of the northwest corner of sec. 12, T. 23 N., R. 11 W.

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds; 5 percent fine gravel; slightly acid; abrupt smooth boundary.

A—8 to 11 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; moderate very fine subangular blocky structure; friable; many faint very dark gray (10YR 3/1) organic coatings on faces of peds; 5 percent fine gravel; slightly acid; clear smooth boundary.

BA—11 to 16 inches; olive brown (2.5Y 4/4) clay loam; few fine distinct grayish brown (2.5Y 5/2) mottles; moderate very fine subangular blocky structure; friable; many prominent very dark gray (10YR 3/1) organic coatings on faces of peds; 5 percent fine gravel; neutral; clear smooth boundary.

Bt1—16 to 21 inches; olive brown (2.5Y 4/4) clay loam; few fine distinct yellowish brown (10YR 5/6) and common fine distinct grayish brown (2.5Y 5/2) mottles; moderate fine subangular blocky structure; friable; few prominent very dark gray (10YR 3/1) organic coatings lining pores; many distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; few fine rounded concretions of iron and manganese oxides; 8 percent fine gravel; slightly acid; clear smooth boundary.

Bt2—21 to 30 inches; olive brown (2.5Y 4/4) clay loam; few fine distinct yellowish brown (10YR 5/6) and many fine distinct grayish brown (2.5Y 5/2) mottles; moderate medium subangular blocky structure; friable; few prominent very dark gray (10YR 3/1) organic coatings lining pores; common distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; common fine rounded concretions of iron and manganese oxides; 8 percent fine gravel; slightly acid; clear smooth boundary.

BC—30 to 34 inches; light olive brown (2.5Y 5/4) loam; few fine faint yellowish brown (10YR 5/6) and common fine distinct grayish brown (2.5Y 5/2) mottles; weak medium subangular blocky structure; firm; few distinct very dark grayish brown (2.5Y 3/2) organic coatings lining pores; few fine rounded concretions of iron and manganese oxides; 8 percent fine gravel; slight effervescence; mildly alkaline; clear smooth boundary.

C—34 to 60 inches; grayish brown (2.5Y 5/4) loam; common medium faint light brownish gray (2.5Y 6/2) and common medium faint light olive brown (2.5Y 5/4) mottles; strong very coarse prismatic structure; firm; few faint dark grayish brown (2.5Y 4/2) coatings on vertical cleavage planes; 8 percent fine gravel; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 26 to 40 inches. The mollic epipedon is 10 to 18 inches in thickness.

The A horizon has value of 2 or 3 and chroma of 1 or 2. It is loam or silt loam. The Bt horizon has value of 4 to 6 and chroma of 3 or 4. It is clay loam or loam. The C horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 4.

Onarga Series

The Onarga series consists of well drained soils on uplands. These soils formed in loamy and sandy material. Permeability is moderate in the solum and rapid in the underlying material. Slope ranges from 1 to 8 percent.

Onarga soils are similar to Alvin and Sparta soils and commonly are adjacent to Brenton, Drummer, and La Hogue soils. Alvin soils do not have a mollic epipedon. The somewhat poorly drained Brenton and La Hogue soils and the poorly drained Drummer soils are lower on the landscape than the Onarga soils. Sparta soils formed in sandy eolian material.

Typical pedon of Onarga sandy loam, 1 to 5 percent slopes, 50 feet south and 880 feet east of the center of sec. 29, T. 20 N., R. 13 W.

Ap—0 to 13 inches; very dark grayish brown (10YR 3/2) sandy loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; neutral; gradual wavy boundary.

Bt1—13 to 21 inches; dark yellowish brown (10YR 4/4) sandy loam; weak fine subangular blocky structure parting to weak fine granular; friable; common distinct dark brown (7.5YR 4/3) clay films and few distinct very dark gray (10YR 3/1) organic coatings on faces of peds; slightly acid; clear smooth boundary.

Bt2—21 to 32 inches; brown (7.5YR 4/4) sandy loam; weak fine subangular blocky structure; very friable; common distinct dark brown (10YR 4/3) clay films on faces of peds; strongly acid; clear smooth boundary.

C1—32 to 47 inches; dark yellowish brown (10YR 4/6) sand; single grain; loose; strongly acid; clear smooth boundary.

C2—47 to 60 inches; yellowish brown (10YR 5/6) sand; single grain; loose; strongly acid.

The thickness of the solum ranges from 30 to 50 inches. The surface soil is 7 to 20 inches in thickness.

The A horizon has value of 2 or 3 and chroma of 1 to 3. The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6. It is loam, sandy loam, or sandy clay loam. The content of clay ranges from 15 to 18 percent in the control section. The C horizon is stratified sandy loam, loamy sand, sand, loam, or silt loam.

Onarga fine sandy loam, 5 to 8 percent slopes, eroded, has a thinner dark surface layer than is defined as the range for the series. This difference, however, does not significantly affect the use or behavior of the soil. This soil is classified as coarse-loamy, mixed, mesic Mollic Hapludalfs.

Parr Series

The Parr series consists of well drained, moderately slowly permeable soils on till plains and moraines. These soils formed in loamy till. Slope ranges from 5 to 12 percent.

The Parr soils in this county have a thinner dark surface layer than is defined as the range for the series. This difference, however, does not significantly affect the use or behavior of the soils. These soils are classified as fine-loamy, mixed, mesic Mollic Hapludalfs.

Parr soils are similar to Corwin soils and commonly are adjacent to Catlin, Dana, and Flanagan soils. The moderately well drained Catlin, Corwin, and Dana soils are on the less sloping parts of the landscape. The somewhat poorly drained Flanagan soils are lower on the landscape than the Parr soils.

Typical pedon of Parr loam, 5 to 12 percent slopes, severely eroded, 900 feet east and 186 feet north of the southwest corner of sec. 27, T. 17 N., R. 11 W.

Ap—0 to 6 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; mixed with many yellowish brown (10YR 5/4) fragments of subsoil material; weak fine granular structure; friable; 2 percent fine gravel; slightly acid; abrupt smooth boundary.

Bt1—6 to 16 inches; yellowish brown (10YR 5/4) clay loam; moderate fine subangular blocky structure; friable; many faint dark yellowish brown (10YR 4/4) clay films on faces of peds; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; 2 percent fine gravel; slightly acid; clear smooth boundary.

Bt2—16 to 30 inches; yellowish brown (10YR 5/4) clay loam; moderate medium subangular blocky structure; friable; common faint dark yellowish brown (10YR 4/4) clay films on faces of peds; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; 2 percent fine and medium gravel; slightly acid; clear smooth boundary.

BC—30 to 36 inches; brown (10YR 5/3) clay loam; few fine distinct yellowish brown (10YR 5/6) mottles; weak coarse subangular blocky structure; friable; few distinct very dark grayish brown (10YR 3/2) organic coatings lining pores; 4 percent fine and medium gravel; neutral; clear smooth boundary.

C—36 to 60 inches; brown (10YR 5/3) loam; few fine distinct yellowish brown (10YR 5/6) mottles; massive; firm; few distinct very dark grayish brown (10YR 3/2) organic coatings lining pores; 5 percent fine and medium gravel; strong effervescence; mildly alkaline.

The thickness of the solum ranges from 30 to 40 inches. The surface layer is 6 to 10 inches in thickness.

The A horizon has value of 2 or 3 and chroma of 1 to 3. The Bt horizon has value of 4 or 5. The C horizon has chroma of 3 or 4.

Pella Series

The Pella series consists of poorly drained, moderately permeable soils on outwash plains and till plains. These soils formed in loess or silty material and in the underlying outwash. Slope ranges from 0 to 2 percent.

Pella soils are similar to Drummer, Harpster, and Sable soils and commonly are adjacent to Ashkum, Drummer, and Flanagan soils. Ashkum soils formed in silty sediments and in the underlying silty till. Drummer, Flanagan, and Sable soils do not have carbonates within a depth of 40 inches. The somewhat poorly drained Flanagan soils are higher on the landscape than the Pella soils. Harpster soils have a shallow calcic horizon.

Typical pedon of Pella silty clay loam, 1,000 feet south and 1,500 feet west of the northeast corner of sec. 15, T. 19 N., R. 13 W.

Ap—0 to 6 inches; black (10YR 2/1) silty clay loam, gray (10YR 5/1) dry; moderate very fine granular structure; friable; slightly acid; abrupt smooth boundary.

A—6 to 12 inches; black (10YR 2/1) silty clay loam, gray (10YR 5/1) dry; moderate fine angular blocky structure; firm and compacted; neutral; clear smooth boundary.

Bg1—12 to 20 inches; grayish brown (2.5Y 5/2) silty clay loam; few fine faint gray (2.5Y 5/1) and few fine prominent brownish yellow (10YR 6/8) mottles; moderate very fine subangular blocky structure; friable; common distinct very dark brown (10YR 2/2) organic coatings on faces of peds; mildly alkaline; gradual smooth boundary.

Bg2—20 to 28 inches; grayish brown (2.5Y 5/2) silty clay loam; many medium distinct light olive brown (2.5Y 5/4) and few fine prominent brownish yellow (10YR 6/6) mottles; moderate medium subangular blocky structure; friable; few distinct very dark brown (10YR 2/2) organic coatings on faces of peds; few fine irregular accumulations of iron and manganese oxides; slight effervescence; moderately alkaline; abrupt smooth boundary.

2Bkg—28 to 36 inches; light brownish gray (2.5Y 6/2) silt loam; many medium prominent light olive brown (2.5Y 5/4) and common fine prominent yellowish brown (10YR 5/6) mottles; weak coarse subangular blocky structure; friable; common faint gray (2.5Y 5/1) organic coatings on faces of peds; common medium to very coarse irregular concretions of calcium carbonate; violent effervescence; moderately alkaline; gradual smooth boundary.

2Cg—36 to 46 inches; light brownish gray (2.5Y 6/2) silt loam; many medium prominent light olive brown (2.5Y 5/4) and many fine prominent yellowish brown (10YR 5/6) mottles; massive; friable; common medium and coarse irregular concretions of calcium carbonate; 1 percent fine gravel; large black (N 2/0) silty clay loam krotovina; violent effervescence; strongly alkaline; clear smooth boundary.

2C—46 to 60 inches; light olive brown (2.5Y 5/4) loam; many medium prominent gray (N 6/0) mottles; massive; friable; 8 percent fine and medium gravel; large black (N 2/0) silty clay loam krotovina; violent effervescence; strongly alkaline.

The thickness of the solum ranges from 30 to 50 inches. The thickness of the overlying silty material ranges from 35 to 60 inches. The depth to free carbonates ranges from 16 to 40 inches. The mollic epipedon is 12 to 22 inches in thickness.

The A horizon has hue of 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2. The Bg horizon has hue of 5Y, 2.5Y, or 10YR, value of 4 to 6, and chroma of 1 or 2. The Bkg horizon is silt loam, loam, or silty clay loam. The 2C horizon is silt loam, loam, sandy loam, or clay loam.

Peotone Series

The Peotone series consists of very poorly drained, moderately slowly permeable soils on uplands. These soils formed in silty sediments or in mucky silty and clayey sediments. Slope ranges from 0 to 2 percent.

Peotone soils are similar to Rantoul soils and commonly are adjacent to Ashkum and Drummer soils. The poorly drained Ashkum and Drummer soils are higher on the landscape than the Peotone soils. Rantoul soils formed in clayey colluvium.

Typical pedon of Peotone silty clay loam, 1,000 feet south and 2,200 feet east of the northwest corner of sec. 21, T. 21 N., R. 12 W.

Ap—0 to 8 inches; black (N 2/0) silty clay loam, very dark gray (10YR 3/1) dry; moderate fine granular structure; friable; neutral; abrupt smooth boundary.

A—8 to 15 inches; black (N 2/0) silty clay loam, very dark gray (10YR 3/1) dry; weak fine subangular blocky structure parting to moderate fine granular; firm; neutral; clear smooth boundary.

Bg1—15 to 26 inches; black (N 2/0) silty clay loam, very dark gray (10YR 3/1) dry; moderate fine subangular blocky structure; firm; neutral; gradual smooth boundary.

Bg2—26 to 30 inches; very dark grayish brown (2.5Y 3/2) silty clay loam, gray (N 5/0) dry; few fine faint dark grayish brown (2.5Y 4/2) mottles; moderate medium subangular blocky structure; firm; many distinct very dark gray (N 3/0) organic coatings on faces of peds; neutral; gradual smooth boundary.

Bg3—30 to 44 inches; grayish brown (2.5Y 5/2) silty clay loam; common medium distinct dark grayish brown (2.5Y 4/2) and common fine prominent light olive brown (2.5Y 5/6) mottles; moderate medium subangular blocky structure; firm; common distinct very dark gray (N 3/0) organic coatings on faces of peds; neutral; gradual smooth boundary.

Bg4—44 to 56 inches; grayish brown (2.5Y 5/2) silty clay loam; many fine prominent light olive brown (2.5Y 5/6) mottles; weak coarse subangular blocky structure; firm; few distinct very dark gray (N 3/0) organic coatings lining pores; neutral; diffuse smooth boundary.

Cg—56 to 60 inches; grayish brown (2.5Y 5/2) silty clay loam; many fine prominent light olive brown (2.5Y 5/6) mottles; massive; firm; few distinct very dark gray (N 3/0) organic coatings lining pores; few fine rounded concretions of calcium carbonate; slight effervescence; mildly alkaline.

The thickness of the solum ranges from 40 to 60 inches. The mollic epipedon is 24 to 39 inches in thickness.

The A horizon has hue of 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 or 1. It is silty clay loam or mucky silty clay loam. The Bg horizon has hue of 10YR, 2.5Y, or 5Y or is neutral in hue. It has value of 2 to 6 and chroma of 0 to 6. It is silty clay loam, mucky silty clay loam, or mucky silty clay. The content of clay ranges from 35 to 45 percent in the control section. The Cg horizon is stratified silty clay loam, silty clay, or silt loam. Some pedons have a 2C horizon. This horizon has hue of 2.5Y or 5Y, value of 4 or 5, and chroma of 1 to 3.

Plano Series

The Plano series consists of well drained, moderately permeable soils on uplands. These soils formed in loess and in the underlying outwash. Slope ranges from 2 to 5 percent.

Plano soils are similar to Catlin, Dana, Proctor, and Saybrook soils and commonly are adjacent to Drummer and Elburn soils. The moderately well drained Catlin, Dana, and Saybrook soils formed in loess and in the underlying silty or loamy till. The poorly drained Drummer and somewhat poorly drained Elburn soils are lower on the landscape than the Plano soils.

Typical pedon of Plano silt loam, 2 to 5 percent slopes, 1,900 feet west and 1,000 feet north of the southeast corner of sec. 28, T. 18 N., R. 13 W.

Ap—0 to 8 inches; very dark gray (10YR 3/1) silt loam, dark gray (10YR 4/1) dry; weak fine granular structure; very friable; few medium and fine roots; neutral; clear smooth boundary.

A—8 to 13 inches; very dark gray (10YR 3/1) silt loam, dark gray (10YR 4/1) dry; moderate fine subangular blocky structure; friable; few medium and fine roots; slightly acid; clear smooth boundary.

BA—13 to 18 inches; very dark grayish brown (10YR 3/2) silty clay loam, grayish brown (10YR 5/2) dry; moderate fine subangular blocky structure; friable; few fine roots; medium acid; abrupt smooth boundary.

Bt1—18 to 30 inches; dark brown (10YR 4/3) silty clay loam; moderate medium subangular blocky structure; firm; few fine roots; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; common faint dark brown (10YR 3/3) clay films on faces of peds; medium acid; clear smooth boundary.

Bt2—30 to 40 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium angular blocky structure; firm; few fine roots; common distinct very dark grayish brown (10YR 3/2) organic coatings in pores; common faint dark brown (10YR 3/3) clay films on faces of peds; strongly acid; clear smooth boundary.

Bt3—40 to 52 inches; dark yellowish brown (10YR 4/4) silt loam; moderate medium subangular blocky structure; friable; few distinct dark brown (10YR 3/3) clay films on faces of peds; strongly acid; clear smooth boundary.

BC—52 to 56 inches; dark yellowish brown (10YR 4/4), stratified loam, silt loam, and sandy loam; weak fine subangular blocky structure; friable; medium acid; clear smooth boundary.

2C—56 to 64 inches; dark yellowish brown (10YR 4/4) fine sandy loam; massive; friable; neutral.

The thickness of the solum ranges from 47 to 70 inches. The thickness of the loess ranges from 40 to 60 inches. The mollic epipedon is 10 to 18 inches in thickness.

The A horizon has value of 2 or 3 and chroma of 1 to 3. The Bt horizon has value of 4 or 5 and chroma of 3 or 4. The 2C horizon is fine sandy loam, loam, or silt loam.

Proctor Series

The Proctor series consists of well drained and moderately well drained, moderately permeable soils on outwash plains and stream terraces. These soils formed in loess and in the underlying outwash. Slope ranges from 0 to 8 percent.

Proctor soils are similar to Catlin, Dana, Plano, and Saybrook soils and commonly are adjacent to Brenton, Drummer, and Elburn soils. The somewhat poorly drained Brenton and Elburn soils and the poorly drained Drummer soils are lower on the landscape than the Proctor soils. The moderately well drained Catlin, Dana, and Saybrook soils formed in loess and in the underlying silty or loamy till. Plano soils formed in a thicker layer of loess than the Proctor soils and in the underlying outwash.

Typical pedon of Proctor silt loam, 2 to 5 percent slopes, 1,100 feet north and 250 feet east of the southwest corner of sec. 34, T. 20 N., R. 13 W.

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

A—8 to 12 inches; very dark grayish brown (10YR 3/2) and dark brown (10YR 3/3) silt loam, grayish brown (10YR 5/2) dry; moderate medium granular structure; friable; slightly acid; clear smooth boundary.

Bt1—12 to 25 inches; brown (10YR 4/3) silty clay loam; moderate medium subangular blocky structure; firm; few faint dark brown (10YR 3/3) clay films on faces of peds; few fine prominent yellowish brown (10YR 5/8) accumulations of iron and manganese oxides; medium acid; clear wavy boundary.

Bt2—25 to 30 inches; brown (10YR 4/3) silty clay loam; 15 percent sand; moderate medium subangular blocky structure; firm; few faint dark brown (10YR 3/3) clay films on faces of peds; medium acid; clear smooth boundary.

2Bt3—30 to 38 inches; brown (10YR 4/3) loam; few fine distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; firm; few faint dark brown (10YR 3/3) clay films on faces of peds; medium acid; clear smooth boundary.

2BC—38 to 47 inches; dark yellowish brown (10YR 4/4) sandy loam; few fine faint grayish brown (10YR 5/2) mottles; weak medium subangular blocky structure; friable; few faint dark brown (10YR 3/3) clay films on faces of peds; medium acid; clear smooth boundary.

2C—47 to 60 inches; yellowish brown (10YR 5/4) and brown (10YR 4/3), stratified sandy loam and loam; massive; friable; few fine black (N 2/0) and yellowish red (5YR 5/8) concretions and accumulations of iron and manganese oxides; medium acid.

The thickness of the solum ranges from 40 to 60 inches. The thickness of the loess ranges from 20 to 40 inches. The surface soil is 8 to 16 inches in thickness.

The A horizon has value of 2 or 3 and chroma of 1 to 3. The Bt horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6. The 2Bt horizon is clay loam, sand clay loam, sandy loam, loam, or silty clay loam. The 2C horizon has hue of 10YR, 7.5YR, or 2.5Y, value of 4 to 6, and chroma of 2 to 6. It is stratified sandy loam, loam, loamy sand, sand, or silt loam.

Proctor silt loam, 5 to 8 percent slopes, eroded, has a thinner dark surface layer and more sand in the subsoil than are definitive for the series. These differences, however, do not significantly affect the use or behavior of the soil. This soil is classified as fine-silty, mixed, mesic Mollic Hapludalfs.

Raddle Series

The Raddle series consists of well drained, moderately permeable soils on foot slopes and stream terraces. These soils formed in silty alluvium. Slope ranges from 0 to 2 percent.

Raddle soils are similar to Rossburg soils and commonly are adjacent to Landes, Marseilles, and Strawn soils. Landes soils formed in loamy and sandy alluvium. Marseilles and Strawn soils are on very steep uplands above the Raddle soils. Rossburg soils formed in loamy alluvium.

Typical pedon of Raddle silt loam, 550 feet east and 2,000 feet north of the southwest corner of sec. 15, T. 19 N., R. 12 W.

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

A—8 to 14 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; mildly alkaline; clear smooth boundary.

Bw1—14 to 30 inches; dark brown (10YR 4/3) silt loam; moderate very fine subangular blocky structure; friable; many faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; mildly alkaline; diffuse smooth boundary.

Bw2—30 to 58 inches; dark yellowish brown (10YR 4/4) silt loam; moderate fine subangular blocky structure; friable; many faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; mildly alkaline; diffuse smooth boundary.

Bw3—58 to 77 inches; dark yellowish brown (10YR 4/4) silt loam; few fine faint brown (10YR 5/3) mottles; moderate medium subangular blocky structure; friable; common faint dark brown (10YR 4/3) organic coatings on faces of peds and lining pores; mildly alkaline.

The thickness of the solum ranges from 60 to more than 80 inches. The mollic epipedon is 10 to 18 inches in thickness.

The A horizon has value of 2 or 3 and chroma of 1 to 3. The Bw horizon has value of 4 or 5 and chroma of 3 or 4.

Rantoul Series

The Rantoul series consists of very poorly drained, very slowly permeable soils on uplands. These soils formed in clayey sediments. Slope ranges from 0 to 2 percent.

Rantoul soils are similar to Peotone and Rowe soils and commonly are adjacent to Bryce, Clarence, Rowe, and Swygert soils. The poorly drained Bryce and Rowe soils and the somewhat poorly drained Clarence and Swygert soils are higher on the landscape than the Rantoul soils. Peotone soils formed in silty sediments.

Typical pedon of Rantoul silty clay, 2,000 feet north and 410 feet east of the southwest corner of sec. 27, T. 23 N., R. 14 W.

Ap—0 to 7 inches; black (N 2/0) silty clay, very dark gray (N 3/0) dry; moderate medium granular structure; firm; neutral; abrupt smooth boundary.

A—7 to 16 inches; black (N 2/0) silty clay, very dark gray (N 2/0) dry; moderate fine angular blocky structure; firm; neutral; clear smooth boundary.

Bg1—16 to 27 inches; black (N 2/0) silty clay, very dark gray (N 3/0) dry; few fine prominent yellowish brown (10YR 5/6) and olive (5Y 4/3) mottles; strong medium prismatic structure parting to strong medium angular blocky; common pressure faces; firm; neutral; clear smooth boundary.

Bg2—27 to 33 inches; black (N 2/0) silty clay, very dark gray (N 3/0) dry; common medium prominent yellowish brown (10YR 5/6) and olive (5Y 4/3) mottles; strong medium prismatic structure parting to strong medium angular blocky; common pressure faces and slickensides; firm; neutral; clear smooth boundary.

Bg3—33 to 42 inches; dark gray (5Y 4/1) silty clay; common medium prominent light olive brown (2.5Y 5/6) mottles; strong medium prismatic structure parting to strong medium angular blocky; firm; common distinct very dark gray (N 3/0) organic coatings on faces of peds; neutral; clear smooth boundary.

Bg4—42 to 49 inches; gray (5Y 5/1) silty clay; many medium prominent light olive brown (2.5Y 5/6) mottles; moderate coarse prismatic structure parting to strong medium angular blocky; very firm; common distinct very dark gray (N 3/0) organic coatings on faces of peds; neutral; clear smooth boundary.

BCg—49 to 60 inches; dark gray (5Y 4/1) silty clay; weak coarse prismatic structure; very firm; common distinct very dark gray (N 3/0) organic coatings on faces of peds; neutral.

The thickness of the solum ranges from 40 to 65 inches. The mollic epipedon is 24 to 36 inches in thickness.

The A horizon has hue of 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 or 1. The Bg horizon has hue of 5Y or 2.5Y or is neutral in hue. It has value of 2 to 5 and chroma of 0 to 2. The content of clay ranges from 45 to 60 percent in the control section.

Raub Series

The Raub series consists of somewhat poorly drained, moderately slowly permeable soils on till plains and moraines. These soils formed in loess and in the underlying loamy till. Slope ranges from 0 to 2 percent.

Raub soils are similar to Brenton, Elburn, and Lisbon soils and commonly are adjacent to Dana and Drummer soils. Brenton soils formed in loess and in the underlying outwash. The moderately well drained Dana soils are higher on the landscape than the Raub soils. The poorly drained Drummer soils are lower on the landscape than the Raub soils. Elburn soils formed in a thicker layer of loess than the Raub soils and in the underlying outwash. Lisbon soils have a thinner solum than the Raub soils.

Typical pedon of Raub silt loam, 200 feet east and 220 feet north of the southwest corner of sec. 26, T. 17 N., R. 11 W.

Ap—0 to 8 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; weak fine granular structure; friable; slightly acid; clear smooth boundary.

A—8 to 12 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; moderate fine granular structure; friable; slightly acid; clear smooth boundary.

Bt1—12 to 20 inches; dark brown (10YR 4/3) silty clay loam; few fine faint dark grayish brown (10YR 4/2) and common fine faint yellowish brown (10YR 5/4) mottles; moderate very fine subangular blocky structure; firm; few faint dark brown (10YR 3/3) clay films on faces of peds; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds; slightly acid; clear smooth boundary.

Bt2—20 to 30 inches; yellowish brown (10YR 5/4) silty clay loam; common fine distinct grayish brown (10YR 5/2) and common medium distinct yellowish brown (10YR 5/6) mottles; moderate fine subangular blocky structure; firm; common faint dark brown (10YR 4/3) clay films on faces of peds; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; slightly acid; clear smooth boundary.

2Bt3—30 to 39 inches; yellowish brown (10YR 5/6) clay loam; common medium distinct yellowish brown (10YR 5/4) and common medium distinct grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure; firm; common distinct dark brown (10YR 4/3) clay films on faces of peds; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; neutral; clear smooth boundary.

2BC—39 to 48 inches; yellowish brown (10YR 5/4) clay loam; common medium distinct dark grayish brown (10YR 4/2) and common fine distinct yellowish brown (10YR 5/6) mottles; weak coarse subangular blocky structure; firm; neutral; clear smooth boundary.

2C—48 to 60 inches; yellowish brown (10YR 5/4) loam; many medium distinct dark grayish brown (10YR 4/2) and common fine distinct yellowish brown (10YR 5/6) mottles; massive; firm; slight effervescence; mildly alkaline.

The thickness of the solum ranges from 45 to 60 inches. The thickness of the loess ranges from 30 to 40 inches. The mollic epipedon is 10 to 18 inches in thickness.

The A horizon has value of 2 or 3 and chroma of 1 or 2. The Bt and 2Bt horizons have value of 4 or 5 and chroma of 2 to 6.

Rossburg Series

The Rossburg series consists of well drained, moderately permeable soils on flood plains. These soils formed in loamy alluvium. Slope ranges from 0 to 2 percent.

Rossburg soils are similar to Landes, Raddle, and Shaffton soils and commonly are adjacent to Morley, Shaffton, and Strawn soils. Landes soils formed in loamy and sandy alluvium. Morley and Strawn soils are on uplands above the Rossburg soils. Raddle soils formed in silty alluvium. The somewhat poorly drained Shaffton soils are lower on the landscape than the Rossburg soils.

Typical pedon of Rossburg loam, 1,600 feet east and 1,800 feet north of the southwest corner of sec. 26, T. 19 N., R. 11 W.

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

A—7 to 11 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; weak fine subangular blocky structure parting to moderate very fine granular; friable; 1 percent fine gravel; neutral; clear smooth boundary.

Bw1—11 to 23 inches; brown (10YR 4/3) loam; moderate fine subangular blocky structure; friable; many faint dark brown (10YR 3/3) organic coatings on faces of peds; 1 percent fine gravel; neutral; gradual smooth boundary.

Bw2—23 to 39 inches; brown (10YR 4/3) loam; moderate medium subangular blocky structure; friable; common faint dark brown (10YR 3/3) organic coatings on faces of peds; 1 percent fine gravel; neutral; diffuse smooth boundary.

Bw3—39 to 55 inches; brown (10YR 4/3) loam; moderate medium subangular blocky structure; friable; few faint dark brown (10YR 3/3) organic coatings on faces of peds; 1 percent fine gravel; neutral; diffuse smooth boundary.

C—55 to 60 inches; brown (10YR 4/3), stratified loam and silt loam; massive; friable; 1 percent fine gravel; mildly alkaline.

The thickness of the solum ranges from 45 to 60 inches. The mollic epipedon is 10 to 14 inches in thickness.

The A horizon has value and chroma of 2 or 3. The Bw horizon has value of 4 or 5 and chroma of 2 to 4. It is loam or silt loam. The C horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6. It is stratified loam, silt loam, or sandy loam.

Rowe Series

The Rowe series consists of poorly drained, very slowly permeable soils on till plains and moraines. These soils formed in clayey sediments and in the underlying clayey till. Slope ranges from 0 to 2 percent.

Rowe soils are similar to Bryce and Rantoul soils and commonly are adjacent to Clarence soils. Bryce soils do not have an argillic horizon. The somewhat poorly drained Clarence soils are higher on the landscape than the Rowe soils. Rantoul soils are very poorly drained and are in depressions.

Typical pedon of Rowe silty clay, 2,560 feet south and 840 feet west of the northeast corner of sec. 15, T. 23 N., R. 14 W.

Ap—0 to 8 inches; black (10YR 2/1) silty clay, dark gray (10YR 4/1) dry; moderate fine subangular blocky structure; firm; few fine and medium roots; neutral; clear smooth boundary.

A—8 to 14 inches; very dark gray (10YR 3/1) silty clay, gray (10YR 5/1) dry; few fine faint dark grayish brown (10YR 4/2) and few fine prominent yellowish brown (10YR 5/6) mottles; moderate fine subangular blocky structure; firm; few fine and medium roots; neutral; clear smooth boundary.

2Bt1—14 to 24 inches; dark grayish brown (2.5Y 4/2) silty clay; common fine prominent yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; very firm; few fine roots; common distinct dark gray (10YR 4/1) clay films on faces of peds; black (N 2/0) krotovinas; few coarse irregular concretions of calcium carbonate; neutral; clear smooth boundary.

2Bt2—24 to 33 inches; olive gray (5Y 4/2) silty clay; common fine distinct olive (5Y 5/6) mottles; moderate medium angular blocky structure; very firm; few fine roots; common distinct dark gray (5Y 4/1) clay films on faces of peds; few distinct very dark gray (10YR 3/1) organic coatings in root channels; few fine rounded accumulations of iron and manganese oxides; few coarse irregular concretions of calcium carbonate; slight effervescence; mildly alkaline; clear smooth boundary.

2Bt3—33 to 39 inches; gray (5Y 5/1) silty clay; many coarse prominent yellowish brown (10YR 5/6) mottles; moderate medium angular blocky structure; very firm; few fine roots; common distinct dark gray (5Y 4/1) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxides; slight effervescence; mildly alkaline; clear smooth boundary.

2BC—39 to 44 inches; olive gray (5Y 5/2) silty clay; common medium prominent yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure; very firm; few faint dark gray (5Y 4/1) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxides; strong effervescence; mildly alkaline; clear smooth boundary.

2C—44 to 60 inches; gray (5Y 5/1) silty clay; many coarse prominent yellowish brown (10YR 5/6) mottles; massive; very firm; common fine irregular light gray (10YR 7/1) accumulations of calcium carbonate; violent effervescence; moderately alkaline.

The thickness of the solum ranges from 40 to 60 inches. The mollic epipedon is 10 to 24 inches in thickness.

The A horizon has hue of 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2. The 2Bt horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, and chroma of 1 to 3. It is silty clay or clay. The content of clay ranges from 50 to 55 percent in the control section. The 2C horizon is silty clay or clay.

Sabina Series

The Sabina series consists of somewhat poorly drained, moderately slowly permeable soils on till plains. These soils formed in loess and in the underlying loamy till. Slope ranges from 0 to 2 percent.

Sabina soils are similar to Blount and Keomah soils and commonly are adjacent to Drummer and Xenia soils. Blount soils formed in silty material and in the underlying silty till. The poorly drained Drummer soils are lower on the landscape than the Sabina soils. Keomah soils formed entirely in loess. The moderately well drained Xenia soils are higher on the landscape than the Sabina soils.

Typical pedon of Sabina silt loam, 280 feet east and 70 feet south of the northwest corner of sec. 29, T. 19 N., R. 12 W.

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

E—8 to 13 inches; grayish brown (10YR 5/2) silt loam, light gray (10YR 7/2) dry; common fine distinct yellowish brown (10YR 5/4) mottles; weak medium platy structure; friable; medium acid; clear smooth boundary.

Bt1—13 to 20 inches; brown (10YR 4/3) silty clay loam; many fine distinct grayish brown (10YR 5/2) and common fine distinct yellowish brown (10YR 5/4) mottles; moderate very fine subangular blocky structure; firm; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common fine irregular accumulations of iron and manganese oxides; medium acid; gradual smooth boundary.

Bt2—20 to 30 inches; brown (10YR 4/3) silty clay loam; many medium distinct grayish brown (10YR 5/2) and common fine distinct yellowish brown (10YR 5/6) mottles; moderate fine subangular blocky structure; firm; many distinct dark gray (10YR 4/1) clay films on faces of peds; many fine irregular accumulations of iron and manganese oxides; medium acid; gradual smooth boundary.

Bt3—30 to 39 inches; yellowish brown (10YR 5/4) silty clay loam; many medium distinct grayish brown (10YR 5/2) and common medium faint yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; friable; many distinct dark gray (10YR 4/1) clay films on faces of peds; few prominent very dark gray (10YR 3/1) organic coatings lining pores; many fine irregular accumulations of iron and manganese oxides; slightly acid; diffuse smooth boundary.

Bt4—39 to 50 inches; yellowish brown (10YR 5/4) silty clay loam; many medium distinct grayish brown (10YR 5/2) and many medium faint yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; friable; common distinct dark gray (10YR 4/1) clay films on faces of peds; few moderately thick very dark gray (10YR 3/1) organic coatings lining pores; common fine irregular accumulations of iron and manganese oxides; neutral; clear smooth boundary.

2BC—50 to 58 inches; light olive brown (2.5Y 5/4) loam; common medium prominent light gray (2.5Y 6/1) and common fine prominent yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; firm; few prominent dark gray (10YR 4/1) clay films on faces of peds; few prominent very dark gray (10YR 3/1) organic coatings lining pores; few fine irregular accumulations of iron and manganese oxides; 5 percent fine and medium gravel; very slight effervescence; mildly alkaline; gradual smooth boundary.

2C—58 to 60 inches; light olive brown (2.5Y 5/4) loam; many medium prominent light gray (2.5Y 6/1) and common medium distinct yellowish brown (10YR 5/6) mottles; massive; firm; very few distinct very dark grayish brown (10YR 3/2) organic coatings lining pores; few fine irregular accumulations of iron and manganese oxides; 5 percent fine and medium gravel; slight effervescence; mildly alkaline.

The thickness of the solum ranges from 44 to 60 inches. The thickness of the loess ranges from 40 to 60 inches. The surface soil is 10 to 16 inches in thickness.

The A horizon has value of 4 or 5. The Bt horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 to 4. The content of clay ranges from 35 to 42 percent in the control section. The 2BC or 2C horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 to 4. It is clay loam or loam.

Sable Series

The Sable series consists of poorly drained, moderately permeable soils on till plains and outwash plains. These soils formed in loess. Slope ranges from 0 to 2 percent.

Sable soils are similar to Drummer and Pella soils and commonly are adjacent to Ipava soils. Drummer and Pella soils formed in loess or silty material and in the underlying outwash. The somewhat poorly drained Ipava soils are higher on the landscape than the Sable soils. Pella soils have carbonates within a depth of 40 inches.

Typical pedon of Sable silty clay loam, 1,600 feet south and 200 feet west of the northeast corner of sec. 13, T. 19 N., R. 11 W.

Ap—0 to 9 inches; black (N 2/0) silty clay loam, dark gray (N 4/0) dry; moderate medium granular structure; friable; slightly acid; abrupt smooth boundary.

A—9 to 14 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine subangular blocky structure; friable; neutral; clear smooth boundary.

BA—14 to 22 inches; dark gray (10YR 4/1) silty clay loam; few fine faint grayish brown (10YR 5/2) mottles; moderate medium angular blocky structure; firm; many faint very dark gray (10YR 3/1) organic coatings on faces of peds; few fine rounded black (N 2/0) concretions of iron and manganese oxides; neutral; clear smooth boundary.

Bg1—22 to 30 inches; gray (10YR 5/1) silty clay loam; common fine prominent dark yellowish brown (10YR 4/6) mottles; strong medium angular blocky structure; firm; common faint very dark gray (10YR 3/1) organic coatings on faces of peds; few fine rounded black (N 2/0) concretions of iron and manganese oxides; neutral; clear smooth boundary.

Bg2—30 to 48 inches; gray (10YR 5/1) silty clay loam; many medium prominent yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; firm; few faint very dark gray (10YR 3/1) organic coatings on faces of peds; few fine rounded black (N 2/0) concretions of iron and manganese oxides; large very dark gray (10YR 3/1) krotovina; mildly alkaline; clear smooth boundary.

Cg—48 to 70 inches; light olive gray (5Y 6/2) silt loam; many coarse prominent yellowish brown (10YR 5/8) and common medium prominent light olive brown (2.5Y 5/4) mottles; firm; few medium rounded white (10YR 8/1) accumulations of calcium carbonate; few fine rounded black (N 2/0) concretions of iron and manganese oxides; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 40 to 60 inches. The mollic epipedon is 12 to 18 inches in thickness.

The A horizon has hue of 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 or 1. The Bg horizon has hue of 10YR, 2.5Y, or 5Y or is neutral in hue. It has value of 4 to 6 and chroma of 0 to 2.

Sawmill Series

The Sawmill series consists of poorly drained, moderately permeable soils on flood plains. These soils formed in silty alluvium. Slope ranges from 0 to 2 percent.

Sawmill soils are similar to Ambraw soils and commonly are adjacent to Morley, Shaffton, and Strawn soils. Ambraw soils formed in loamy alluvium. The well drained Morley and Strawn soils are on uplands above the Sawmill soils. The somewhat poorly drained Shaffton soils are higher on the flood plains than the Sawmill soils.

Typical pedon of Sawmill silty clay loam, 120 feet east and 500 feet south of the northwest corner of sec. 32, T. 19 N., R. 13 W.

Ap—0 to 8 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine granular structure; friable; neutral; abrupt smooth boundary.

A1—8 to 16 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; many fine faint very dark gray (10YR 3/1) and few fine distinct dark grayish brown (2.5Y 4/1) mottles; moderate very fine subangular blocky structure; firm; few fine irregular accumulations of iron and manganese oxides; neutral; gradual smooth boundary.

A2—16 to 26 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; common fine distinct grayish brown (2.5Y 5/2) and few fine faint very dark gray (10YR 3/1) mottles; weak fine prismatic structure parting to moderate very fine subangular blocky; firm; common fine irregular accumulations of iron and manganese oxides; neutral; clear smooth boundary.

BA—26 to 33 inches; dark gray (10YR 4/1) silty clay loam; few fine distinct light olive brown (2.5Y 5/4) mottles; weak prismatic structure parting to moderate fine subangular blocky; firm; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds; common fine irregular accumulations of iron and manganese oxides; neutral; clear smooth boundary.

Bg—33 to 45 inches; grayish brown (2.5Y 5/2) silty clay loam; common fine distinct light olive brown (2.5Y 5/4) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; firm; few distinct very dark gray (10YR 3/1) organic coatings on faces of peds; common distinct dark gray (10YR 4/1) coatings on faces of peds; common fine irregular accumulations of iron and manganese oxides; neutral; gradual smooth boundary.

BCg—45 to 55 inches; light brownish gray (2.5Y 6/2), stratified silty clay loam and silt loam; common fine prominent yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; few distinct very dark gray (10YR 3/1) organic coatings lining pores; common distinct dark gray (10YR 4/1) coatings on faces of peds; common medium irregular accumulations of iron and manganese oxides; neutral; diffuse smooth boundary.

Cg—55 to 62 inches; light brownish gray (2.5Y 6/2), stratified silty clay loam and silt loam; many medium prominent yellowish brown (10YR 5/6) mottles; massive; friable; common medium irregular accumulations of iron and manganese oxides; neutral.

The thickness of the solum ranges from 44 to 60 inches. The mollic epipedon is 24 to 36 inches in thickness.

The A horizon has hue of 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2. The Bg horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2. The Cg horizon is stratified silty clay loam, silt loam, sandy loam, or loam.

Saybrook Series

The Saybrook series consists of moderately well drained, moderately permeable soils on till plains and moraines. These soils formed in loess or silty material and in the underlying silty or loamy till. Slope ranges from 2 to 6 percent.

The Saybrook soils in this county have a thinner dark surface layer than is defined as the range for the series. This difference, however, does not significantly affect the use or behavior of the soils. These soils are classified as fine-silty, mixed, mesic Mollic Hapludalfs.

Saybrook soils are similar to Catlin, Dana, Plano, and Proctor soils and commonly are adjacent to Lisbon, Odell, and Drummer soils. Catlin and Dana soils have a thicker solum than the Saybrook soils. The poorly drained Drummer soils and the somewhat poorly drained Lisbon and Odell soils are lower on the landscape than the Saybrook soils. Plano and Proctor soils formed in loess and in the underlying outwash. Plano soils are well drained. Proctor soils are well drained and moderately well drained.

Typical pedon of Saybrook silt loam, 2 to 5 percent slopes, eroded, 880 feet east and 560 feet south of the northwest corner of sec. 6, T. 23 N., R. 10 W.

Ap—0 to 9 inches; very dark gray (10YR 3/1) silt loam, grayish brown (10YR 5/2) dry; mixed with common dark brown (10YR 4/3) fragments of subsoil material; weak fine granular structure; friable;

slightly acid; abrupt smooth boundary.

BA—9 to 13 inches; dark brown (10YR 4/3) silt loam; moderate very fine subangular blocky structure; friable; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds; medium acid; clear smooth boundary.

Bt1—13 to 22 inches; dark yellowish brown (10YR 4/4) silty clay loam; few fine distinct grayish brown (10YR 5/2) and few fine distinct yellowish brown (10YR 5/6) mottles in the lower 3 inches; moderate fine subangular blocky structure; friable; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; many faint dark brown (10YR 4/3) clay films on faces of peds; slightly acid; clear smooth boundary.

2Bt2—22 to 29 inches; light olive brown (2.5Y 5/4) clay loam; common fine distinct grayish brown (10YR 5/2) and few fine distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; friable; few distinct very dark grayish brown (10YR 3/2) organic coatings lining pores; many distinct dark brown (10YR 4/3) clay films on faces of peds; 5 percent fine gravel; neutral; clear smooth boundary.

2BC—29 to 36 inches; light olive brown (2.5Y 5/4) loam; few fine distinct grayish brown (2.5Y 5/2) and few fine distinct yellowish brown (10YR 5/6) mottles; weak coarse subangular blocky structure; firm; few distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; 5 percent fine gravel; slight effervescence; mildly alkaline; gradual smooth boundary.

2C—36 to 60 inches; light olive brown (2.5Y 5/4) loam; few fine distinct gray (2.5Y 6/1) and few fine prominent yellowish brown (10YR 5/6) mottles; weak coarse and very coarse prismatic structure; firm; few distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; 5 percent fine gravel; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 30 to 40 inches. The thickness of the loess ranges from 20 to 40 inches. The surface layer is 6 to 10 inches in thickness.

The Ap horizon has value of 2 or 3 and chroma of 1 to 3. The Bt horizon has value of 4 or 5. The 2Bt horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 3 or 4. It is clay loam or loam. The 2C horizon has hue of 10YR, 2.5Y, or 7.5YR, value of 4 to 6, and chroma of 3 or 4. It is loam or silty clay loam.

Selma Series

The Selma series consists of poorly drained, moderately permeable soils on outwash plains. These soils formed in loamy outwash. Slope ranges from 0 to 2 percent.

Selma soils are similar to Ambraw and Drummer soils and commonly are adjacent to Andres, Ashkum, Jasper, and La Hogue soils. Ambraw soils formed in loamy alluvium. The somewhat poorly drained Andres and La Hogue soils are higher on the landscape than the Selma soils. Ashkum soils formed in silty sediments and in the underlying silty till. Drummer soils formed in loess or silty material and in the underlying outwash. The well drained Jasper soils are higher on the landscape than the Selma soils.

Typical pedon of Selma silt loam, 500 feet south and 200 feet west of the northeast corner of sec. 28, T. 22 N., R. 12 W.

Ap—0 to 9 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; moderate medium granular structure; friable; neutral; abrupt smooth boundary.

A—9 to 22 inches; black (10YR 2/1) loam, dark gray (10YR 4/1) dry; weak fine granular structure; friable; neutral; clear smooth boundary.

BAg—22 to 27 inches; dark gray (5Y 5/1) loam; weak fine subangular blocky structure; friable; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; neutral; clear smooth boundary.

Bg1—27 to 31 inches; olive gray (5Y 4/2) loam; common medium prominent yellowish brown (10YR 5/6) and common medium faint grayish brown (2.5Y 5/2) mottles; weak fine subangular blocky structure; friable; few distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few fine yellowish brown (10YR 5/8) accumulations of iron and manganese oxides; few pebbles; neutral; clear smooth boundary.

Bg2—31 to 39 inches; light gray (5Y 6/1) clay loam; common medium prominent yellowish brown (10YR 5/6) and common fine faint grayish brown (2.5Y 5/2) mottles; moderate medium subangular blocky structure; friable; common pebbles; few fine yellowish brown (10YR 5/8) accumulations of iron and manganese oxides; neutral; clear smooth boundary.

BCg—39 to 43 inches; light gray (5Y 6/1) loam; common medium prominent yellowish brown (10YR 5/6) and common fine faint gray (2.5Y 5/1) mottles; weak medium subangular blocky structure; friable; common pebbles; few fine yellowish brown (10YR 5/8) accumulations of iron and manganese oxides; neutral; clear smooth boundary.

Cg—43 to 60 inches; light gray (5Y 6/1) sandy loam; common medium distinct yellowish brown (10YR 5/6) mottles; massive; friable; common pebbles; common medium yellowish brown (10YR 5/8) accumulations of iron and manganese oxides; mildly alkaline.

The thickness of the solum ranges from 40 to 55 inches. The mollic epipedon is 10 to 22 inches in thickness.

The A horizon has value of 2 or 3 and chroma of 1 or 2. The Bg horizon has hue of 2.5Y or 5Y, value of 4 to 6, and chroma of 1 or 2. It is loam or clay loam. The Cg horizon is sandy loam or stratified sand, loamy sand, sandy loam, loam, or silt loam.

Shaffton Series

The Shaffton series consists of somewhat poorly drained, moderately permeable soils on flood plains. These soils formed in loamy alluvium. Slope ranges from 0 to 2 percent.

Shaffton soils are similar to Rossburg soils and commonly are adjacent to Ambraw, Landes, and Sawmill soils. The poorly drained Ambraw soils are on uplands. The poorly drained Sawmill soils are lower on the landscape than the Shaffton soils. The well drained Landes and Rossburg soils are higher on the landscape than the Shaffton soils.

Typical pedon of Shaffton loam, 2,360 feet west and 50 feet south of the northeast corner of sec. 29, T. 22 N., R. 11 W.

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

A—9 to 13 inches; black (10YR 2/1) loam, dark gray (10YR 4/1) dry; moderate fine subangular blocky structure; friable; neutral; clear smooth boundary.

Bw1—13 to 19 inches; brown (10YR 5/3) loam; common fine distinct yellowish brown (10YR 5/6) and common medium faint dark grayish brown (10YR 4/2) mottles; moderate fine subangular blocky structure; friable; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; neutral; clear smooth boundary.

Bw2—19 to 32 inches; mottled loam, 60 percent grayish brown (10YR 5/2) and 40 percent brown (10YR 5/3); common medium distinct yellowish brown (10YR 5/6) mottles; moderate fine subangular blocky structure; friable; few coarse rounded accumulations of iron and manganese oxides; neutral; clear smooth boundary.

Bw3—32 to 44 inches; grayish brown (10YR 5/2) loam; common medium distinct yellowish brown (10YR 5/6) and common medium faint brown (10YR 5/3) mottles; weak medium subangular blocky structure; friable; few coarse rounded accumulations of iron and manganese oxides; neutral; clear smooth boundary.

C—44 to 60 inches; grayish brown (10YR 5/2), stratified loam, sandy loam, and loamy sand; common medium distinct yellowish brown (10YR 5/6) mottles; massive; friable; 6 percent fine and medium gravel; neutral.

The thickness of the solum ranges from 35 to 48 inches. The mollic epipedon is 10 to 15 inches in thickness.

The A horizon has value of 2 or 3 and chroma of 1 or 2. The Bw horizon has value of 4 or 5 and chroma of 2 or 3. The 2C horizon is stratified loam, sandy loam, loamy sand, or sand.

Sparta Series

The Sparta series consists of excessively drained, rapidly permeable soils on uplands. These soils formed in sandy eolian material. Slope ranges from 1 to 6 percent.

Sparta soils are similar to Onarga soils and commonly are adjacent to Andres and La Hogue soils. The somewhat poorly drained Andres and La Hogue soils are lower on the landscape than the Sparta soils. The well drained Onarga soils contain more clay than the Sparta soils.

Typical pedon of Sparta loamy fine sand, 1 to 6 percent slopes, 600 feet south and 320 feet west of the northeast corner of sec. 17, T. 22 N., R. 11 W.

Ap—0 to 11 inches; very dark grayish brown (10YR 3/2) loamy fine sand, grayish brown (10YR 5/2) dry; weak fine granular structure; very friable; medium acid; abrupt smooth boundary.

Bw1—11 to 18 inches; brown (10YR 4/3) loamy fine sand; weak medium subangular blocky structure; very friable; common faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; strongly acid; clear smooth boundary.

Bw2—18 to 30 inches; dark yellowish brown (10YR 4/4) fine sand; weak medium subangular blocky structure; very friable; medium acid; clear smooth boundary.

BC—30 to 37 inches; yellowish brown (10YR 5/6) fine sand; weak coarse subangular blocky structure; very friable; medium acid; clear smooth boundary.

C—37 to 60 inches; yellowish brown (10YR 5/4) fine sand; single grain; loose; medium acid.

The thickness of the solum ranges from 24 to 40 inches. The mollic epipedon is 10 to 15 inches in thickness.

The Ap horizon has value of 2 or 3. The Bw and C horizons have value of 4 or 5 and chroma of 3 to 6.

Starks Series

The Starks series consists of somewhat poorly drained, moderately permeable soils on outwash plains and stream terraces. These soils formed in loess and in the underlying outwash. Slope ranges from 0 to 2 percent.

Starks soils are similar to Fincastle, Kendall, Whitaker, and Whitaker Variant soils and commonly are adjacent to Camden, Drummer, and Martinsville soils. The well drained Camden and Martinsville soils are higher on the landscape than the Starks soils. The poorly drained Drummer soils are lower on the landscape than the Starks soils. Fincastle soils formed in loess and in the underlying loamy till. Kendall soils formed in a thicker layer of loess than the Starks soils and in the underlying outwash. Whitaker soils formed entirely in loamy outwash. Whitaker Variant soils formed in loamy outwash and in the underlying silty till.

Typical pedon of Starks silt loam, 1,800 feet south and 2,340 feet east of the northwest corner of sec. 10, T. 19 N., R. 12 W.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam, gray (10YR 6/1) dry; weak very fine granular structure; friable; medium acid; abrupt smooth boundary.

E—7 to 12 inches; grayish brown (10YR 5/2) silt loam, light gray (10YR 7/1) dry; many fine faint brown (10YR 5/3) and few fine distinct yellowish brown (10YR 5/6) mottles; moderate thin platy structure; friable; many distinct gray (10YR 6/1) silt coatings on faces of peds; few fine rounded concretions of iron and manganese oxides; strongly acid; clear smooth boundary.

Bt1—12 to 18 inches; brown (10YR 5/3) silty clay loam; many fine distinct yellowish brown (10YR 5/6) and common fine faint grayish brown (10YR 5/2) mottles; moderate fine subangular blocky structure; friable; many distinct grayish brown (10YR 5/2) clay films on faces of peds; common fine rounded concretions of iron and manganese oxides; strongly acid; gradual smooth boundary.

Bt2—18 to 26 inches; brown (10YR 5/3) silty clay loam; many fine distinct yellowish brown (10YR 5/6) and many fine distinct gray (10YR 5/1) mottles; moderate medium subangular blocky structure; friable; many distinct grayish brown (10YR 5/2) clay films on faces of peds; common fine rounded concretions of iron and manganese oxides; strongly acid; clear smooth boundary.

2Bt3—26 to 37 inches; mottled clay loam, 60 percent grayish brown (10YR 5/2) and 40 percent yellowish brown (10YR 5/6); many fine faint brown (10YR 5/3) mottles; moderate medium subangular blocky structure; friable; common faint dark grayish brown (10YR 4/2) and common distinct very dark gray (10YR 3/1) clay films on faces of peds; many fine rounded concretions of iron and manganese oxides; 5 percent fine gravel; strongly acid; gradual smooth boundary.

2BC—37 to 47 inches; mottled 60 percent grayish brown (10YR 5/2) and 40 percent yellowish brown (10YR 5/6), stratified loam, clay loam, and silty clay loam; many fine faint brown (10YR 5/3) mottles; weak coarse subangular blocky structure; friable; few distinct dark gray (10YR 4/1) clay films on faces of peds; common fine rounded concretions of iron and manganese oxides; 5 percent fine gravel; neutral; diffuse smooth boundary.

2C—47 to 60 inches; yellowish brown (10YR 5/4), stratified silty clay loam, loamy sand, fine sandy loam, and sand; common fine yellowish brown (10YR 5/6) and common fine distinct grayish brown (10YR 5/2) mottles; massive; friable; 5 percent fine gravel; slight effervescence; mildly alkaline.

The thickness of the solum ranges from 40 to 55 inches. The thickness of the loess ranges from 24 to 40 inches. The surface soil is 8 to 18 inches thick.

The Ap horizon has value of 4 or 5 and chroma of 2 or 3. The Bt horizon has value of 4 to 6 and chroma of 2 to 4. The 2Bt horizon has value of 4 to 6 and chroma of 2 to 6. It is loam, silty clay loam, silt loam, or clay loam. The 2C horizon has value of 4 to 6 and chroma of 3 to 5.

Strawn Series

The Strawn series consists of well drained, moderately permeable soils on uplands. These soils formed in loamy till. Slope ranges from 35 to 75 percent.

Strawn soils are similar to Miami soils and commonly are adjacent to Landes, Sabina, and Xenia soils. Landes soils formed in loamy and sandy alluvium. They are on flood plains below the Strawn soils. Miami, Sabina, and Xenia soils are on the less sloping parts of the landscape. They have a thicker solum than the Strawn soils. Sabina soils are somewhat poorly drained. Xenia soils are moderately well drained.

Typical pedon of Strawn silt loam, 35 to 75 percent slopes, 1,100 feet east and 2,520 feet south of the northwest corner of sec. 24, T. 18 N., R. 11 W.

A—0 to 2 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; 2 percent fine gravel;

slightly acid; abrupt smooth boundary.

E—2 to 4 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; moderate medium platy structure; friable; few faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; 2 percent fine gravel; strongly acid; clear smooth boundary.

EB—4 to 7 inches; brown (10YR 4/3) silt loam; moderate very fine subangular blocky structure; friable; few faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; 2 percent fine gravel; medium acid; clear smooth boundary.

Bt—7 to 15 inches; brown (10YR 4/3) silt loam; 25 percent sand; moderate very fine subangular blocky structure; friable; few faint dark brown (10YR 3/3) clay films on faces of peds; few faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; 3 percent fine gravel; slightly acid; clear smooth boundary.

BC—15 to 18 inches; light olive brown (2.5Y 5/4) loam; weak medium subangular blocky structure; friable; 3 percent fine gravel; slight effervescence; neutral; clear smooth boundary.

C—18 to 60 inches; light olive brown (2.5Y 5/4) loam; massive; firm; 5 percent fine gravel; strong effervescence; mildly alkaline.

The thickness of the solum ranges from 16 to 24 inches. The depth to free carbonates ranges from 14 to 24 inches. The surface soil is 4 to 8 inches in thickness.

The A horizon has value of 3 to 5 and chroma of 2 to 4. The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. It is silt loam, silty clay loam, or clay loam. The C horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2 to 6.

Swygert Series

The Swygert series consists of somewhat poorly drained, very slowly permeable soils on till plains and moraines. These soils formed in silty material and in the underlying clayey till. Slope ranges from 0 to 7 percent.

Swygert soils are similar to Clarence and Elliott soils and commonly are adjacent to Bryce and Mokena soils. The poorly drained Bryce soils are lower on the landscape than the Swygert soils. Clarence soils contain more clay in the control section than the Swygert soils. They formed entirely in clayey till. Elliott soils formed in silty material and in the underlying silty till. Mokena soils formed in silty and loamy material and in the underlying clayey till.

Typical pedon of Swygert silty clay loam, 0 to 2 percent slopes, 300 feet north and 180 feet east of the southwest corner of sec. 27, T. 23 N., R. 14 W.

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

A—9 to 14 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; moderate fine subangular blocky structure; friable; many fine roots; slightly acid; clear smooth boundary.

2Bt1—14 to 23 inches; dark yellowish brown (10YR 4/4) silty clay; common fine distinct dark grayish brown (10YR 4/2) mottles; moderate medium prismatic structure; firm; few fine roots; common faint dark brown (10YR 4/3) clay films on faces of peds; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; neutral; clear smooth boundary.

2Bt2—23 to 34 inches; light olive brown (2.5Y 5/4) silty clay; common medium distinct grayish brown (2.5Y 5/2) and common medium prominent yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure; firm; few fine and coarse roots; few distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few fine black (10YR 2/1) concretions of iron and manganese oxides; few fine irregular concretions of calcium carbonate; slight effervescence; mildly alkaline; clear smooth boundary.

2Bt3—34 to 38 inches; grayish brown (2.5Y 5/2) silty clay; common medium distinct light olive brown (2.5Y 5/4), common medium distinct gray (10YR 5/1), and common medium prominent dark yellowish brown (10YR 4/6) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; firm; few fine roots; few distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine irregular concretions of calcium carbonate; slight effervescence; mildly alkaline; clear smooth boundary.

2BC—38 to 43 inches; grayish brown (2.5Y 5/2) silty clay; many coarse distinct gray (10YR 5/1), common medium prominent yellowish brown (10YR 5/6), common medium distinct light olive brown (2.5Y 5/4), and common medium distinct olive brown (2.5Y 4/4) mottles; weak medium prismatic structure; very firm; few fine roots; few faint dark grayish brown (10YR 4/2) clay films on faces of peds; common medium irregular concretions of calcium carbonate; strong effervescence; moderately alkaline; abrupt smooth boundary.

2C—43 to 60 inches; grayish brown (2.5Y 5/2) silty clay; many coarse distinct light olive brown (2.5Y 5/4), many medium distinct gray (10YR 5/1), common medium distinct light gray (10YR 6/1), and common medium prominent dark yellowish brown (10YR 4/6) mottles; massive; very firm; very few faint dark grayish brown (10YR 4/2) coatings on vertical cleavage planes; few medium irregular concretions of calcium carbonate; violent effervescence; moderately alkaline.

The thickness of the solum ranges from 35 to 55 inches. The depth to carbonates ranges from 18 to 50 inches. The surface soil is 7 to 16 inches in thickness.

The A horizon has value of 2 or 3 and chroma of 1 or 2. The 2Bt horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 or 5, and chroma of 2 to 6. It is silty clay or clay. The content of clay ranges from 45 to 50 percent in the control section. The 2C horizon has hue of 2.5Y or 5Y, value of 4 to 6, and chroma of 1 to 4. It is silty clay or clay.

Swygert silty clay loam, 2 to 5 percent slopes, eroded, and Swygert silty clay loam, 5 to 7 percent slopes, eroded, have a thinner dark surface layer than is defined as the range for the series. This difference, however, does not significantly affect the use or behavior of the soils. These soils are classified as fine, mixed, mesic Aquollic Hapludalfs.

Symerton Series

The Symerton series consists of moderately well drained, moderately slowly permeable soils on uplands. These soils formed in loamy outwash and in the underlying silty till. Slope ranges from 2 to 5 percent.

Symerton soils are similar to Corwin and Mona soils and commonly are adjacent to Andres, Ashkum, and Elliott soils. The somewhat poorly drained Andres and Elliott soils and the poorly drained Ashkum soils are lower on the landscape than the Symerton soils. Corwin soils formed entirely in loamy till. Mona soils formed in silty material and loamy outwash and in the underlying clayey till.

Typical pedon of Symerton loam, 2 to 5 percent slopes, 1,000 feet south and 500 feet west of the northeast corner of sec. 28, T. 22 N., R. 12 W.

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

A—7 to 13 inches; very dark gray (10YR 3/1) loam, grayish brown (10YR 5/2) dry; moderate very fine granular structure; friable; 2 percent fine gravel; medium acid; clear smooth boundary.

BA—13 to 18 inches; dark yellowish brown (10YR 4/4) loam; moderate very fine subangular blocky structure; friable; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds; 2 percent fine gravel; slightly acid; clear smooth boundary.

Bt1—18 to 26 inches; dark yellowish brown (10YR 4/4) clay loam; moderate fine subangular blocky structure; friable; many faint brown (10YR 4/3) clay films on faces of peds; 2 percent fine gravel; slightly acid; gradual smooth boundary.

Bt2—26 to 34 inches; dark yellowish brown (10YR 4/4) clay loam; 3-inch strata of sandy clay loam in the lower part; moderate medium subangular blocky structure; friable; common faint brown (10YR 4/3) clay films on faces of peds; 2 percent fine gravel; neutral; clear smooth boundary.

2BC—34 to 39 inches; light olive brown (2.5Y 5/4) silty clay loam; few fine distinct gray (N 6/0) and few fine distinct yellowish brown (10YR 5/4) mottles; weak medium subangular blocky structure; firm; 5 percent fine and medium gravel; very slight effervescence; neutral; clear smooth boundary.

2C—39 to 60 inches; light olive brown (2.5Y 5/4) silty clay loam; few fine distinct gray (N 6/0) and few fine faint yellowish brown (10YR 5/4) mottles; massive; firm; 5 percent fine and medium gravel; strong effervescence; mildly alkaline.

The thickness of the solum ranges from 30 to 50 inches. The mollic epipedon is 10 to 20 inches in thickness.

The A horizon has value of 2 or 3 and chroma of 1 to 3. The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6. It is clay loam, silty clay loam, or sandy clay loam. The 2C horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, and chroma of 3 or 4.

Varna Series

The Varna series consists of moderately well drained, slowly permeable or moderately slowly permeable soils on till plains and moraines. These soils formed in silty till. Slope ranges from 2 to 8 percent.

The Varna soils in this county have a thinner dark surface layer than is defined as the range for the series. This difference, however, does not significantly affect the use or behavior of the soils. These soils are classified as fine, illitic, mesic Mollic Hapludalfs.

Varna soils are similar to Morley soils and commonly are adjacent to Ashkum and Elliott soils. The poorly drained Ashkum and somewhat poorly drained Elliott soils are lower on the landscape than the Varna soils. Morley soils have a lighter colored surface layer than the Varna soils.

Typical pedon of Varna silt loam, 2 to 5 percent slopes, eroded, 2,280 feet north and 1,650 feet west of the southeast corner of sec. 16, T. 23 N., R. 12 W.

Ap—0 to 8 inches; very dark gray (10YR 3/1) silt loam, grayish brown (10YR 5/2) dry; mixed with common olive brown (2.5Y 4/4) fragments of subsoil material; moderate very fine granular structure; friable; 3 percent fine gravel; neutral; abrupt smooth boundary.

Bt1—8 to 16 inches; olive brown (2.5Y 4/4) silty clay loam; moderate very fine subangular blocky structure; friable; few prominent very dark gray (10YR 3/1) organic coatings and many faint dark brown (2.5Y 4/3) clay films on faces of peds; 3 percent fine gravel; neutral; clear smooth boundary.

Bt2—16 to 23 inches; olive brown (2.5Y 4/4) silty clay loam; few fine faint grayish brown (2.5Y 5/2) and few fine faint yellowish brown (10YR 5/6) mottles; moderate fine subangular blocky structure; friable; few prominent very dark gray (10YR 3/1) organic coatings and many faint dark brown (2.5Y 4/3) clay films on faces of peds; 3 percent fine gravel; neutral; gradual smooth boundary.

Bt3—23 to 33 inches; olive brown (2.5Y 4/4) silty clay loam; few fine distinct yellowish brown (10YR 5/6) and common fine distinct gray (2.5Y 5/1) mottles; moderate medium subangular blocky structure; friable; few distinct very dark grayish brown (10YR 3/2) organic coatings lining pores; many distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; 3 percent fine gravel; slight effervescence at a depth of 30 inches; neutral; gradual smooth boundary.

BC—33 to 38 inches; olive brown (2.5Y 4/4) silty clay loam; few fine distinct yellowish brown (10YR 5/6) and common fine distinct gray (2.5Y 5/1) mottles; weak medium subangular blocky structure; firm; few distinct very dark grayish brown (10YR 3/2) organic coatings lining pores; common distinct dark grayish brown (2.5Y 4/2) coatings on faces of peds; few fine rounded concretions of iron and manganese oxides; few fine irregular accumulations of calcium carbonate; 3 percent fine gravel; strong effervescence; mildly alkaline; clear smooth boundary.

C—38 to 60 inches; olive brown (2.5Y 4/4) silty clay loam; few fine distinct yellowish brown (10YR 5/6) and common fine distinct gray (2.5Y 5/1) mottles; massive; firm; very few distinct very dark grayish brown (10YR 3/2) organic coatings lining pores; few distinct dark grayish brown (2.5Y 3/2) coatings on vertical cleavage planes; few fine rounded concretions of iron and manganese oxides; few fine irregular accumulations of calcium carbonate; 3 percent fine gravel; violent effervescence; moderately alkaline.

The thickness of the solum ranges from 25 to 50 inches. The surface layer is 6 to 13 inches in thickness.

The Ap horizon has value of 2 or 3 and chroma of 1 or 2. The Bt horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, and chroma of 3 or 4. The content of clay ranges from 35 to 40 percent in the control section. The C horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, and chroma of 2 to 6.

Wea Series

The Wea series consists of well drained soils on outwash plains and stream terraces. These soils formed in loess and in the underlying loamy and gravelly sediments. Permeability is moderate in the solum and very rapid in the underlying material. Slope ranges from 0 to 2 percent.

Wea soils are similar to Jasper soils and commonly are adjacent to Jasper, La Hogue, Sawmill, and Selma soils. Jasper soils formed entirely in loamy outwash. The somewhat poorly drained La Hogue and poorly drained Selma soils are lower on the landscape than the Wea soils. The poorly drained Sawmill soils are on flood plains below the Wea soils.

Typical pedon of Wea silt loam, 2,060 feet south and 200 feet east of the northwest corner of sec. 22, T. 22 N., R. 14 W.

Ap—0 to 11 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; slightly acid; abrupt smooth boundary.

Bt1—11 to 16 inches; dark brown (10YR 4/3) silty clay loam; moderate very fine subangular blocky structure; friable; common faint dark brown (10YR 3/3) clay films on faces of peds; many faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; medium acid; clear smooth boundary.

2Bt2—16 to 32 inches; dark yellowish brown (10YR 4/4) clay loam; moderate fine subangular blocky structure; friable; common faint dark brown (10YR 3/3) clay coatings on faces of peds; common faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; 3 percent fine gravel; medium acid; clear smooth boundary.

2Bt3—32 to 54 inches; dark yellowish brown (10YR 4/4) clay loam; moderate medium subangular blocky structure; friable; common faint dark brown (10YR 3/3) clay films on faces of peds; 9 percent fine gravel; slightly acid; clear smooth boundary.

3C—54 to 64 inches; light yellowish brown (10YR 6/4), stratified sand and very gravelly sand; single grain; loose; 15 percent fine gravel; 35 percent medium and coarse gravel; 2 percent cobbles; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 45 to 65 inches. The mollic epipedon is 10 to 18 inches in thickness.

The A horizon has value of 2 or 3 and chroma of 1 or 2. The Bt horizon has value of 4 or 5 and chroma of 3 or 4. It is silt loam or silty clay loam. The 2Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. The 3C horizon is stratified sand, gravelly sand, or very gravelly sand.

Whitaker Series

The Whitaker series consists of somewhat poorly drained, moderately permeable soils on outwash plains and stream terraces. These soils formed in loamy outwash. Slope ranges from 0 to 2 percent.

Whitaker soils are similar to Kendall, Starks, and Whitaker Variant soils and commonly are adjacent to Martinsville and Starks soils. Kendall and Starks soils formed in loess and in the underlying outwash. The well drained Martinsville soils are higher on the landscape than the Whitaker soils. Whitaker Variant soils formed in loamy outwash and in the underlying silty till.

Typical pedon of Whitaker loam, 1,960 feet south and 850 feet west of the northeast corner of sec. 36, T. 19 N., R. 11 W.

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

BE—10 to 14 inches; dark grayish brown (10YR 4/2) loam; common fine distinct yellowish brown (10YR 5/6 and 5/4) mottles; moderate fine subangular blocky structure; friable; many distinct grayish brown (10YR 5/2) silt coatings on faces of peds; common fine rounded concretions of iron and manganese oxides; slightly acid; abrupt smooth boundary.

Bt1—14 to 22 inches; grayish brown (10YR 5/2) clay loam; many fine distinct yellowish brown (10YR 5/4) and common fine distinct yellowish brown (10YR 5/6) mottles; moderate fine subangular blocky structure; friable; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common fine rounded concretions of iron and manganese oxides; strongly acid; clear smooth boundary.

Bt2—22 to 34 inches; yellowish brown (10YR 5/4) clay loam; many fine distinct grayish brown (10YR 5/2) and many fine distinct dark yellowish brown (10YR 4/6) mottles; moderate medium subangular blocky structure; friable; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common medium irregular accumulations of iron and manganese oxides; medium acid; gradual smooth boundary.

Bt3—34 to 47 inches; yellowish brown (10YR 5/4), stratified clay loam, loam, and sandy loam; many fine distinct grayish brown (10YR 5/2) and many fine distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; friable; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common medium irregular accumulations of iron and manganese oxides; slightly acid; gradual smooth boundary.

BC—47 to 54 inches; yellowish brown (10YR 5/4), stratified sandy loam, loamy sand, and loam; many medium distinct light brownish gray (10YR 6/2) and many medium distinct yellowish brown (10YR 5/6) mottles; weak coarse subangular blocky structure; friable; few distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common medium irregular accumulations of iron and manganese oxides; neutral; diffuse smooth boundary.

C—54 to 60 inches; dark yellowish brown (10YR 4/4), stratified sandy loam, loamy sand, and loam; many medium distinct light brownish gray (10YR 6/2) and many fine distinct dark yellowish brown (10YR 4/6) mottles; massive; friable; common medium irregular accumulations of iron and manganese oxides; neutral.

The thickness of the solum ranges from 45 to 60 inches. The surface soil is 8 to 14 inches thick.

The A horizon has value of 4 or 5 and chroma of 2 or 3. The Bt horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 to 4. It is clay loam, loam, sandy loam, or sandy clay loam. The C horizon is stratified silt loam, sandy loam, loam, and loamy sand.

Whitaker Variant

The Whitaker Variant consists of somewhat poorly drained, moderately slowly permeable soils on outwash plains. These soils formed in loamy outwash and in the underlying silty till. Slope ranges from 0 to 2 percent.

Whitaker Variant soils are similar to Kendall, Starks, and Whitaker soils and commonly are adjacent to Martinsville and Blount soils. Blount soils formed in silty till or in silty material and in the underlying silty till. Kendall and Starks soils formed in loess and in the underlying outwash. The well drained Martinsville soils are higher on the landscape than the Whitaker Variant soils. Whitaker soils formed entirely in loamy outwash.

Typical pedon of Whitaker Variant loam, 1,680 feet west and 2,800 feet south of the northeast corner of sec. 12, T. 20 N., R. 12 W.

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) loam, light brownish gray (10YR 6/2) dry; moderate fine granular structure; friable; 1 percent fine gravel; neutral; abrupt smooth boundary.

E—9 to 13 inches; grayish brown (10YR 5/2) loam, light gray (10YR 7/2) dry; common fine distinct dark yellowish brown (10YR 4/4) mottles; weak fine subangular blocky structure; friable; many distinct dark grayish brown (10YR 4/2) organic coatings on faces of peds; 1 percent fine gravel; slightly acid; clear smooth boundary.

Bt1—13 to 20 inches; dark brown (10YR 4/3) clay loam; common fine distinct dark yellowish brown (10YR 4/6) and common fine distinct grayish brown (10YR 5/2) mottles; moderate fine subangular blocky structure; friable; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine rounded concretions of iron and manganese oxides; 1 percent fine gravel; slightly acid; gradual smooth boundary.

Bt2—20 to 30 inches; dark brown (10YR 4/3) clay loam; common fine distinct dark yellowish brown (10YR 4/6) and many fine distinct grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure; friable; common distinct dark grayish brown (10YR 4/2) clay films and few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few fine rounded concretions of iron and manganese oxides; 1 percent fine gravel; slightly acid; gradual smooth boundary.

Bt3—30 to 39 inches; dark brown (10YR 4/3) clay loam; many fine distinct yellowish brown (10YR 5/6) and many fine distinct grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure; friable; common distinct dark grayish brown (10YR 4/2) clay films and common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few fine rounded concretions of iron and manganese oxides; 1 percent fine gravel; medium acid; clear smooth boundary.

2Bt4—39 to 48 inches; olive brown (2.5Y 4/4) silty clay loam; many fine distinct light brownish gray (2.5Y 6/2) and common fine distinct light olive brown (2.5Y 5/6) mottles; moderate medium subangular blocky structure; firm; few distinct dark grayish brown (2.5Y 4/2) clay films and common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few fine rounded concretions of iron and manganese oxides; 5 percent fine gravel; neutral; gradual smooth boundary.

2BC—48 to 60 inches; grayish brown (2.5Y 5/3) silty clay loam; common fine distinct light brownish gray (2.5Y 6/2) and few fine distinct light olive brown (2.5Y 5/6) mottles; weak coarse subangular blocky structure; very firm; few distinct grayish brown (2.5Y 5/2) coatings and few distinct very dark gray (10YR 3/1) organic coatings on faces of peds; 5 percent fine gravel; slight effervescence; mildly alkaline.

The thickness of the solum ranges from 45 to 65 inches. The surface soil is 8 to 16 inches thick.

Xenia Series

The Xenia series consists of moderately well drained, moderately slowly permeable soils on till plains and moraines. These soils formed in loess and in the underlying loamy till. Slope ranges from 1 to 5 percent.

Xenia soils are similar to Camden soils and commonly are adjacent to Drummer, Fincastle, and Sabina soils. The well drained Camden soils formed in loess and in the underlying outwash. They have a lighter colored surface layer than the Xenia soils. The poorly drained Drummer soils and the somewhat poorly drained Fincastle and Sabina soils are lower on the landscape than the Xenia soils.

Typical pedon of Xenia silt loam, 1 to 5 percent slopes, 1,800 feet east and 2,100 feet north of the southwest corner of sec. 24, T. 18 N., R. 11 W.

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

E—3 to 11 inches; brown (10YR 5/3) silt loam, light gray (10YR 7/2) dry; weak medium subangular blocky structure parting to weak medium platy; friable; medium acid; clear smooth boundary.

BE—11 to 16 inches; yellowish brown (10YR 5/4) silt loam; moderate very fine subangular blocky structure; friable; strongly acid; clear smooth boundary.

Bt1—16 to 26 inches; yellowish brown (10YR 5/4) silty clay loam; few fine faint grayish brown (10YR 5/2) mottles in the lower 4 inches; moderate very fine subangular blocky structure; friable; many distinct dark brown (10YR 4/3) clay films and common faint pale brown (10YR 6/3) silt coatings on faces of peds; few fine rounded concretions of iron and manganese oxides; medium acid; clear smooth boundary.

2Bt2—26 to 38 inches; dark yellowish brown (10YR 4/4) clay loam; common fine distinct grayish brown (10YR 5/2) and few fine distinct yellowish brown (10YR 5/4 and 5/6) mottles; moderate fine subangular blocky structure; firm; common distinct dark brown (10YR 4/3) clay films on faces of peds; common fine rounded concretions of iron and manganese oxides; 4 percent fine and medium gravel; strongly acid; diffuse smooth boundary.

2Bt3—38 to 49 inches; dark yellowish brown (10YR 4/4) clay loam; many fine distinct grayish brown (2.5Y 5/2) and common fine prominent yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few distinct dark brown (10YR 3/3) organic coatings lining pores; common fine rounded concretions of iron and manganese oxides; 4 percent fine and medium gravel; strongly acid; diffuse smooth boundary.

2BC—49 to 60 inches; dark yellowish brown (10YR 4/4) loam; many fine distinct brown (2.5Y 5/2) and common fine distinct yellowish brown (10YR 5/6) mottles; weak coarse subangular blocky structure; firm; few faint dark brown (10YR 3/3) organic coatings lining pores; common fine rounded concretions of iron and manganese oxides; 4 percent fine and medium gravel; slightly acid.

The thickness of the solum ranges from 45 to 65 inches. The thickness of the loess ranges from 22 to 40 inches. The surface soil is 6 to 15 inches in thickness.

The A horizon has value of 3 or 4 and chroma of 2 to 4. The Bt horizon has value of 4 or 5 and chroma of 3 or 4. It is silt loam or silty clay loam. The 2Bt or 2BC horizon is clay loam or loam.

Formation of the Soils

Soil-forming processes act on deposited or accumulated geologic material. The characteristics of the soil at any given point are determined by the parent material, the plant and animal life on and in the soil, the climate, the topography, and the length of time that the processes of soil formation have acted on the soil material.

Climate and plant and animal life are active factors of soil formation. They act on the parent material that has accumulated through the weathering of rocks or that was relocated by water, glaciers, or wind and slowly change it to a natural body that has genetically related horizons. The effects of climate and plant and animal life are conditioned by topography. The parent material affects the kind of soil profile that forms. Finally, time is needed to change the parent material into a soil. Usually, a long time is needed for the formation of distinct horizons. The importance of each of the soil-forming factors differs from place to place, and each modifies the effects of the other four. In some areas one factor dominates the formation of a soil.

Parent Material

Parent material is the unconsolidated material in which a soil forms. It determines the chemical and mineralogical composition and the texture of the soil. Although almost all of the parent material in Vermilion County is of glacial origin, the properties vary greatly, sometimes within small areas, depending on how the material was deposited. Most of the parent material was deposited by glaciers, meltwater from the glaciers, or wind. In some areas it was reworked and redeposited by subsequent actions of water and wind. The soils in the county formed dominantly in glacial till, outwash deposits, loess, alluvium, or eolian material. Weathered bedrock, organic-rich mineral colluvium, and strip-mine overburden are other parent materials in the county.

Glacial till is material laid down directly by glaciers with a minimum of water action. It consists of particles of different sizes that are mixed together. In Vermilion County, the uppermost layer of glacial till was deposited during the Wisconsin Glaciation, about 22,000 to 16,000 years ago *(12)*. In the southern half of the county and in the northeast corner, loamy till was deposited. Miami and Corwin soils are among the soils that formed in this till. The Newtown and Gifford Moraines consist of silty till that was deposited over most of the area to the north. Elliott and Blount soils are examples of soils that formed in this till. In the northwestern part of the county, around Rankin, clayey till was deposited. Swygert and Clarence soils formed in this till.

Outwash material was deposited by running water from melting glaciers. The size of the particles varies, depending on the speed of the stream that carried the material. Coarser particles, such as sand and gravel, were deposited by relatively swiftly moving water. The finer particles, such as silt and clay, were deposited by the more slowly moving water. Outwash deposits generally consist of layers of particles that are similar in size, such as loam, silt loam, sand, or gravel. In many places the outwash deposits are more than 5 feet thick. La Hogue and Wea soils formed in this outwash. In other places the outwash is a thin deposit overlying glacial till. Andres and Mona soils formed in these materials.

Loess, or wind-deposited silty material, was deposited over the glacial till and outwash in many areas. The Mississippi, Illinois, and Wabash River Valleys were the main source of the loess. Wind picked up silt from the valley floors and redeposited it on the uplands. In most of the area north of the Newtown Moraine, the loess is thin if it occurs at all. In most of the southern half of the county, the loess is 20 to more than 60 inches thick. Ipava and Sable soils formed in loess. Brenton and Flanagan soils formed in loess and in the underlying glacial outwash or till.

Alluvium is material deposited relatively recently by floodwater from streams. The material varies in texture, depending on the speed of the water from which it was deposited. Examples of alluvial soils are Landes and Sawmill soils.

Sandy and loamy eolian materials were deposited when wind removed loamy or sandy material from outwash areas and redeposited it in dunelike formations. Examples of soils that formed in eolian materials are Sparta and Onarga soils.

Shale and siltstone bedrock underlies the glacial deposits in Vermilion County. On some of the side slopes along the Vermilion River, there are no glacial deposits over the bedrock. Marseilles soils formed in material weathered from the bedrock on these slopes.

Organic-rich mineral colluvium was deposited in some of the depressions on the till plains in the northern half of the county. After the glaciers withdrew from the area, these depressions were wet all or most of the year. Organic material from the remains of water-tolerant plants and mineral colluvium from surrounding slopes were deposited in the depressions. Peotone soils formed in organic-rich mineral colluvium.

Strip-mine overburden consists of glacial deposits, mostly till, which have been stripped from the land during mining operations, mixed together, and redeposited. In many areas fragments of shale, siltstone, and coal are also mixed with the overburden. Lenzburg soils formed in these deposits.

Plant and Animal Life

Plants are the principal living organisms affecting the soils in Vermilion County. Micro-organisms, earthworms, insects, large burrowing animals, and humans also have affected soil formation. The chief contribution of plant and animal life is the addition of organic matter and nitrogen to the soil. The kind and amount of organic material on and in the soil depends on the kind of plants that grew on the soil. The remains of these plants accumulate in the surface layer, decay, and eventually become organic matter. The roots of the plants provide channels for the downward movement of water through the soil and add organic matter as they decay. Micro-organisms in the soil help to decompose the organic matter and thus help to provide plant nutrients.

The native vegetation in Vermilion County was mainly prairie grasses. Areas adjacent to the streams were wooded, however, and a few scattered areas supported marsh vegetation. Soils that formed under prairie grasses have a darker surface layer and a higher content of organic matter than soils that formed under forest vegetation. Native prairie grasses in the county include big bluestem, indiangrass, and switchgrass. Trees in the wooded areas include oak, hickory, maple, elm, and ash. Elliott and Flanagan soils are examples of soils that formed under prairie vegetation. Blount and Sabina soils are examples of soils that formed under forest vegetation.

In some areas human activities have significantly affected soil formation. Strip mining for coal, clay, and limestone and cutting and filling for roadway construction have greatly altered the soils in some areas.

Climate

Climate influences the kind and amount of plant and animal life on and in the soil. Precipitation affects the weathering of minerals and the transporting of soil material. Temperature determines the rate of chemical reactions that occur in the soil. The general climate has had an important overall influence on the characteristics of the soils, but it does not cause major differences among soils in a relatively small area.

The climate in Vermilion County is temperate and humid. It is probably similar to the climate under which the soils formed. More detailed information about the climate of the county is provided in the section "General Nature of the County."

Topography

Variations in the slope of the land surface greatly affect natural drainage, erosion, the runoff rate, and soil temperature. In Vermilion County, the slopes range from 0 to 80 percent. Natural drainage ranges from excessively drained to very poorly drained.

Topography influences the formation of soils by its effect on drainage. Drainage, in turn, determines the color of the subsoil. Differences in the color of the subsoil are affected by the degree of oxidation of certain mineral compounds, chiefly iron. Ashkum soils are poorly drained and have a water table near the surface much of the year. The water in the soil pores restricts aeration, and the iron compounds are reduced. As a result, the subsoil is dull gray and is mottled. The gently sloping Catlin soils, however, are moderately well drained. The water table is lower in these soils, and some of the rainfall runs off the surface. Better aeration causes the iron compounds in the Catlin soils to be oxidized, which results in a brownish subsoil.

Topography also influences the amount of erosion by affecting the rate of surface runoff. The more sloping soils generally are more eroded than the less sloping soils. The moderately eroded Dana soils, for example, are gently sloping and have a medium runoff rate. The uneroded Drummer soils, however, are nearly level. Runoff is slow to ponded on these soils.

Time

The length of time needed for the formation of a soil depends on the other factors of soil formation. Differences in the length of time that the parent materials have been in place are commonly reflected in the degree of profile development. The relatively young Lenzburg soils, for example, have very little profile development compared to the much older Corwin soils. The more rapidly permeable soils form more readily than slowly permeable soils because lime and other soluble minerals are leached more quickly. The moderately permeable Catlin soils, for example, have a thicker solum and deeper carbonates than the very slowly permeable Clarence soils.

The soils in Vermilion County range from young to mature. The youngest soils are on recently disturbed land, such as strip-mined areas. The more mature soils are on stable parts of upland areas. Soils on flood plains are generally less developed than upland soils because they receive repeated deposition of alluvial material.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

Ablation till. Loose, permeable till deposited during the final downwasting of glacial ice. Lenses of crudely sorted sand and gravel are common.

AC soil. A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

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

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation-exchange capacity.

Bedding planes. Fine stratifications, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediments.

Bottom land. The normal flood plain of a stream, subject to flooding.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

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.

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 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.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15 to 38 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Colluvium. Soil material, rock fragments, or both moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex, soil. A map unit of two or more kinds of soil 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 are somewhat similar in all areas.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

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. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are:

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

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.

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.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

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

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

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

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

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

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

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

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

Drainage, surface. Runoff, or surface flow of water, from an area.

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.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

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, for example, fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay in the soil. The soil is not a source of gravel or sand for construction purposes.

Fast intake (in tables). The rapid movement of water into the soil.

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

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Fine textured soil. Sandy clay, silty clay, or clay.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Foot slope. The inclined surface at the base of a hill.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Glacial drift (geology). Pulverized and other rock material transported by glacial ice and then deposited. Also, the sorted and unsorted material deposited by streams flowing from glaciers.

Glacial outwash (geology). Gravel, sand, and silt, commonly stratified, deposited by glacial meltwater.

Glacial till (geology). Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Glaciofluvial deposits (geology). Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

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 up to 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water (geology). Water filling all the unblocked pores of the material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric and the more decomposed sapric material.

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. The major horizons are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, any plowed or disturbed surface layer.

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 O, A, or E horizon. The B horizon is in part a layer of transition from the overlying horizon 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) granular, 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 horizon. 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.—Hard, consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon but 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-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Lacustrine deposit (geology). Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

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.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by the wind.

Low strength. The soil is not strong enough to support loads.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately 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 (geology). An accumulation of earth, stones, and other debris deposited by a glacier. Some types are terminal, lateral, medial, and ground.

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. Mottling generally indicates poor aeration and impeded drainage. 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.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

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.

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it is generally low in relief.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil, adversely affecting the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

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.

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

Extremely acid	below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep-sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

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

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

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

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Sinkhole. A depression in the landscape where limestone has been dissolved.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slick spot. A small area of soil having a puddled, crusted, or smooth surface and an excess of exchangeable sodium. The soil is generally silty or clayey, is slippery when wet, and is low in productivity. A "scald."

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil 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 underlying material. The living roots and plant and animal activities are largely confined to the solum.

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.

Stripcropping. Growing crops in a systematic arrangement of strips or bands which provide vegetative barriers to soil blowing 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).

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

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from about 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. It includes all subdivisions of these horizons.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terminal moraine. A belt of thick glacial drift that generally marks the termination of important glacial advances.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). A layer of otherwise suitable soil material that is too thin for the specified use.

Till plain. An extensive area of nearly level to undulating soils underlain by glacial till.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

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.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Variant, soil. A soil having properties sufficiently different from those of other known soils to justify a new series name, but occurring in such a limited geographic area that creation of a new series is not justified.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

(Recorded in the period 1960-91 at Danville, Illinois)

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January-----	34.1	16.4	25.2	61	-17	1	1.89	0.65	2.91	4	5.7
February----	39.0	20.2	29.6	64	-12	3	1.90	.90	2.75	4	6.6
March-------	51.2	30.5	40.9	79	3	46	3.10	1.75	4.30	7	3.5
April-------	65.2	41.2	53.2	86	21	172	4.01	2.01	5.75	7	.3
May---------	75.6	50.5	63.0	92	29	408	4.29	2.18	6.13	7	.0
June--------	84.3	59.4	71.8	97	42	653	4.08	2.12	5.80	6	.0
July--------	86.8	63.6	75.2	98	48	781	4.29	1.96	6.29	6	.0
August------	84.6	61.6	73.1	96	46	716	3.97	2.14	5.58	5	.0
September---	79.1	54.8	66.9	94	35	508	3.04	1.13	4.64	5	.0
October-----	67.1	42.9	55.0	86	22	208	3.07	1.37	4.52	5	.1
November----	52.5	33.5	43.0	76	12	47	3.04	1.64	4.27	6	1.1
December----	38.8	22.3	30.5	65	-11	7	2.97	1.35	4.36	6	6.2
Yearly:											
Average---	63.2	41.4	52.3	---	---	---	---	---	---	---	---
Extreme---	112	-26	---	99	-19	---	---	---	---	---	---
Total-----	---	---	---	---	---	3,551	39.65	33.66	45.14	68	23.6

* 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 1960-91 at Danville, 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. 16	Apr. 28	May 13
2 years in 10 later than--	Apr. 11	Apr. 23	May 8
5 years in 10 later than--	Apr. 1	Apr. 13	Apr. 28
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 19	Oct. 9	Sept. 30
2 years in 10 earlier than--	Oct. 24	Oct. 14	Oct. 3
5 years in 10 earlier than--	Nov. 3	Oct. 24	Oct. 10

TABLE 3.--GROWING SEASON

(Recorded in the period 1960-91 at Danville, 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	195	172	143
8 years in 10	202	179	150
5 years in 10	214	193	164
2 years in 10	227	206	178
1 year in 10	234	213	185

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

Map symbol	Soil name	Acres	Percent
17	Keomah silt loam	2,575	0.4
23A	Blount silt loam, 0 to 2 percent slopes	12,145	2.1
23B2	Blount silt loam, 2 to 5 percent slopes, eroded	9,980	1.7
27C3	Miami silt loam, 5 to 12 percent slopes, severely eroded	2,410	0.4
27F	Miami loam, 16 to 35 percent slopes	1,725	0.3
43	Ipava silt loam	2,815	0.5
56B2	Dana silt loam, 2 to 5 percent slopes, eroded	6,905	1.2
59	Lisbon silt loam	5,840	1.0
67	Harpster silty clay loam	705	0.1
68	Sable silty clay loam	5,155	0.9
69	Milford silty clay loam	14,185	2.5
88B	Sparta loamy fine sand, 1 to 6 percent slopes	485	0.1
91A	Swygert silty clay loam, 0 to 2 percent slopes	6,700	1.2
91B2	Swygert silty clay loam, 2 to 5 percent slopes, eroded	3,445	0.6
91C2	Swygert silty clay loam, 5 to 7 percent slopes, eroded	205	*
102	La Hogue loam	6,595	1.1
107	Sawmill silty clay loam	5,910	1.0
125	Selma silt loam	4,040	0.7
131B	Alvin fine sandy loam, 1 to 5 percent slopes	955	0.2
132	Starks silt loam	2,200	0.4
134B	Camden silt loam, 1 to 5 percent slopes	1,980	0.3
145B2	Saybrook silt loam, 2 to 5 percent slopes, eroded	1,650	0.3
146A	Elliott silt loam, 0 to 2 percent slopes	48,485	8.4
146B2	Elliott silty clay loam, 2 to 6 percent slopes, eroded	24,075	4.2
147A	Clarence silty clay loam, 0 to 2 percent slopes	2,725	0.5
147B2	Clarence silty clay, 2 to 6 percent slopes, eroded	1,080	0.2
148A	Proctor silt loam, 0 to 2 percent slopes	1,465	0.3
148B	Proctor silt loam, 2 to 5 percent slopes	2,515	0.4
148C2	Proctor silt loam, 5 to 8 percent slopes, eroded	275	*
149	Brenton silt loam	9,525	1.7
150B	Onarga sandy loam, 1 to 5 percent slopes	885	0.2
150C2	Onarga fine sandy loam, 5 to 8 percent slopes, eroded	205	*
152	Drummer silty clay loam	91,570	15.9
153	Pella silty clay loam	2,920	0.5
154	Flanagan silt loam	56,225	9.7
171B	Catlin silt loam, 2 to 5 percent slopes	3,555	0.6
182	Peotone mucky silty clay loam, marly substratum	325	0.1
183	Shaffton loam	4,895	0.8
194C2	Morley silt loam, 5 to 10 percent slopes, eroded	1,540	0.3
194D3	Morley silt loam, 10 to 18 percent slopes, severely eroded	745	0.1
194F	Morley silt loam, 18 to 35 percent slopes	940	0.2
194G	Morley silt loam, 35 to 70 percent slopes	4,835	0.8
198	Elburn silt loam	4,740	0.8
199B	Plano silt loam, 2 to 5 percent slopes	1,995	0.3
221C3	Parr loam, 5 to 12 percent slopes, severely eroded	250	*
223B2	Varna silt loam, 2 to 5 percent slopes, eroded	1,845	0.3
223C2	Varna silt loam, 5 to 8 percent slopes, eroded	1,635	0.3
224G	Strawn silt loam, 35 to 75 percent slopes	9,050	1.6
230	Rowe silty clay	3,605	0.6
232	Ashkum silty clay loam	65,940	11.4
233B	Birkbeck silt loam, 1 to 5 percent slopes	2,200	0.4
235	Bryce silty clay	14,025	2.4
236	Sabina silt loam	12,250	2.1
238	Rantoul silty clay	370	0.1
241C	Chatsworth silty clay, 5 to 10 percent slopes	140	*
242	Kendall silt loam	1,195	0.2
291B	Xenia silt loam, 1 to 5 percent slopes	7,840	1.4
293	Andres loam	16,460	2.9
294B	Symerton loam, 2 to 5 percent slopes	3,755	0.7
295	Mokena loam	1,505	0.3
302	Ambraw loam	2,285	0.4
330	Peotone silty clay loam	1,390	0.2
362	Whitaker Variant loam	820	0.1

See footnote at end of table.

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

Map symbol	Soil name	Acres	Percent
387B	Ockley loam, 1 to 4 percent slopes	1,415	0.2
398	Wea silt loam	1,565	0.3
430	Raddle silt loam	1,075	0.2
440A	Jasper loam, 0 to 2 percent slopes	1,930	0.3
440B	Jasper loam, 2 to 5 percent slopes	1,070	0.2
440C2	Jasper loam, 5 to 10 percent slopes, eroded	205	*
448B	Mona silt loam, 1 to 5 percent slopes	795	0.1
473	Rossburg loam	1,155	0.2
481	Raub silt loam	9,665	1.7
490	Odell loam	695	0.1
495B2	Corwin silt loam, 2 to 5 percent slopes, eroded	2,770	0.5
496A	Fincastle silt loam, 0 to 2 percent slopes	10,860	1.9
496B2	Fincastle silt loam, 2 to 6 percent slopes, eroded	2,930	0.5
533	Urban land	1,925	0.3
536	Dumps, mine	145	*
549G	Marseilles loam, 40 to 80 percent slopes	1,240	0.2
570B	Martinsville loam, 2 to 5 percent slopes	1,880	0.3
570C2	Martinsville loam, 5 to 12 percent slopes, eroded	1,075	0.2
570F	Martinsville sandy loam, 16 to 35 percent slopes	320	0.1
571	Whitaker loam	615	0.1
802B	Orthents, loamy, undulating	2,000	0.3
802F	Orthents, loamy, steep	415	0.1
864	Pits, quarry	130	*
865	Pits, gravel	215	*
871B	Lenzburg loam, 1 to 7 percent slopes	3,435	0.6
871G3	Lenzburg gravelly loam, gullied, 20 to 70 percent slopes	2,830	0.5
2023B	Blount-Urban land complex, 1 to 6 percent slopes	1,010	0.2
2146A	Elliott-Urban land complex, 0 to 3 percent slopes	595	0.1
2152	Drummer-Urban land complex	485	0.1
2232	Ashkum-Urban land complex	360	0.1
2242A	Kendall-Urban land complex, 0 to 3 percent slopes	2,365	0.4
2291B	Xenia-Urban land complex, 1 to 5 percent slopes	250	*
2570B	Martinsville-Urban land complex, 1 to 5 percent slopes	240	*
7304A	Landes fine sandy loam, rarely flooded, 0 to 3 percent slopes	2,360	0.4
8304	Landes fine sandy loam, occasionally flooded	2,845	0.5
	Water	3,480	0.6
	Total	577,030	100.0

* Less than 0.05 percent. The combined extent of the soils assigned an asterisk in the "Percent" column is about 0.3 percent of the survey area.

TABLE 5.--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
17	Keomah silt loam (where drained)
23A	Blount silt loam, 0 to 2 percent slopes (where drained)
23B2	Blount silt loam, 2 to 5 percent slopes, eroded (where drained)
43	Ipava silt loam
56B2	Dana silt loam, 2 to 5 percent slopes, eroded
59	Lisbon silt loam
67	Harpster silty clay loam (where drained)
68	Sable silty clay loam (where drained)
69	Milford silty clay loam (where drained)
91A	Swygert silty clay loam, 0 to 2 percent slopes
91B2	Swygert silty clay loam, 2 to 5 percent slopes, eroded
102	La Hogue loam
107	Sawmill silty clay loam (where drained and either protected from flooding or not frequently flooded during the growing season)
125	Selma silt loam (where drained)
131B	Alvin fine sandy loam, 1 to 5 percent slopes
132	Starks silt loam (where drained)
134B	Camden silt loam, 1 to 5 percent slopes
145B2	Saybrook silt loam, 2 to 5 percent slopes, eroded
146A	Elliott silt loam, 0 to 2 percent slopes
146B2	Elliott silty clay loam, 2 to 6 percent slopes, eroded
148A	Proctor silt loam, 0 to 2 percent slopes
148B	Proctor silt loam, 2 to 5 percent slopes
149	Brenton silt loam
150B	Onarga sandy loam, 1 to 5 percent slopes
152	Drummer silty clay loam (where drained)
153	Pella silty clay loam (where drained)
154	Flanagan silt loam
171B	Catlin silt loam, 2 to 5 percent slopes
182	Peotone mucky silty clay loam, marly substratum (where drained)
183	Shaffton loam (where protected from flooding or not frequently flooded during the growing season)
198	Elburn silt loam
199B	Plano silt loam, 2 to 5 percent slopes
223B2	Varna silt loam, 2 to 5 percent slopes, eroded
232	Ashkum silty clay loam (where drained)
233B	Birkbeck silt loam, 1 to 5 percent slopes
235	Bryce silty clay (where drained)
236	Sabina silt loam (where drained)
242	Kendall silt loam (where drained)
291B	Xenia silt loam, 1 to 5 percent slopes
293	Andres loam
294B	Symerton loam, 2 to 5 percent slopes
295	Mokena loam
302	Ambraw loam (where drained and either protected from flooding or not frequently flooded during the growing season)
330	Peotone silty clay loam (where drained)
362	Whitaker Variant loam (where drained)
387B	Ockley loam, 1 to 4 percent slopes
398	Wea silt loam
430	Raddle silt loam
440A	Jasper loam, 0 to 2 percent slopes
440B	Jasper loam, 2 to 5 percent slopes
448B	Mona silt loam, 1 to 5 percent slopes
473	Rossburg loam
481	Raub silt loam
490	Odell loam
495B2	Corwin silt loam, 2 to 5 percent slopes, eroded
496A	Fincastle silt loam, 0 to 2 percent slopes (where drained)

TABLE 5.--PRIME FARMLAND--Continued

Map symbol	Soil name
496B2	Fincastle silt loam, 2 to 6 percent slopes, eroded (where drained)
570B	Martinsville loam, 2 to 5 percent slopes
571	Whitaker loam (where drained)
871B	Lenzburg loam, 1 to 7 percent slopes
7304A	Landes fine sandy loam, rarely flooded, 0 to 3 percent slopes
8304	Landes fine sandy loam, occasionally flooded

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE

(Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Oats	Orchard-grass-alfalfa hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Bu	Tons	AUM*
17---------------- Keomah	IIw	131	44	---	72	---	8.0
23A--------------- Blount	IIw	106	35	48	64	4.3	---
23B2-------------- Blount	IIe	102	34	46	61	4.1	---
27C3-------------- Miami	IVe	90	32	40	---	3.0	---
27F--------------- Miami	VIe	---	---	---	---	---	---
43---------------- Ipava	I	163	52	66	91	---	---
56B2-------------- Dana	IIe	125	44	50	---	---	---
59---------------- Lisbon	I	146	48	59	86	5.5	9.2
67---------------- Harpster	IIw	136	44	52	74	---	---
68---------------- Sable	IIw	156	51	61	85	---	---
69---------------- Milford	IIw	131	48	56	81	5.2	8.6
88B--------------- Sparta	IVs	50	23	---	47	---	---
91A--------------- Swygert	IIw	114	39	51	73	4.5	7.5
91B2-------------- Swygert	IIe	107	37	48	69	4.2	7.1
91C2-------------- Swygert	IIIe	109	37	49	70	4.3	7.2
102--------------- La Hogue	I	129	43	56	80	5.2	8.6
107--------------- Sawmill	IIIw	132	42	---	---	---	---
125--------------- Selma	IIw	136	44	53	76	---	---
131B-------------- Alvin	IIe	97	33	48	---	4.3	7.1

See footnote at end of table.

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Oats	Orchard-grass-alfalfa hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Bu	Tons	AUM*
132------------- Starks	IIw	129	40	55	72	5.1	---
134B------------ Camden	IIe	124	39	54	71	5.0	8.2
145B2----------- Saybrook	IIe	133	44	58	81	5.4	8.9
146A------------ Elliott	IIw	128	45	55	79	5.1	8.5
146B2----------- Elliott	IIe	115	43	50	71	4.6	7.7
147A------------ Clarence	IIIw	100	35	47	66	4.1	6.8
147B2----------- Clarence	IIIe	94	33	44	62	3.8	6.4
148A------------ Proctor	I	144	44	59	88	5.5	9.2
148B------------ Proctor	IIe	143	44	58	87	5.4	9.1
148C2----------- Proctor	IIIe	135	41	55	83	5.2	8.6
149------------- Brenton	I	160	47	62	91	---	9.8
150B------------ Onarga	IIe	108	36	48	73	---	7.0
150C2----------- Onarga	IIIe	103	32	45	69	---	6.6
152------------- Drummer	IIw	154	51	61	83	---	9.2
153------------- Pella	IIw	140	48	56	78	---	---
154------------- Flanagan	I	162	52	67	92	6.1	10.2
171B------------ Catlin	IIe	149	46	60	86	5.7	9.6
182------------- Peotone	IIIw	123	42	43	58	---	---
183------------- Shaffton	IIIw	111	37	---	62	---	7.0
194C2----------- Morley	IIIe	97	33	44	60	4.0	6.7

See footnote at end of table.

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Oats	Orchard-grass-alfalfa hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Bu	Tons	AUM*
194D3----------- Morley	IVe	85	---	39	53	3.6	5.9
194F------------ Morley	VIe	---	---	---	---	3.1	5.0
194G------------ Morley	VIIe	---	---	---	---	---	---
198------------- Elburn	I	161	50	63	94	6.1	10.2
199B------------ Plano	IIe	150	45	59	89	---	9.6
221C3----------- Parr	IVe	100	35	45	---	3.3	---
223B2----------- Varna	IIe	120	40	51	72	4.7	7.8
223C2----------- Varna	IIIe	110	39	50	71	4.5	7.5
224G------------ Strawn	VIIe	---	---	---	---	---	---
230------------- Rowe	IIIw	108	40	45	63	4.0	6.7
232------------- Ashkum	IIw	130	47	54	79	5.0	8.3
233B------------ Birkbeck	IIe	122	41	54	69	4.9	8.2
235------------- Bryce	IIw	120	43	48	70	4.4	7.3
236------------- Sabina	IIw	133	42	56	75	5.2	8.7
238------------- Rantoul	IIIw	99	35	36	50	---	---
241C------------ Chatsworth	VIe	---	---	---	---	---	1.6
242------------- Kendall	IIw	135	41	55	75	---	8.7
291B------------ Xenia	IIe	120	42	48	---	4.0	---
293------------- Andres	I	145	48	61	88	5.5	9.1
294B------------ Symerton	IIe	135	44	58	82	5.3	8.9

See footnote at end of table.

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Oats	Orchard-grass-alfalfa hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Bu	Tons	AUM*
295------------- Mokena	IIw	126	41	55	77	4.7	7.8
302------------- Ambraw	IVw	100	30	---	---	---	---
330------------- Peotone	IIw	123	42	43	58	---	---
362------------- Whitaker Variant	IIw	118	41	47	69	3.9	8.0
387B------------ Ockley	IIe	110	38	44	---	3.6	---
398------------- Wea	IIs	120	42	48	---	4.0	---
430------------- Raddle	I	149	45	59	83	5.8	9.7
440A------------ Jasper	I	130	46	52	---	---	---
440B------------ Jasper	IIe	125	44	50	---	---	---
440C2----------- Jasper	IIIe	115	40	46	---	---	---
448B------------ Mona	IIe	114	37	50	73	4.5	7.4
473------------- Rossburg	I	130	44	54	---	5.0	---
481------------- Raub	IIw	140	49	56	---	4.6	---
490------------- Odell	IIw	130	46	58	---	4.3	---
495B2----------- Corwin	IIe	115	40	52	---	---	---
496A------------ Fincastle	IIw	130	46	52	---	---	---
496B2----------- Fincastle	IIe	125	44	50	---	---	---
533. Urban land							
536. Dumps							
549G------------ Marseilles	VIIe	---	---	---	---	---	3.3

See footnote at end of table.

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Oats	Orchard-grass-alfalfa hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Bu	Tons	AUM*
570B------------ Martinsville	IIe	120	42	48	---	4.0	---
570C2----------- Martinsville	IIIe	105	37	42	---	3.4	---
570F------------ Martinsville	VIIe	---	---	---	---	---	---
571------------- Whitaker	IIw	125	44	50	---	4.1	---
802B, 802F. Orthents							
864, 865. Pits							
871B------------ Lenzburg	IIe	75	23	26	---	3.4	---
871G3----------- Lenzburg	VIIe	---	---	---	---	---	---
2023B. Blount-Urban land							
2146A. Elliott-Urban land							
2152. Drummer-Urban land							
2232. Ashkum-Urban land							
2242A. Kendall-Urban land							
2291B. Xenia-Urban land							
2570B. Martinsville-Urban land							
7304A----------- Landes	IIs	99	34	45	62	---	6.2
8304------------ Landes	IIw	75	26	34	47	---	4.7

* Animal unit month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

TABLE 7.--CAPABILITY CLASSES AND SUBCLASSES

(Miscellaneous areas are excluded. Absence of an entry indicates no acreage)

Class	Total acreage	Major management concerns (Subclass)		
		Erosion (e)	Wetness (w)	Soil problem (s)
		Acres	Acres	Acres
I	107,825	---	---	---
II	407,094	88,669	314,500	3,925
III	24,050	6,220	17,830	---
IV	6,175	3,405	2,285	485
V	---	---	---	---
VI	2,805	2,805	---	---
VII	18,275	18,275	---	---
VIII	---	---	---	---

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY

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

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Productivity class*	Trees to plant
27C3: Miami	5A	Slight	Slight	Slight	Slight	White oak	90	5	Eastern white pine, red pine, white ash, yellow-poplar, black walnut.
						Yellow-poplar	98	7	
						Sweetgum	76	5	
27F: Miami	5R	Moderate	Moderate	Slight	Slight	White oak	90	5	Eastern white pine, red pine, white ash, yellow-poplar, black walnut.
						Yellow-poplar	98	7	
						Sweetgum	76	5	
107: Sawmill	5W	Slight	Moderate	Moderate	Moderate	Pin oak	90	5	American sycamore, black spruce, hackberry, European larch, green ash, pin oak, red maple, swamp white oak.
						Eastern cottonwood	---	---	
						Sweetgum	---	---	
						Cherrybark oak	---	---	
						American sycamore	---	---	
194C2, 194D3: Morley	4A	Slight	Slight	Slight	Slight	White oak	80	4	White oak, black walnut, green ash, eastern white pine, Norway spruce, red pine, white spruce.
						Northern red oak	80	4	
						Yellow-poplar	90	6	
						Black walnut	---	---	
						Bur oak	---	---	
						Shagbark hickory	---	---	
194F: Morley	4R	Moderate	Moderate	Slight	Slight	White oak	80	4	White oak, black walnut, green ash, eastern white pine, Norway spruce, red pine, white spruce.
						Northern red oak	80	4	
						Yellow-poplar	90	6	
						Black walnut	---	---	
						Bur oak	---	---	
						Shagbark hickory	---	---	
194G: Morley	4R	Severe	Severe	Slight	Slight	White oak	80	4	White oak, black walnut, green ash, eastern white pine, Norway spruce, red pine, white spruce.
						Northern red oak	80	4	
						Yellow-poplar	90	6	
						Black walnut	---	---	
						Bur oak	---	---	
						Shagbark hickory	---	---	

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordi- nation symbol	Management concerns: Erosion hazard	Management concerns: Equip- ment limita- tion	Management concerns: Seedling mortal- ity	Management concerns: Wind- throw hazard	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Produc- tivity class*	Trees to plant
224G------------ Strawn	4R	Severe	Severe	Moderate	Slight	White oak-----------	80	4	White oak, black walnut, northern red oak, green ash, eastern white pine, red pine, sugar maple.
						Northern red oak----	80	4	
						Yellow-poplar-------	90	6	
						Black walnut--------	---	---	
473------------- Rossburg	5A	Slight	Slight	Slight	Slight	White oak-----------	90	5	Black walnut, white oak, yellow-poplar, northern red oak, white ash, eastern white pine, red pine, green ash, black cherry, black locust, American sycamore, eastern cottonwood.
						Northern red oak----	---	---	
						Black walnut--------	---	---	
						Black cherry--------	---	---	
						Sugar maple---------	---	---	
						White ash-----------	---	---	
						Yellow-poplar-------	---	---	
549G------------ Marseilles	3R	Severe	Severe	Slight	Slight	White oak-----------	66	3	White oak, northern red oak, black oak, white ash, eastern white pine, Scotch pine, black walnut.
						Northern red oak----	66	3	
						Black oak-----------	---	---	
						White ash-----------	---	---	
570C2----------- Martinsville	4A	Slight	Slight	Slight	Slight	White oak-----------	80	4	Eastern white pine, red pine, white ash, yellow-poplar, black walnut.
						Yellow-poplar-------	98	7	
						Sweetgum------------	76	5	
570F------------ Martinsville	4R	Moderate	Moderate	Slight	Slight	White oak-----------	80	4	Eastern white pine, red pine, white ash, yellow-poplar, black walnut.
						Yellow-poplar-------	98	7	
						Sweetgum------------	76	5	
871B------------ Lenzburg	5A	Slight	Slight	Slight	Slight	Sweetgum------------	76	5	Black walnut, green ash, white ash, eastern cottonwood.
						Black walnut--------	73	---	
						Eastern cottonwood--	---	---	
871G3----------- Lenzburg	5R	Severe	Severe	Slight	Slight	Sweetgum------------	76	5	Black walnut, green ash, white ash, eastern cottonwood.
						Black walnut--------	73	---	
						Eastern cottonwood--	---	---	

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Productivity class*	Trees to plant
7304A, 8304 Landes	7A	Slight	Slight	Slight	Slight	Yellow-poplar	95	7	Eastern cottonwood, yellow-poplar, American sycamore, sweetgum, green ash, black walnut, eastern white pine, sugar maple.
						Eastern cottonwood	105	10	
						American sycamore	---	---	
						Sweetgum	---	---	
						Green ash	---	---	

* Productivity class is the yield in cubic meters per hectare per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

TABLE 9.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS

(The symbol < means less than; > means more than. Absence of an entry indicates that trees generally do not grow to the given height on that soil)

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--			
	8-15	16-25	26-35	>35
17 Keomah	Silky dogwood, Amur honeysuckle, Amur privet, American cranberrybush.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
23A, 23B2 Blount	American cranberrybush, Amur honeysuckle, arrowwood, Amur privet, Washington hawthorn, eastern redcedar, silky dogwood.	Osage-orange, green ash, Austrian pine.	Eastern white pine, pin oak.	---
27C3, 27F Miami	Amur honeysuckle, Amur privet, American cranberrybush, silky dogwood.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
43 Ipava	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
56B2 Dana	Amur honeysuckle, American cranberrybush, Amur privet, silky dogwood.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
59 Lisbon	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
67 Harpster	Nannyberry viburnum, Washington hawthorn.	White spruce, northern whitecedar, eastern redcedar, green ash, Osage-orange.	Black willow	---
68 Sable	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern whitecedar, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.
69 Milford	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern whitecedar, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.
88B Sparta	Amur honeysuckle, lilac, eastern redcedar, radiant crabapple, Washington hawthorn, autumn-olive.	Red pine, jack pine, Austrian pine.	Eastern white pine	---

TABLE 9.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of-- 8-15	16-25	26-35	>35
91A, 91B2, 91C2---Swygert	American cranberrybush, Amur honeysuckle, arrowwood, Amur privet, Washington hawthorn, eastern redcedar.	Osage-orange, green ash, Austrian pine.	Pin oak---------------	---
102---------------La Hogue	Silky dogwood, Amur honeysuckle, American cranberrybush, Amur privet.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce---------	Pin oak, eastern white pine.
107---------------Sawmill	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Norway spruce, Austrian pine, northern whitecedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine----	Pin oak.
125---------------Selma	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern whitecedar, Austrian pine, Norway spruce.	Eastern white pine----	Pin oak.
131B--------------Alvin	Amur privet, Washington hawthorn, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, northern whitecedar, Osage-orange, eastern redcedar.	Eastern white pine, red pine, Norway spruce.	---
132---------------Starks	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce---------	Eastern white pine, pin oak.
134B--------------Camden	Amur honeysuckle, Amur privet, silky dogwood, American cranberrybush.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
145B2-------------Saybrook	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
146A, 146B2-------Elliott	Silky dogwood, Amur honeysuckle, Amur privet, American cranberrybush.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
147A--------------Clarence	Eastern redcedar, American cranberrybush, Amur privet, Washington hawthorn, Amur honeysuckle, autumn-olive, silky dogwood.	Austrian pine, green ash, Osage-orange.	Eastern white pine, pin oak.	---
147B2-------------Clarence	Eastern redcedar------	Austrian pine---------	---	---

TABLE 9.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of-- 8-15	16-25	26-35	>35
148A, 148B, 148C2-Proctor	Silky dogwood, Amur honeysuckle, Amur privet, American cranberrybush.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Pin oak, eastern white pine.
149-Brenton	Silky dogwood, Amur honeysuckle, Amur privet, American cranberrybush.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
150B, 150C2-Onarga	Amur privet, Washington hawthorn, American cranberrybush, Amur honeysuckle.	Austrian pine, northern whitecedar, Osage-orange, eastern redcedar.	Red pine, Norway spruce, eastern white pine.	---
152-Drummer	American cranberrybush, Amur honeysuckle, silky dogwood, Amur privet.	Norway spruce, Washington hawthorn, white fir, blue spruce, northern whitecedar, Austrian pine.	Eastern white pine	Pin oak.
153-Pella	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern whitecedar, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.
154-Flanagan	Amur honeysuckle, silky dogwood, Amur privet, American cranberrybush.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
171B-Catlin	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, northern whitecedar, blue spruce, white fir.	Austrian pine, Norway spruce.	Pin oak, eastern white pine.
182-Peotone	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Norway spruce, Austrian pine, northern whitecedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
183-Shaffton	Amur honeysuckle, silky dogwood, Amur privet, American cranberrybush.	White fir, blue spruce, Austrian pine, northern whitecedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
194C2, 194D3-Morley	American cranberrybush, silky dogwood, Amur honeysuckle, arrowwood, Amur privet, Washington hawthorn, eastern redcedar.	Osage-orange, green ash, Austrian pine.	Pin oak, eastern white pine.	---

TABLE 9.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of-- 8-15	16-25	26-35	>35
194F, 194G: Morley	Amur honeysuckle, Washington hawthorn, eastern redcedar, Amur privet, arrowwood, American cranberrybush, silky dogwood.	Austrian pine, green ash, Osage-orange.	Eastern white pine, pin oak.	---
198: Elburn	Silky dogwood, Amur honeysuckle, Amur privet, American cranberrybush.	Austrian pine, white fir, northern whitecedar, Washington hawthorn, blue spruce.	Norway spruce	Eastern white pine, pin oak.
199B: Plano	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, northern whitecedar, blue spruce, white fir.	Austrian pine, Norway spruce.	Pin oak, eastern white pine.
221C3: Parr	Amur honeysuckle, American cranberrybush, Amur privet, silky dogwood.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
223B2, 223C2: Varna	Eastern redcedar, Washington hawthorn, Amur honeysuckle, Amur privet, arrowwood, silky dogwood, American cranberrybush.	Austrian pine, green ash, Osage-orange.	Eastern white pine, pin oak.	---
224G. Strawn				
230: Rowe	American cranberrybush, Amur honeysuckle, Amur privet, silky dogwood.	Blue spruce, Norway spruce, northern whitecedar, Austrian pine, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
232: Ashkum	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Austrian pine, northern whitecedar, Norway spruce, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
233B: Birkbeck	Silky dogwood, Amur honeysuckle, Amur privet, American cranberrybush.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Pin oak, eastern white pine.
235: Bryce	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern whitecedar, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.

TABLE 9.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of-- 8-15	16-25	26-35	>35
236 Sabina	Silky dogwood, Amur honeysuckle, Amur privet, American cranberrybush.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce	Pin oak, eastern white pine.
238 Rantoul	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern whitecedar, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.
241C Chatsworth	Eastern redcedar	Virginia pine, Austrian pine.	---	---
242 Kendall	Amur privet, silky dogwood, Amur honeysuckle, American cranberrybush.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
291B Xenia	Amur honeysuckle, American cranberrybush, Amur privet, silky dogwood.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
293 Andres	Amur honeysuckle, Amur privet, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
294B Symerton	Silky dogwood, Amur honeysuckle, Amur privet, American cranberrybush.	Northern whitecedar, blue spruce, white fir, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
295 Mokena	Silky dogwood, Amur honeysuckle, Amur privet, American cranberrybush.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce	Pin oak, eastern white pine.
302 Ambraw	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Norway spruce, Austrian pine, northern whitecedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
330 Peotone	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Norway spruce, Austrian pine, northern whitecedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
362 Whitaker Variant	Amur honeysuckle, American cranberrybush, Amur privet, silky dogwood.	White fir, Austrian pine, blue spruce, Washington hawthorn, northern whitecedar.	Norway spruce	Eastern white pine, pin oak.

TABLE 9.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of-- 8-15	16-25	26-35	>35
387B: Ockley	Amur honeysuckle, American cranberrybush, Amur privet, silky dogwood.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
398: Wea	Amur honeysuckle, American cranberrybush, Amur privet, silky dogwood.	White fir, northern whitecedar, blue spruce, Washington hawthorn.	Norway spruce, Austrian pine.	Pin oak, eastern white pine.
430: Raddle	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
440A, 440B, 440C2: Jasper	Amur honeysuckle, American cranberrybush, Amur privet, silky dogwood.	White fir, northern whitecedar, blue spruce, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
448B: Mona	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, Washington hawthorn, northern whitecedar.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
473: Rossburg	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, northern whitecedar, blue spruce, white fir, Austrian pine.	Norway spruce	Pin oak, eastern white pine.
481: Raub	Amur honeysuckle, American cranberrybush, Amur privet, silky dogwood.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
490: Odell	Amur honeysuckle, American cranberrybush, Amur privet, silky dogwood.	White fir, Austrian pine, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
495B2: Corwin	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
496A, 496B2: Fincastle	Amur honeysuckle, American cranberrybush, Amur privet, silky dogwood.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
533. Urban land				

TABLE 9.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of-- 8-15	16-25	26-35	>35
536. Dumps				
549G. Marseilles	Lilac, Amur honeysuckle, autumn-olive, Washington hawthorn, eastern redcedar, radiant crabapple.	Eastern white pine, jack pine, red pine, Austrian pine.	---	---
570B, 570C2, 570F. Martinsville	Amur honeysuckle, American cranberrybush, Amur privet, silky dogwood.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
571. Whitaker	Amur honeysuckle, American cranberrybush, Amur privet, silky dogwood.	White fir, Austrian pine, blue spruce, Washington hawthorn, northern whitecedar.	Norway spruce	Eastern white pine, pin oak.
802B, 802F. Orthents				
864, 865. Pits				
871B, 871G3. Lenzburg	Eastern redcedar, jack pine, Russian-olive, Washington hawthorn, Osage-orange.	Honeylocust, northern catalpa.	---	---
2023B:				
Blount	American cranberrybush, Amur honeysuckle, arrowwood, Amur privet, Washington hawthorn, eastern redcedar, silky dogwood.	Osage-orange, green ash, Austrian pine.	Eastern white pine, pin oak.	---
Urban land.				
2146A:				
Elliott	Silky dogwood, Amur honeysuckle, Amur privet, American cranberrybush.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
Urban land.				
2152:				
Drummer	American cranberrybush, Amur honeysuckle, silky dogwood, Amur privet.	Norway spruce, Washington hawthorn, white fir, blue spruce, northern whitecedar, Austrian pine.	Eastern white pine	Pin oak.

TABLE 9.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--			
	8-15	16-25	26-35	>35
2152:				
Urban land.				
2232:				
Ashkum	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Austrian pine, northern whitecedar, Norway spruce, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
Urban land.				
2242A:				
Kendall	Amur privet, silky dogwood, Amur honeysuckle, American cranberrybush.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
Urban land.				
2291B:				
Xenia	Amur honeysuckle, American cranberrybush, Amur privet, silky dogwood.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
Urban land.				
2570B:				
Martinsville	Amur honeysuckle, American cranberrybush, Amur privet, silky dogwood.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
Urban land.				
7304A, 8304 Landes	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.

TABLE 10.--RECREATIONAL DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
17 Keomah	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Slight	Slight.
23A, 23B2 Blount	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
27C3 Miami	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
27F Miami	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
43 Ipava	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
56B2 Dana	Slight	Slight	Moderate: slope.	Slight	Slight.
59 Lisbon	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
67 Harpster	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
68 Sable	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
69 Milford	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
88B Sparta	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, small stones.	Moderate: too sandy.	Moderate: droughty.
91A, 91B2 Swygert	Severe: wetness, percs slowly.	Severe: percs slowly.	Severe: wetness, percs slowly.	Moderate: wetness.	Moderate: wetness, droughty.
91C2 Swygert	Severe: wetness, percs slowly.	Severe: percs slowly.	Severe: slope, wetness, percs slowly.	Moderate: wetness.	Moderate: wetness, droughty.
102 La Hogue	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
107 Sawmill	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
125 Selma	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
131B------------------ Alvin	Slight----------	Slight----------	Moderate: slope.	Slight----------	Moderate: droughty.
132------------------- Starks	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
134B------------------ Camden	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
145B2----------------- Saybrook	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
146A, 146B2----------- Elliott	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
147A------------------ Clarence	Severe: wetness, percs slowly.	Severe: percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
147B2----------------- Clarence	Severe: wetness, percs slowly, too clayey.	Severe: too clayey, percs slowly.	Severe: too clayey, wetness.	Severe: too clayey.	Severe: too clayey.
148A------------------ Proctor	Slight----------	Slight----------	Slight----------	Slight----------	Slight.
148B------------------ Proctor	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
148C2----------------- Proctor	Slight----------	Slight----------	Severe: slope.	Slight----------	Slight.
149------------------- Brenton	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
150B------------------ Onarga	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
150C2----------------- Onarga	Slight----------	Slight----------	Severe: slope.	Slight----------	Slight.
152------------------- Drummer	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
153------------------- Pella	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
154------------------- Flanagan	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
171B------------------ Catlin	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
182------------------- Peotone	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
183------------------- Shaffton	Severe: flooding.	Moderate: flooding, wetness.	Severe: flooding.	Moderate: flooding.	Severe: flooding.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
194C2 Morley	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Slight	Slight.
194D3 Morley	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
194F, 194G Morley	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
198 Elburn	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
199B Plano	Slight	Slight	Moderate: slope.	Slight	Slight.
221C3 Parr	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight	Moderate: slope.
223B2 Varna	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight	Slight.
223C2 Varna	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Slight	Slight.
224G Strawn	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
230 Rowe	Severe: ponding, percs slowly, too clayey.	Severe: ponding, too clayey, percs slowly.	Severe: too clayey, ponding, percs slowly.	Severe: ponding, too clayey.	Severe: ponding, too clayey.
232 Ashkum	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
233B Birkbeck	Slight	Slight	Moderate: slope.	Severe: erodes easily.	Slight.
235 Bryce	Severe: ponding, too clayey.	Severe: ponding, too clayey.	Severe: too clayey, ponding.	Severe: ponding, too clayey.	Severe: ponding, too clayey.
236 Sabina	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
238 Rantoul	Severe: ponding, percs slowly, too clayey.	Severe: ponding, too clayey, percs slowly.	Severe: too clayey, ponding, percs slowly.	Severe: ponding, too clayey.	Severe: ponding, too clayey.
241C Chatsworth	Severe: percs slowly, too clayey.	Severe: too clayey, percs slowly.	Severe: slope, too clayey, percs slowly.	Severe: too clayey.	Severe: droughty, too clayey.
242 Kendall	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
291B------------------ Xenia	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: erodes easily.	Slight.
293------------------- Andres	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
294B------------------ Symerton	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight----------	Slight.
295------------------- Mokena	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
302------------------- Ambraw	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
330------------------- Peotone	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
362------------------- Whitaker Variant	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
387B------------------ Ockley	Slight----------	Slight----------	Moderate: slope, small stones.	Slight----------	Slight.
398------------------- Wea	Slight----------	Slight----------	Slight----------	Slight----------	Slight.
430------------------- Raddle	Severe: flooding.	Slight----------	Slight----------	Slight----------	Slight.
440A------------------ Jasper	Slight----------	Slight----------	Slight----------	Slight----------	Slight.
440B------------------ Jasper	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
440C2----------------- Jasper	Slight----------	Slight----------	Severe: slope.	Slight----------	Slight.
448B------------------ Mona	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight----------	Slight.
473------------------- Rossburg	Severe: flooding.	Slight----------	Slight----------	Slight----------	Slight.
481------------------- Raub	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
490------------------- Odell	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
495B2 Corwin	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight	Slight.
496A, 496B2 Fincastle	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
533. Urban land					
536. Dumps					
549G Marseilles	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
570B Martinsville	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
570C2 Martinsville	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
570F Martinsville	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
571 Whitaker	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
802B, 802F. Orthents					
864, 865. Pits					
871B Lenzburg	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones, percs slowly.	Severe: erodes easily.	Moderate: large stones.
871G3 Lenzburg	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
2023B:					
Blount	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
Urban land.					
2146A:					
Elliott	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
Urban land.					

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
2152:					
Drummer	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
Urban land.					
2232:					
Ashkum	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
Urban land.					
2242A:					
Kendall	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
Urban land.					
2291B:					
Xenia	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: erodes easily.	Slight.
Urban land.					
2570B:					
Martinsville	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
Urban land.					
7304A Landes	Severe: flooding.	Slight	Slight	Slight	Moderate: small stones.
8304 Landes	Severe: flooding.	Slight	Slight	Slight	Moderate: small stones.

TABLE 11.--WILDLIFE HABITAT

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

Soil name and map symbol	Potential for habitat elements						Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba-ceous plants	Hardwood trees	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
17----------------- Keomah	Good	Good	Fair	Fair	Fair	Fair	Good	Fair	Fair.
23A---------------- Blount	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
23B2--------------- Blount	Fair	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
27C3--------------- Miami	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
27F---------------- Miami	Very poor	Poor	Good	Good	Very poor	Very poor	Poor	Good	Very poor.
43----------------- Ipava	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
56B2--------------- Dana	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
59----------------- Lisbon	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
67----------------- Harpster	Fair	Fair	Good	Fair	Good	Fair	Fair	Fair	Fair.
68----------------- Sable	Fair	Good	Good	Fair	Good	Good	Good	Fair	Good.
69----------------- Milford	Good	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
88B---------------- Sparta	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor.
91A, 91B2, 91C2---- Swygert	Fair	Good	Good	Good	Fair	Poor	Good	Good	Poor.
102---------------- La Hogue	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
107---------------- Sawmill	Poor	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
125---------------- Selma	Good	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
131B--------------- Alvin	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
132---------------- Starks	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
134B--------------- Camden	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.

TABLE 11.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements						Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hardwood trees	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
145B2 Saybrook	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
146A Elliott	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
146B2 Elliott	Fair	Good	Good	Good	Poor	Poor	Good	Good	Poor.
147A Clarence	Fair	Good	Fair	Good	Fair	Fair	Fair	Good	Fair.
147B2 Clarence	Fair	Fair	Poor	Fair	Poor	Very poor	Fair	Fair	Very poor.
148A, 148B, 148C2 Proctor	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
149 Brenton	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
150B Onarga	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
150C2 Onarga	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
152 Drummer	Fair	Good	Good	Fair	Good	Good	Good	Fair	Good.
153 Pella	Good	Good	Good	Fair	Good	Good	Good	Fair	Good.
154 Flanagan	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
171B Catlin	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
182 Peotone	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
183 Shaffton	Very poor	Very poor	Very poor	Very poor	Good	Good	Very poor	Very poor	Good.
194C2, 194D3 Morley	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
194F, 194G Morley	Poor	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
198 Elburn	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
199B Plano	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
221C3 Parr	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
223B2 Varna	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.

TABLE 11.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements						Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hardwood trees	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
223C2 Varna	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
224G Strawn	Very poor	Poor	Good	Good	Very poor	Very poor	Poor	Good	Very poor.
230 Rowe	Poor	Fair	Poor	Fair	Poor	Good	Fair	Fair	Fair.
232 Ashkum	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
233B Birkbeck	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
235 Bryce	Good	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
236 Sabina	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
238 Rantoul	Good	Good	Good	Fair	Good	Good	Good	Fair	Good.
241C Chatsworth	Very poor	Poor	Poor	Very poor	Very poor	Very poor	Poor	Very poor	Very poor.
242 Kendall	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
291B Xenia	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
293 Andres	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
294B Symerton	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
295 Mokena	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
302 Ambraw	Good	Fair	Good	Good	Good	Good	Good	Good	Good.
330 Peotone	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
362 Whitaker Variant	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
387B Ockley	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
398 Wea	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
430 Raddle	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
440A, 440B Jasper	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.

TABLE 11.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements						Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba-ceous plants	Hardwood trees	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
440C2---------------- Jasper	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
448B---------------- Mona	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
473---------------- Rossburg	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
481---------------- Raub	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
490---------------- Odell	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
495B2---------------- Corwin	Good	Good	Good	Good	Poor	Fair	Good	Good	Poor.
496A---------------- Fincastle	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
496B2---------------- Fincastle	Fair	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
533. Urban land									
536. Dumps									
549G---------------- Marseilles	Very poor	Poor	Good	Good	Very poor	Very poor	Poor	Good	Very poor.
570B---------------- Martinsville	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
570C2---------------- Martinsville	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
570F---------------- Martinsville	Poor	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
571---------------- Whitaker	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
802B, 802F. Orthents									
864, 865. Pits									
871B---------------- Lenzburg	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
871G3---------------- Lenzburg	Very poor	Poor	Good	Good	Very poor	Very poor	Poor	Good	Very poor.
2023B:									
Blount------------	Fair	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.

TABLE 11.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
2023B:									
Urban land.									
2146A:									
Elliott	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Urban land.									
2152:									
Drummer	Fair	Good	Good	Fair	Good	Good	Good	Fair	Good.
Urban land.									
2232:									
Ashkum	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Urban land.									
2242A:									
Kendall	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Urban land.									
2291B:									
Xenia	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Urban land.									
2570B:									
Martinsville	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
Urban land.									
7304A, 8304 Landes	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.

TABLE 12.--BUILDING SITE DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
17---------------- Keomah	Severe: wetness.	Severe: shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength, frost action.	Slight.
23A, 23B2--------- Blount	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
27C3-------------- Miami	Moderate: slope, dense layer.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
27F--------------- Miami	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, low strength.	Severe: slope.
43---------------- Ipava	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, frost action, shrink-swell.	Moderate: wetness.
56B2-------------- Dana	Moderate: dense layer, wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
59---------------- Lisbon	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
67---------------- Harpster	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
68---------------- Sable	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
69---------------- Milford	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
88B--------------- Sparta	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: droughty.
91A, 91B2, 91C2--- Swygert	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength, frost action.	Moderate: wetness, droughty.
102--------------- La Hogue	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action.	Moderate: wetness.

TABLE 12.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
107--------------- Sawmill	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.
125--------------- Selma	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, frost action.	Severe: ponding.
131B-------------- Alvin	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Moderate: frost action.	Moderate: droughty.
132--------------- Starks	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
134B-------------- Camden	Slight---------	Moderate: shrink-swell.	Slight---------	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
145B2------------- Saybrook	Moderate: wetness.	Slight---------	Moderate: wetness.	Slight---------	Severe: low strength, frost action.	Slight.
146A, 146B2------- Elliott	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
147A-------------- Clarence	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength.	Moderate: wetness.
147B2------------- Clarence	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength.	Severe: too clayey.
148A, 148B-------- Proctor	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
148C2------------- Proctor	Severe: cutbanks cave.	Moderate: shrink-swell.	Slight---------	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
149--------------- Brenton	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
150B-------------- Onarga	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Moderate: frost action.	Slight.
150C2------------- Onarga	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Moderate: frost action.	Slight.
152--------------- Drummer	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
153--------------- Pella	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.

TABLE 12.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
154----------------- Flanagan	Severe: wetness.	Severe: shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell.	Severe: low strength, frost action, shrink-swell.	Moderate: wetness.
171B---------------- Catlin	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
182----------------- Peotone	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: ponding.
183----------------- Shaffton	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Severe: flooding.
194C2--------------- Morley	Moderate: too clayey, wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
194D3--------------- Morley	Moderate: too clayey, wetness, slope.	Moderate: shrink-swell, slope.	Moderate: wetness, slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
194F, 194G---------- Morley	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
198----------------- Elburn	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
199B---------------- Plano	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
221C3--------------- Parr	Moderate: dense layer, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: shrink-swell, low strength, slope.	Moderate: slope.
223B2--------------- Varna	Moderate: too clayey, wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
223C2--------------- Varna	Moderate: too clayey, wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
224G---------------- Strawn	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
230----------------- Rowe	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: low strength, ponding, shrink-swell.	Severe: ponding, too clayey.

TABLE 12.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
232 Ashkum	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
233B Birkbeck	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
235 Bryce	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: ponding, too clayey.
236 Sabina	Severe: wetness.	Severe: shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength, frost action.	Moderate: wetness.
238 Rantoul	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: low strength, ponding, shrink-swell.	Severe: ponding, too clayey.
241C Chatsworth	Moderate: too clayey, dense layer.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Severe: droughty, too clayey.
242 Kendall	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
291B Xenia	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: low strength, frost action.	Slight.
293 Andres	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
294B Symerton	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
295 Mokena	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
302 Ambraw	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.
330 Peotone	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: ponding.
362 Whitaker Variant	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.

TABLE 12.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
387B-------------- Ockley	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, low strength.	Slight.
398--------------- Wea	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
430--------------- Raddle	Slight---------	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: frost action.	Slight.
440A, 440B-------- Jasper	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Moderate: low strength, frost action.	Slight.
440C2------------- Jasper	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Moderate: low strength, frost action.	Slight.
448B-------------- Mona	Moderate: too clayey, wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
473--------------- Rossburg	Slight---------	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding, frost action.	Slight.
481--------------- Raub	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
490--------------- Odell	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action.	Moderate: wetness.
495B2------------- Corwin	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, low strength, wetness.	Slight.
496A, 496B2------- Fincastle	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
533. Urban land						
536. Dumps						
549G-------------- Marseilles	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope, frost action.	Severe: slope.
570B-------------- Martinsville	Severe: cutbanks cave.	Moderate: shrink-swell.	Slight---------	Moderate: shrink-swell.	Moderate: frost action, shrink-swell.	Slight.
570C2------------- Martinsville	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.

TABLE 12.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
570F-------------- Martinsville	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
571--------------- Whitaker	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action.	Moderate: wetness.
802B, 802F. Orthents						
864, 865. Pits						
871B-------------- Lenzburg	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Moderate: large stones.
871G3------------- Lenzburg	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
2023B:						
Blount-----------	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
Urban land.						
2146A:						
Elliott----------	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
Urban land.						
2152:						
Drummer----------	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
Urban land.						
2232:						
Ashkum-----------	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
Urban land.						
2242A:						
Kendall----------	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
Urban land.						

TABLE 12.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
2291B:						
Xenia------------	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: low strength, frost action.	Slight.
Urban land.						
2570B:						
Martinsville-----	Severe: cutbanks cave.	Moderate: shrink-swell.	Slight---------	Moderate: shrink-swell.	Moderate: frost action, shrink-swell.	Slight.
Urban land.						
7304A------------- Landes	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding, frost action.	Moderate: small stones.
8304-------------- Landes	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: small stones.

TABLE 13.--SANITARY FACILITIES

(Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
17 Keomah	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
23A, 23B2 Blount	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
27C3 Miami	Severe: percs slowly.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
27F Miami	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
43 Ipava	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
56B2 Dana	Severe: wetness, percs slowly.	Severe: wetness.	Moderate: wetness, too clayey.	Slight	Fair: too clayey, wetness.
59 Lisbon	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
67 Harpster	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
68 Sable	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: hard to pack, ponding.
69 Milford	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
88B Sparta	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
91A Swygert	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
91B2, 91C2 Swygert	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
102 La Hogue	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: wetness.

TABLE 13.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
107----------------- Sawmill	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
125----------------- Selma	Severe: ponding.	Severe: seepage, ponding.	Severe: seepage, ponding.	Severe: ponding.	Poor: ponding.
131B---------------- Alvin	Moderate: percs slowly.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage.
132----------------- Starks	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
134B---------------- Camden	Slight-----------	Moderate: seepage, slope.	Severe: seepage.	Slight-----------	Fair: too clayey.
145B2--------------- Saybrook	Moderate: wetness, percs slowly.	Moderate: seepage, slope, wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
146A, 146B2--------- Elliott	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
147A---------------- Clarence	Severe: wetness, percs slowly.	Slight-----------	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
147B2--------------- Clarence	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
148A, 148B---------- Proctor	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: wetness.	Fair: too clayey, wetness.
148C2--------------- Proctor	Moderate: percs slowly.	Severe: seepage.	Severe: seepage, too sandy.	Slight-----------	Poor: too sandy.
149----------------- Brenton	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
150B, 150C2--------- Onarga	Severe: poor filter.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: thin layer.
152----------------- Drummer	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
153----------------- Pella	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
154----------------- Flanagan	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: hard to pack.

TABLE 13.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
171B----------------- Catlin	Severe: wetness.	Moderate: seepage, slope, wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
182------------------ Peotone	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
183------------------ Shaffton	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: thin layer.
194C2---------------- Morley	Severe: wetness, percs slowly.	Severe: slope.	Moderate: wetness, too clayey.	Slight-----------	Fair: too clayey, wetness.
194D3---------------- Morley	Severe: wetness, percs slowly.	Severe: slope.	Moderate: wetness, slope, too clayey.	Moderate: slope.	Fair: too clayey, slope, wetness.
194F, 194G----------- Morley	Severe: percs slowly, slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: slope, too clayey, hard to pack.
198------------------ Elburn	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: wetness.	Poor: wetness.
199B----------------- Plano	Slight-----------	Moderate: seepage, slope.	Moderate: too clayey.	Slight-----------	Fair: too clayey.
221C3---------------- Parr	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
223B2, 223C2--------- Varna	Severe: wetness, percs slowly.	Severe: wetness.	Severe: too clayey.	Slight-----------	Poor: too clayey, hard to pack.
224G----------------- Strawn	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
230------------------ Rowe	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
232------------------ Ashkum	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, ponding.
233B----------------- Birkbeck	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.

TABLE 13.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
235------------------ Bryce	Severe: ponding, percs slowly.	Slight-----------	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
236------------------ Sabina	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
238------------------ Rantoul	Severe: ponding, percs slowly.	Slight-----------	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
241C----------------- Chatsworth	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Slight-----------	Poor: too clayey, hard to pack.
242------------------ Kendall	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
291B----------------- Xenia	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
293------------------ Andres	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
294B----------------- Symerton	Severe: wetness, percs slowly.	Moderate: seepage, slope, wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
295------------------ Mokena	Severe: wetness, percs slowly.	Slight-----------	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
302------------------ Ambraw	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
330------------------ Peotone	Severe: ponding, percs slowly.	Slight-----------	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
362------------------ Whitaker Variant	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness, thin layer.
387B----------------- Ockley	Slight-----------	Severe: seepage.	Severe: seepage.	Slight-----------	Poor: small stones.
398------------------ Wea	Slight-----------	Severe: seepage.	Severe: seepage.	Slight-----------	Poor: small stones.
430------------------ Raddle	Moderate: flooding.	Moderate: seepage.	Moderate: flooding.	Moderate: flooding.	Good.

TABLE 13.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
440A---------------- Jasper	Slight-----------	Moderate: seepage.	Moderate: too clayey.	Slight-----------	Fair: too clayey, thin layer.
440B---------------- Jasper	Slight-----------	Moderate: seepage, slope.	Moderate: too clayey.	Slight-----------	Fair: too clayey, thin layer.
440C2--------------- Jasper	Slight-----------	Severe: slope.	Moderate: too clayey.	Slight-----------	Fair: too clayey, thin layer.
448B---------------- Mona	Severe: wetness, percs slowly.	Moderate: slope.	Moderate: wetness, too clayey.	Moderate: wetness.	Poor: thin layer.
473----------------- Rossburg	Moderate: flooding.	Severe: seepage.	Severe: seepage.	Moderate: flooding.	Good.
481----------------- Raub	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: hard to pack, wetness.
490----------------- Odell	Severe: wetness, percs slowly.	Slight-----------	Severe: wetness.	Severe: wetness.	Poor: wetness.
495B2--------------- Corwin	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness.
496A, 496B2--------- Fincastle	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
533. Urban land					
536. Dumps					
549G---------------- Marseilles	Severe: thin layer, seepage, percs slowly.	Severe: seepage, slope.	Severe: seepage, slope, too clayey.	Severe: slope.	Poor: area reclaim, too clayey, hard to pack.
570B---------------- Martinsville	Slight-----------	Severe: seepage.	Severe: seepage.	Slight-----------	Fair: thin layer.
570C2--------------- Martinsville	Moderate: percs slowly, slope.	Severe: seepage, slope.	Severe: seepage.	Moderate: slope.	Fair: slope, thin layer.
570F---------------- Martinsville	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: slope.	Poor: slope.
571----------------- Whitaker	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: wetness.	Poor: wetness.

TABLE 13.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
802B, 802F. Orthents					
864, 865. Pits					
871B---------------- Lenzburg	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight-----------	Fair: too clayey, small stones.
871G3--------------- Lenzburg	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
2023B: Blount-------------	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Urban land.					
2146A: Elliott------------	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Urban land.					
2152: Drummer------------	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
Urban land.					
2232: Ashkum-------------	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, ponding.
Urban land.					
2242A: Kendall------------	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Urban land.					
2291B: Xenia--------------	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
Urban land.					
2570B: Martinsville-------	Slight-----------	Severe: seepage.	Severe: seepage.	Slight-----------	Fair: thin layer.
Urban land.					

TABLE 13.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
7304A--------------- Landes	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
8304---------------- Landes	Severe: flooding, poor filter.	Severe: seepage, flooding.	Severe: flooding, seepage, too sandy.	Severe: flooding, seepage.	Poor: seepage, too sandy.

TABLE 14.--CONSTRUCTION MATERIALS

(Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
17-------------------- Keomah	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
23A, 23B2------------- Blount	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
27C3------------------ Miami	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, slope, too clayey.
27F------------------- Miami	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
43-------------------- Ipava	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
56B2------------------ Dana	Good-----------------	Improbable: excess fines.	Improbable: excess fines.	Good.
59-------------------- Lisbon	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
67-------------------- Harpster	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
68-------------------- Sable	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
69-------------------- Milford	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
88B------------------- Sparta	Good-----------------	Probable-------------	Improbable: too sandy.	Poor: too sandy.
91A, 91B2, 91C2------- Swygert	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
102------------------- La Hogue	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
107------------------- Sawmill	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
125------------------- Selma	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
131B------------------ Alvin	Good-----------------	Probable-------------	Improbable: too sandy.	Poor: too sandy.
132------------------- Starks	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.

TABLE 14.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
134B------------------ Camden	Good-----------------	Improbable: excess fines.	Improbable: excess fines.	Good.
145B2----------------- Saybrook	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
146A, 146B2----------- Elliott	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
147A, 147B2----------- Clarence	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
148A, 148B------------ Proctor	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
148C2----------------- Proctor	Good-----------------	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
149------------------- Brenton	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
150B, 150C2----------- Onarga	Good-----------------	Probable-------------	Improbable: too sandy.	Fair: area reclaim, thin layer.
152------------------- Drummer	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
153------------------- Pella	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
154------------------- Flanagan	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
171B------------------ Catlin	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
182------------------- Peotone	Poor: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
183------------------- Shaffton	Fair: wetness.	Probable-------------	Improbable: too sandy.	Good.
194C2, 194D3---------- Morley	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
194F, 194G------------ Morley	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, slope.
198------------------- Elburn	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
199B------------------ Plano	Good-----------------	Improbable: excess fines.	Improbable: excess fines.	Good.

TABLE 14.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
221C3: Parr	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, too clayey, slope.
223B2, 223C2: Varna	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
224G: Strawn	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
230: Rowe	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
232: Ashkum	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
233B: Birkbeck	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
235: Bryce	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
236: Sabina	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
238: Rantoul	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
241C: Chatsworth	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
242: Kendall	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
291B: Xenia	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
293: Andres	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
294B: Symerton	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
295: Mokena	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, thin layer.
302: Ambraw	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
330: Peotone	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.

TABLE 14.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
362 Whitaker Variant	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
387B Ockley	Good	Probable	Probable	Poor: small stones, area reclaim.
398 Wea	Good	Probable	Probable	Poor: small stones, area reclaim.
430 Raddle	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
440A, 440B, 440C2 Jasper	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
448B Mona	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, thin layer.
473 Rossburg	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
481 Raub	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
490 Odell	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, too clayey, small stones.
495B2 Corwin	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, small stones.
496A, 496B2 Fincastle	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
533. Urban land				
536. Dumps				
549G Marseilles	Poor: area reclaim, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, slope.
570B Martinsville	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
570C2 Martinsville	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.

TABLE 14.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
570F------------------ Martinsville	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
571------------------- Whitaker	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
802B, 802F. Orthents				
864, 865. Pits				
871B------------------ Lenzburg	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
871G3----------------- Lenzburg	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
2023B:				
Blount---------------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Urban land.				
2146A:				
Elliott--------------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Urban land.				
2152:				
Drummer--------------	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Urban land.				
2232:				
Ashkum---------------	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Urban land.				
2242A:				
Kendall--------------	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
Urban land.				
2291B:				
Xenia----------------	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Urban land.				
2570B:				
Martinsville---------	Good-----------------	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.

TABLE 14.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
2570B: Urban land.				
7304A, 8304 Landes	Good	Probable	Improbable: too sandy.	Fair: too sandy, small stones, thin layer.

TABLE 15.--WATER MANAGEMENT

(Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
17 Keomah	Slight	Severe: hard to pack.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Erodes easily, percs slowly.
23A Blount	Slight	Moderate: piping, wetness.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, rooting depth.
23B2 Blount	Moderate: slope.	Moderate: piping, wetness.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, rooting depth.
27C3, 27F Miami	Severe: slope.	Severe: piping.	Deep to water	Slope, rooting depth.	Slope, erodes easily.	Slope, erodes easily, rooting depth.
43 Ipava	Slight	Severe: wetness.	Frost action	Wetness	Erodes easily, wetness.	Wetness, erodes easily.
56B2 Dana	Moderate: seepage, slope.	Moderate: thin layer.	Deep to water	Slope	Erodes easily	Erodes easily.
59 Lisbon	Moderate: seepage.	Severe: wetness.	Frost action	Wetness	Erodes easily, wetness.	Wetness, erodes easily.
67 Harpster	Moderate: seepage.	Severe: ponding, piping.	Ponding, frost action.	Ponding	Ponding	Wetness.
68 Sable	Moderate: seepage.	Severe: ponding.	Ponding, frost action.	Ponding	Ponding	Wetness.
69 Milford	Slight	Severe: ponding.	Ponding, frost action.	Ponding	Erodes easily, ponding.	Wetness, erodes easily.
88B Sparta	Severe: seepage.	Severe: seepage, piping.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.	Droughty.
91A Swygert	Slight	Moderate: hard to pack, wetness.	Percs slowly, frost action.	Wetness, droughty.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, droughty.
91B2, 91C2 Swygert	Moderate: slope.	Moderate: hard to pack, wetness.	Percs slowly, frost action, slope.	Slope, wetness, droughty.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, droughty.
102 La Hogue	Severe: seepage.	Severe: wetness, thin layer.	Frost action	Wetness	Wetness	Wetness.
107 Sawmill	Moderate: seepage.	Severe: wetness.	Flooding, frost action.	Wetness, flooding.	Wetness	Wetness.
125 Selma	Severe: seepage.	Severe: ponding.	Ponding, frost action.	Ponding	Ponding	Wetness.

TABLE 15.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
131B: Alvin	Severe: seepage.	Severe: seepage, piping.	Deep to water	Slope, droughty.	Soil blowing	Droughty, rooting depth
132: Starks	Moderate: seepage.	Severe: thin layer, wetness.	Frost action	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily
134B: Camden	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
145B2: Saybrook	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope	Erodes easily	Erodes easily.
146A: Elliott	Slight	Severe: wetness.	Percs slowly, frost action.	Wetness, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
146B2: Elliott	Moderate: slope.	Severe: wetness.	Percs slowly, frost action, slope.	Wetness, percs slowly, slope.	Wetness, percs slowly.	Wetness, percs slowly.
147A: Clarence	Slight	Moderate: hard to pack, wetness.	Percs slowly	Wetness	Erodes easily, wetness, percs slowly.	Wetness, erodes easily rooting depth
147B2: Clarence	Moderate: slope.	Moderate: hard to pack, wetness.	Percs slowly, slope.	Slope, wetness, droughty.	Wetness, percs slowly.	Wetness, rooting depth
148A: Proctor	Severe: seepage.	Moderate: thin layer, piping, wetness.	Frost action	Wetness	Erodes easily, wetness.	Erodes easily.
148B: Proctor	Severe: seepage.	Moderate: thin layer, piping, wetness.	Frost action, slope.	Slope, wetness.	Erodes easily, wetness.	Erodes easily.
148C2: Proctor	Severe: seepage.	Severe: piping.	Deep to water	Slope	Erodes easily, too sandy.	Erodes easily.
149: Brenton	Moderate: seepage.	Severe: wetness.	Frost action	Wetness	Wetness	Wetness.
150B, 150C2: Onarga	Severe: seepage.	Severe: piping.	Deep to water	Soil blowing, slope.	Soil blowing	Favorable.
152: Drummer	Moderate: seepage.	Severe: ponding.	Ponding, frost action.	Ponding	Ponding	Wetness.
153: Pella	Moderate: seepage.	Severe: piping, ponding.	Ponding, frost action.	Ponding	Ponding	Wetness.
154: Flanagan	Moderate: seepage.	Severe: wetness.	Frost action	Wetness	Erodes easily, wetness.	Erodes easily.
171B: Catlin	Moderate: seepage, slope.	Moderate: wetness.	Deep to water	Slope	Erodes easily	Erodes easily.

TABLE 15.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
182 Peotone	Severe: seepage.	Severe: ponding.	Ponding, percs slowly, frost action.	Ponding, percs slowly.	Ponding, percs slowly.	Wetness, percs slowly.
183 Shaffton	Severe: seepage.	Severe: piping.	Flooding	Wetness, flooding.	Erodes easily, wetness.	Erodes easily.
194C2 Morley	Moderate: slope.	Slight	Deep to water	Percs slowly, slope, rooting depth.	Erodes easily	Erodes easily, rooting depth.
194D3 Morley	Severe: slope.	Slight	Deep to water	Percs slowly, slope, rooting depth.	Slope, erodes easily.	Slope, erodes easily, rooting depth.
194F, 194G Morley	Severe: slope.	Moderate: hard to pack.	Deep to water	Slope, percs slowly.	Slope, erodes easily.	Slope, erodes easily, percs slowly.
198 Elburn	Moderate: seepage.	Severe: wetness.	Frost action	Wetness	Erodes easily, wetness.	Wetness, erodes easily.
199B Plano	Moderate: seepage, slope.	Moderate: thin layer, piping.	Deep to water	Slope	Erodes easily	Erodes easily.
221C3 Parr	Severe: slope.	Severe: thin layer.	Deep to water	Slope, percs slowly.	Slope	Slope, rooting depth, percs slowly.
223B2, 223C2 Varna	Moderate: slope.	Moderate: hard to pack.	Deep to water	Slope, percs slowly.	Erodes easily	Erodes easily.
224G Strawn	Severe: slope.	Moderate: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
230 Rowe	Slight	Severe: hard to pack, ponding.	Ponding, percs slowly.	Ponding, slow intake, percs slowly.	Ponding, percs slowly.	Wetness, percs slowly.
232 Ashkum	Slight	Severe: ponding.	Ponding, frost action.	Ponding	Ponding	Wetness.
233B Birkbeck	Moderate: seepage, slope.	Moderate: thin layer, piping, wetness.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
235 Bryce	Slight	Severe: ponding.	Ponding, percs slowly, frost action.	Ponding, slow intake, percs slowly.	Ponding, percs slowly.	Wetness, percs slowly.
236 Sabina	Slight	Severe: wetness.	Frost action	Wetness, erodes easily.	Erodes easily, wetness.	Erodes easily.
238 Rantoul	Slight	Severe: hard to pack, ponding.	Ponding, percs slowly.	Ponding, slow intake, percs slowly.	Ponding, percs slowly.	Wetness, percs slowly.
241C Chatsworth	Moderate: slope.	Moderate: hard to pack.	Deep to water	Slope, droughty, slow intake.	Percs slowly	Droughty.

TABLE 15.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
242: Kendall	Moderate: seepage.	Severe: wetness.	Frost action	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily
291B: Xenia	Moderate: seepage, slope.	Moderate: thin layer, wetness.	Frost action, slope.	Slope, wetness, erodes easily.	Erodes easily, wetness.	Erodes easily.
293: Andres	Moderate: seepage.	Severe: wetness.	Frost action	Wetness	Wetness, erodes easily.	Wetness, erodes easily
294B: Symerton	Moderate: seepage, slope.	Moderate: wetness.	Deep to water	Slope	Erodes easily	Erodes easily.
295: Mokena	Slight	Moderate: hard to pack, wetness.	Percs slowly, frost action.	Wetness, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
302: Ambraw	Moderate: seepage.	Severe: wetness, piping.	Flooding, frost action.	Wetness, flooding.	Wetness, erodes easily.	Wetness, erodes easily
330: Peotone	Slight	Severe: ponding.	Ponding, frost action.	Ponding	Ponding	Wetness.
362: Whitaker Variant	Moderate: seepage.	Severe: wetness.	Frost action	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily
387B: Ockley	Severe: seepage.	Moderate: thin layer, piping.	Deep to water	Favorable	Erodes easily	Erodes easily.
398: Wea	Severe: seepage.	Moderate: thin layer, piping.	Deep to water	Favorable	Favorable	Favorable.
430: Raddle	Moderate: seepage.	Severe: piping.	Deep to water	Favorable	Erodes easily	Erodes easily.
440A: Jasper	Moderate: seepage.	Moderate: thin layer, piping.	Deep to water	Favorable	Favorable	Favorable.
440B, 440C2: Jasper	Moderate: seepage, slope.	Moderate: thin layer, piping.	Deep to water	Slope	Favorable	Favorable.
448B: Mona	Moderate: slope.	Moderate: piping, wetness.	Percs slowly, slope.	Slope, wetness, percs slowly.	Wetness	Percs slowly.
473: Rossburg	Severe: seepage.	Severe: piping.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
481: Raub	Slight	Severe: wetness.	Frost action	Wetness	Erodes easily, wetness.	Wetness, erodes easily
490: Odell	Moderate: seepage.	Severe: piping, wetness.	Frost action, percs slowly.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, rooting depth

TABLE 15.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
495B2 Corwin	Moderate: seepage, slope.	Severe: piping.	Slope	Wetness, rooting depth, slope.	Erodes easily, wetness.	Erodes easily, rooting depth.
496A Fincastle	Moderate: seepage.	Severe: wetness.	Frost action	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
496B2 Fincastle	Moderate: seepage, slope.	Severe: wetness.	Frost action, slope.	Wetness, slope, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
533. Urban land						
536. Dumps						
549G Marseilles	Severe: slope.	Severe: thin layer.	Deep to water	Percs slowly, slope, thin layer.	Slope, area reclaim, erodes easily.	Slope, erodes easily, area reclaim.
570B Martinsville	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope	Erodes easily	Erodes easily.
570C2 Martinsville	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope	Slope, erodes easily.	Slope, erodes easily.
570F Martinsville	Severe: slope.	Severe: piping.	Deep to water	Soil blowing, slope.	Slope, erodes easily, soil blowing.	Slope, erodes easily.
571 Whitaker	Moderate: seepage.	Severe: wetness, piping.	Frost action	Wetness	Erodes easily, wetness.	Wetness, erodes easily.
802B, 802F. Orthents						
864, 865. Pits						
871B Lenzburg	Moderate: slope.	Moderate: piping.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
871G3 Lenzburg	Severe: slope.	Moderate: piping.	Deep to water	Slope	Slope, erodes easily.	Slope, erodes easily.
2023B: Blount	Moderate: slope.	Moderate: piping, wetness.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, rooting depth.
Urban land.						
2146A: Elliott	Slight	Severe: wetness.	Percs slowly, frost action.	Wetness, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
Urban land.						

TABLE 15.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
2152:						
Drummer	Moderate: seepage.	Severe: ponding.	Ponding, frost action.	Ponding	Ponding	Wetness.
Urban land.						
2232:						
Ashkum	Slight	Severe: ponding.	Ponding, frost action.	Ponding	Ponding	Wetness.
Urban land.						
2242A:						
Kendall	Moderate: seepage.	Severe: wetness.	Frost action	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily
Urban land.						
2291B:						
Xenia	Moderate: seepage, slope.	Moderate: thin layer, wetness.	Frost action, slope.	Slope, wetness, erodes easily.	Erodes easily, wetness.	Erodes easily.
Urban land.						
2570B:						
Martinsville	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope	Erodes easily	Erodes easily.
Urban land.						
7304A, 8304 Landes	Severe: seepage.	Severe: seepage, piping.	Deep to water	Favorable	Too sandy, soil blowing.	Favorable.

TABLE 16.--ENGINEERING INDEX PROPERTIES

(The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated)

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
17---------------- Keomah	0-14	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	100	95-100	25-35	5-15
	14-32	Silty clay loam, silty clay.	CH, CL	A-7	0	100	100	100	95-100	45-60	30-45
	32-62	Silty clay loam, silt loam.	CL	A-7, A-6	0	100	100	100	95-100	35-50	15-30
23A, 23B2--------- Blount	0-11	Silt loam--------	CL	A-6, A-4	0-5	95-100	95-100	90-100	80-95	25-40	8-20
	11-34	Silty clay loam, silty clay, clay loam.	CH, CL	A-7, A-6	0-5	95-100	90-100	80-90	75-85	35-60	15-35
	34-40	Silty clay loam, clay loam.	CL, CH, ML, MH	A-6, A-7	0-5	95-100	90-100	80-90	70-90	35-55	10-30
	40-60	Silty clay loam, clay loam.	CL	A-6, A-7	0-10	90-100	90-100	80-100	70-90	30-45	10-25
27C3-------------- Miami	0-11	Silt loam--------	CL, CL-ML, ML	A-4	0	100	95-100	80-100	50-90	15-30	3-10
	11-33	Clay loam, silty clay loam.	CL, SC	A-6	0	90-100	85-100	70-95	40-95	30-40	15-25
	33-38	Loam-------------	CL, SC	A-4, A-6	0-3	85-100	85-100	70-90	40-90	25-35	8-15
	38-60	Loam-------------	CL, CL-ML, SC, SM-SC	A-4, A-6	0-3	85-100	85-100	70-90	45-70	20-40	5-20
27F--------------- Miami	0-11	Loam-------------	CL, CL-ML, ML	A-4	0	100	95-100	80-100	50-90	15-30	3-10
	11-33	Clay loam, silty clay loam.	CL, SC	A-6	0	90-100	85-100	70-95	40-95	30-40	15-25
	33-38	Loam, clay loam	CL, SC	A-4, A-6	0-3	85-100	85-100	70-90	40-90	25-35	8-15
	38-60	Loam-------------	CL, CL-ML, SC, SM-SC	A-4, A-6	0-3	85-100	85-100	70-90	45-70	20-40	5-20
43---------------- Ipava	0-14	Silt loam--------	ML, CL	A-6	0	100	100	95-100	90-100	25-40	10-20
	14-46	Silty clay loam, silty clay.	CH, CL	A-7	0	100	100	95-100	90-100	45-70	25-40
	46-60	Silt loam--------	CL, CL-ML	A-6, A-4	0	100	100	95-100	90-100	25-40	5-20
56B2-------------- Dana	0-7	Silt loam--------	CL	A-6, A-4	0	100	100	95-100	85-95	30-35	8-12
	7-29	Silty clay loam	CL	A-6, A-7	0	100	100	95-100	85-98	38-50	20-32
	29-39	Clay loam--------	CL	A-6, A-7	0	90-100	90-95	80-90	65-75	37-50	17-30
	39-60	Loam-------------	CL, ML, CL-ML	A-4, A-6	0-3	85-95	80-90	75-85	50-65	17-30	2-14
59---------------- Lisbon	0-11	Silt loam--------	ML	A-6, A-7	0	100	100	95-100	80-95	35-50	10-20
	11-25	Silty clay loam, silt loam.	CL, CH	A-7, A-6	0	100	95-100	95-100	80-98	35-55	15-35
	25-39	Loam, clay loam, silty clay loam.	CL	A-4, A-6, A-7	0-5	90-100	90-100	85-100	70-85	20-45	8-25
	39-60	Loam, silt loam	CL	A-6, A-4	0-3	90-100	90-100	85-100	70-85	20-40	8-20
67---------------- Harpster	0-12	Silty clay loam	CL, CH	A-7	0	100	95-100	95-100	90-100	45-60	20-35
	12-35	Silty clay loam	CL, CH	A-7	0	100	95-100	95-100	85-100	40-60	20-35
	35-41	Silty clay loam, silt loam, loam.	CL, CH	A-6, A-7	0	100	95-100	95-100	70-100	35-55	20-35
	41-60	Stratified sandy loam to clay loam.	CL, CL-ML, SC, SM-SC	A-4, A-6, A-7	0	100	95-100	95-100	45-95	20-50	5-25

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
68---------------- Sable	0-14	Silty clay loam	CL, CH, ML, MH	A-7	0	100	100	95-100	95-100	41-65	15-35
	14-48	Silty clay loam, silt loam.	CL, CH	A-7	0	100	100	95-100	95-100	40-55	20-35
	48-70	Silt loam, silty clay loam.	CL	A-6	0	100	100	95-100	95-100	30-40	10-20
69---------------- Milford	0-18	Silty clay loam	CL, CH	A-7	0	100	95-100	90-100	75-95	40-55	20-30
	18-52	Silty clay, silty clay loam, clay loam.	CH, CL	A-7	0	100	95-100	90-100	75-100	40-60	20-40
	52-60	Stratified clay to sandy loam.	CL, SC	A-6, A-7	0	95-100	95-100	90-100	45-100	25-50	10-30
88B--------------- Sparta	0-11	Loamy fine sand	SM	A-2, A-4	0	85-100	85-100	50-95	15-50	---	NP
	11-37	Loamy fine sand, fine sand, sand.	SP-SM, SM	A-2, A-3, A-4	0	85-100	85-100	50-95	5-50	---	NP
	37-60	Sand, fine sand	SP-SM, SM, SP	A-2, A-3	0	85-100	85-100	50-95	2-30	---	NP
91A--------------- Swygert	0-14	Silty clay loam	CL	A-7, A-6	0	100	95-100	95-100	85-95	35-50	15-25
	14-38	Silty clay, clay	CH	A-7	0-5	95-100	95-100	90-100	75-95	50-60	25-35
	38-60	Silty clay loam, silty clay, clay.	CH, CL	A-7	0-5	95-100	95-100	90-100	75-95	40-65	20-40
91B2, 91C2-------- Swygert	0-8	Silty clay loam	CL	A-7, A-6	0	100	95-100	95-100	85-95	35-50	15-25
	8-37	Silty clay, clay	CH	A-7	0-5	95-100	95-100	90-100	75-95	50-60	25-35
	37-60	Silty clay loam, silty clay, clay.	CH, CL	A-7	0-5	95-100	95-100	90-100	75-95	40-65	20-40
102--------------- La Hogue	0-12	Loam-------------	ML, CL, CL-ML	A-4	0	100	95-100	80-100	50-80	20-35	3-10
	12-39	Sandy clay loam, loam, silty clay loam, clay loam.	CL, SC	A-6, A-4	0	100	100	80-100	40-85	25-40	8-20
	39-60	Stratified sand to silt loam.	CL, ML, SC, SM	A-4, A-2	0	90-100	80-100	50-95	10-60	<25	NP-10
107--------------- Sawmill	0-26	Silty clay loam	CL	A-6, A-7	0	100	100	95-100	85-100	30-50	15-30
	26-45	Silty clay loam, clay loam, loam.	CL	A-6, A-7, A-4	0	100	100	85-100	70-95	25-50	8-25
	45-60	Silty clay loam, clay loam, silt loam.	CL	A-4, A-6, A-7	0	100	100	75-100	65-95	20-50	8-30
125--------------- Selma	0-22	Silt loam---------	CL	A-4, A-6	0	100	95-100	80-100	55-85	25-35	7-17
	22-43	Sandy loam, loam, silty clay loam.	CL, SC	A-6	0	100	95-100	80-95	38-85	24-36	11-19
	43-60	Stratified sand to silt loam.	SM-SC, SC, CL-ML, CL	A-2, A-4, A-6	0	90-100	85-100	60-90	30-70	15-35	5-20

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
131B------------- Alvin	0-8	Fine sandy loam	SM, ML	A-4, A-2	0	100	100	80-95	30-60	<25	NP-4
	8-11	Very fine sandy loam, sandy loam, loamy fine sand.	SM, ML	A-2, A-4	0	100	100	80-95	30-60	<25	NP-4
	11-25	Very fine sandy loam, sandy loam, loam.	SM, SC, CL, ML	A-2, A-4, A-6	0	100	100	70-100	20-80	15-40	NP-15
	25-60	Very fine sand, fine sandy loam, loamy fine sand.	SP, SP-SM, SM	A-2, A-3, A-1	0	95-100	90-100	45-95	4-35	<20	NP-4
132-------------- Starks	0-12	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-100	20-35	4-15
	12-26	Silty clay loam	CL	A-6, A-7	0	100	100	90-100	80-100	35-45	15-25
	26-47	Loam, silty clay loam, sandy loam.	CL, SC, CL-ML, SM-SC	A-4, A-6	0	95-100	90-100	80-95	40-80	25-40	6-17
	47-60	Stratified loamy sand to silt loam.	SM, SC, ML, CL	A-2, A-4, A-6	0-5	90-100	80-95	40-90	30-60	<30	NP-15
134B------------- Camden	0-10	Silt loam--------	CL, ML, CL-ML	A-4, A-6	0	100	100	95-100	90-100	20-35	3-15
	10-28	Silt loam, silty clay loam.	CL	A-6	0	100	100	95-100	90-100	25-40	15-25
	28-50	Clay loam, sandy loam, silt loam.	ML, SC, SM, CL	A-2, A-4, A-6	0-5	90-100	85-100	60-100	30-70	20-40	3-15
	50-60	Stratified sandy loam to silt loam.	SM, SC, ML, CL	A-2, A-4	0-5	90-100	80-100	50-80	20-60	<25	3-10
145B2------------ Saybrook	0-9	Silt loam--------	CL, CL-ML	A-6, A-4	0	100	100	95-100	90-100	25-40	5-15
	9-22	Silty clay loam, silt loam.	CL, CH	A-7, A-6	0	95-100	95-100	90-100	85-100	35-55	15-30
	22-60	Loam, silt loam, clay loam.	CL	A-6, A-4	0	95-100	85-100	80-95	60-85	20-40	8-25
146A------------- Elliott	0-12	Silt loam--------	CL	A-6, A-4	0	95-100	95-100	95-100	75-100	30-40	8-18
	12-40	Silty clay, silty clay loam, clay.	CH, CL	A-6, A-7	0-5	95-100	90-100	90-100	70-100	30-52	11-26
	40-60	Silty clay loam, clay loam, silt loam.	CL	A-6, A-7	0-5	90-100	85-100	80-100	70-95	28-45	11-24
146B2------------ Elliott	0-8	Silty clay loam	CL, ML	A-6, A-7	0	95-100	95-100	95-100	85-100	30-50	11-20
	8-27	Silty clay, silty clay loam, clay.	CH, CL	A-6, A-7	0-5	95-100	90-100	90-100	70-100	30-52	11-26
	27-60	Silty clay loam, clay loam, silt loam.	CL	A-6, A-7	0-5	90-100	85-100	80-100	70-95	28-45	11-24
147A------------- Clarence	0-12	Silty clay loam	CL	A-6, A-7	0	95-100	95-100	90-100	85-100	30-45	15-25
	12-38	Silty clay, clay	CH	A-7	0-5	95-100	95-100	90-100	85-100	50-65	25-40
	38-60	Silty clay, clay	CL, CH	A-7	0-5	95-100	95-100	90-100	85-100	45-65	25-40
147B2------------ Clarence	0-7	Silty clay-------	CL, CH	A-7	0	100	95-100	95-100	90-100	45-60	25-35
	7-32	Silty clay, clay	CH	A-7	0-5	95-100	95-100	90-100	85-100	50-65	25-40
	32-60	Silty clay, clay	CL, CH	A-7	0-5	95-100	95-100	90-100	85-100	45-65	25-40

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification Unified	Classification AASHTO	Frag- ments > 3 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
148A, 148B-------Proctor	0-12	Silt loam--------	CL	A-6	0	100	100	95-100	85-100	25-40	10-20
	12-25	Silty clay loam	CL	A-7, A-6	0	95-100	90-100	85-100	85-100	25-50	10-25
	25-38	Clay loam, sandy loam, silty clay loam.	CL, SC, CL-ML, SM-SC	A-6, A-7, A-4, A-2	0	90-100	85-100	75-100	30-80	20-45	5-25
	38-60	Stratified sand to sandy loam.	SC, CL, SM-SC, CL-ML	A-2, A-4, A-6	0	85-100	80-100	50-100	25-80	20-40	5-20
148C2------------Proctor	0-8	Silt loam--------	CL	A-6	0	100	100	95-100	85-100	25-40	10-20
	8-27	Silty clay loam	CL	A-7, A-6	0	95-100	90-100	85-100	85-100	25-50	10-25
	27-48	Clay loam, sandy loam, loam.	CL, SC, CL-ML, SM-SC	A-6, A-7, A-4, A-2	0	90-100	85-100	75-100	30-80	20-45	5-25
	48-60	Stratified loam to sand.	SC, CL, SM-SC, CL-ML	A-2, A-4, A-6	0	85-100	80-100	50-100	25-80	20-40	5-20
149--------------Brenton	0-12	Silt loam--------	CL, ML	A-6, A-4	0	100	95-100	95-100	85-100	30-40	8-15
	12-27	Silty clay loam, silt loam.	CL, ML	A-6, A-7	0	100	95-100	95-100	85-100	35-50	10-25
	27-35	Clay loam, loam, silt loam.	CL	A-6, A-7	0	100	95-100	90-100	75-95	30-45	10-20
	35-60	Stratified loamy sand to silty clay loam.	CL-ML, CL, SM-SC, SC	A-2, A-4, A-6	0	95-100	85-100	80-100	30-85	20-35	5-20
150B-------------Onarga	0-13	Sandy loam-------	SC, SM, SM-SC	A-4, A-6, A-2	0	100	100	75-95	25-50	<28	NP-12
	13-32	Loam, sandy clay loam, fine sandy loam.	SC, CL, SM-SC, CL-ML	A-4, A-6, A-2-4, A-2-6	0	95-100	95-100	75-95	30-60	19-32	5-14
	32-60	Stratified sand to sandy loam.	SM, SP-SM, SM-SC	A-2, A-4	0	85-100	80-100	70-95	12-50	<20	NP-6
150C2------------Onarga	0-13	Fine sandy loam	SC, SM, SM-SC	A-4, A-6, A-2	0	100	100	75-95	25-50	<28	NP-12
	13-32	Loam, sandy clay loam, fine sandy loam.	SC, CL, SM-SC, CL-ML	A-4, A-6, A-2-4, A-2-6	0	95-100	95-100	75-95	30-60	19-32	5-14
	32-60	Stratified sand to sandy loam.	SM, SP-SM, SM-SC	A-2, A-4	0	85-100	80-100	70-95	12-50	<20	NP-6
152--------------Drummer	0-13	Silty clay loam	CL	A-6, A-7	0	100	95-100	95-100	85-95	30-50	15-30
	13-47	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	95-100	95-100	85-95	30-50	15-30
	47-54	Loam, silt loam, clay loam.	CL	A-6, A-7	0-5	95-100	90-100	75-95	60-85	30-50	15-30
	54-60	Stratified loamy sand to silty clay loam.	SC, CL	A-4, A-6	0-5	95-100	85-95	75-95	45-80	20-35	7-20
153--------------Pella	0-12	Silty clay loam	CL	A-7	0	100	95-100	90-100	85-95	40-50	15-25
	12-28	Silty clay loam, silty clay, clay loam.	CL	A-6, A-7	0	100	95-100	90-100	85-95	30-50	15-30
	28-46	Stratified silty clay loam to sandy loam.	CL	A-6, A-7	0-5	95-100	90-100	85-95	60-90	25-45	10-25
	46-60	Stratified sandy loam to silty clay loam.	SM-SC, SC, CL, CL-ML	A-2, A-4, A-6	0-5	90-100	80-100	50-100	30-85	20-35	7-20

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
154-------------- Flanagan	0-16	Silt loam--------	CL	A-7, A-6	0	100	100	95-100	85-100	35-50	15-30
	16-45	Silty clay loam	CL, CH	A-7	0	100	100	95-100	85-100	40-60	15-30
	45-60	Loam, clay loam, silt loam.	CL, CL-ML	A-4, A-6, A-7	0	85-100	80-100	70-95	50-85	20-45	5-30
171B------------- Catlin	0-15	Silt loam--------	ML, CL, CL-ML	A-6, A-7, A-4	0	100	100	95-100	85-100	25-45	5-20
	15-53	Silty clay loam, silt loam.	CL, ML	A-7, A-6	0	100	90-100	90-100	80-100	30-50	15-30
	53-74	Loam, clay loam, silty clay loam.	CL	A-6, A-7	0	90-100	90-100	85-100	60-100	25-45	10-20
182-------------- Peotone	0-21	Mucky silty clay loam.	CL	A-7	0	100	95-100	90-100	80-95	40-50	15-25
	21-56	Mucky silty clay loam, mucky silty clay.	CL, CH	A-7	0	100	95-100	90-100	85-95	40-70	15-40
	56-64	Marl-------------	---	---	---	---	---	---	---	---	---
183-------------- Shaffton	0-13	Loam-------------	CL	A-6	0	100	100	85-95	60-70	30-40	11-20
	13-44	Loam-------------	CL, CL-ML	A-4, A-6	0	100	100	85-95	55-65	25-35	5-15
	44-60	Loamy sand, sandy loam.	SM, SM-SC, SP-SM	A-2	0	100	100	50-75	10-30	<15	NP-5
194C2------------ Morley	0-6	Silt loam--------	CL, CL-ML	A-6, A-4	0-5	95-100	95-100	90-100	75-95	25-40	5-15
	6-20	Silty clay, clay loam, clay.	CL, CH	A-7	0-10	95-100	90-100	85-95	80-90	40-60	15-35
	20-28	Silty clay loam, clay loam, silty clay.	CL, CH	A-6, A-7	0-10	95-100	90-100	85-95	80-90	30-60	15-35
	28-60	Silty clay loam, clay loam.	CL	A-6, A-7	0-10	95-100	90-100	85-95	80-90	30-50	15-30
194D3------------ Morley	0-3	Silt loam--------	CL, CL-ML	A-6, A-4	0-5	95-100	95-100	90-100	75-95	25-40	5-15
	3-20	Silty clay, clay loam, clay.	CL, CH	A-7	0-10	95-100	90-100	85-95	80-90	40-60	15-35
	20-25	Silty clay loam, clay loam, silty clay.	CL, CH	A-6, A-7	0-10	95-100	90-100	85-95	80-90	30-60	15-35
	25-60	Silty clay loam, clay loam.	CL	A-6, A-7	0-10	95-100	90-100	85-95	80-90	30-50	15-30
194F, 194G------- Morley	0-9	Silt loam--------	CL, CL-ML	A-6, A-4	0-5	95-100	95-100	90-100	75-95	25-40	5-15
	9-34	Silty clay loam, silty clay, clay.	CL, CH	A-6, A-7	0-10	95-100	90-100	85-95	80-90	30-60	15-35
	34-60	Silty clay loam, clay loam.	CL	A-6, A-7	0-10	95-100	90-100	85-95	80-90	30-50	15-30
198-------------- Elburn	0-16	Silt loam--------	CL	A-6	0	100	100	95-100	90-100	25-40	10-25
	16-53	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	100	75-90	30-50	15-35
	53-60	Loam, sandy loam, clay loam.	CL, CL-ML, SC, SM-SC	A-6, A-4, A-2	0	90-100	80-100	60-90	25-80	20-40	5-20
199B------------- Plano	0-13	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	95-100	95-100	20-30	5-15
	13-52	Silty clay loam, silt loam.	CL	A-6	0	100	100	95-100	95-100	25-40	10-25
	52-64	Stratified silt loam to sandy loam.	ML, SM, CL, SC	A-4, A-2	0-5	90-100	85-95	60-90	30-70	<25	NP-10

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
221C3------------	0-6	Loam-------------	CL, CL-ML	A-4, A-6	0	95-100	95-100	80-100	50-90	15-30	4-15
Parr	6-36	Clay loam, loam, silty clay loam.	CL	A-6, A-4	0	90-100	90-100	75-100	50-95	25-35	9-15
	36-60	Loam-------------	CL, ML, CL-ML	A-4	0-3	85-95	85-95	75-85	50-65	<25	3-8
223B2, 223C2-----	0-8	Silt loam--------	CL	A-6, A-4	0-5	95-100	95-100	95-100	85-95	25-40	8-20
Varna	8-33	Silty clay, silty clay loam, clay.	CL, CH	A-7, A-6	0-10	95-100	85-100	85-100	80-100	35-56	15-29
	33-60	Silty clay loam, clay loam.	CL	A-7, A-6	0-10	95-100	85-100	85-100	80-95	30-45	13-26
224G-------------	0-7	Silt loam--------	CL, ML, CL-ML	A-4, A-6	0	95-100	95-100	90-100	90-100	20-40	3-20
Strawn	7-15	Silty clay loam, clay loam.	CL	A-6, A-7	0-5	90-100	80-100	75-95	50-95	25-45	10-23
	15-60	Loam, silt loam, clay loam.	CL, SC	A-4, A-6	0-5	75-100	70-100	60-95	40-95	20-35	7-18
230--------------	0-14	Silty clay-------	CL, CH	A-7	0	100	95-100	90-100	85-95	45-60	25-35
Rowe	14-39	Silty clay, clay	CH	A-7	0-5	95-100	95-100	90-100	75-95	50-70	30-45
	39-60	Silty clay, clay	CL, CH	A-7	0-5	95-100	90-100	90-100	75-95	45-60	20-35
232--------------	0-18	Silty clay loam	CL, CH	A-7	0	100	95-100	95-100	75-100	40-55	20-30
Ashkum	18-42	Silty clay loam, silty clay.	CL, CH	A-7	0	100	90-100	85-100	75-100	45-65	20-35
	42-60	Silty clay loam, silty clay.	CL	A-7, A-6	0-5	95-100	85-100	80-100	75-95	35-50	15-30
233B-------------	0-5	Silt loam--------	CL, ML	A-4, A-6, A-7	0	100	100	95-100	95-100	28-45	5-15
Birkbeck	5-10	Silt loam--------	CL, ML	A-4, A-6	0	100	100	100	95-100	30-40	7-15
	10-46	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	95-100	95-100	85-100	30-50	10-25
	46-55	Loam, silty clay loam, clay loam.	CL, CL-ML	A-4, A-6	0-5	95-100	85-100	70-100	55-80	25-40	5-20
	55-60	Loam, silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0-5	95-100	85-100	70-100	55-80	20-40	5-20
235--------------	0-16	Silty clay-------	CH, CL	A-7	0	100	100	95-100	85-95	45-60	20-30
Bryce	16-44	Silty clay, clay	CH	A-7	0-5	95-100	95-100	95-100	75-95	50-60	25-35
	44-60	Silty clay, silty clay loam, clay.	CH, CL	A-7	0-5	95-100	90-100	90-100	75-95	40-65	20-40
236--------------	0-13	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	95-100	90-100	25-40	5-15
Sabina	13-50	Silty clay loam, silty clay.	CL, CH	A-7	0	100	100	95-100	85-100	40-60	20-40
	50-58	Clay loam, silty clay loam, loam.	CL, CL-ML	A-4, A-6, A-7	0-5	95-100	85-100	70-100	55-75	20-50	5-30
	58-60	Loam, clay loam, silty clay loam.	CL, CL-ML	A-4, A-6, A-7	0-5	95-100	85-100	70-100	55-75	20-50	5-30
238--------------	0-16	Silty clay-------	CH, CL	A-7	0	95-100	95-100	90-100	90-100	40-60	18-30
Rantoul	16-42	Silty clay, clay	CH, CL, MH, ML	A-7	0	95-100	90-100	90-100	85-100	45-70	20-35
	42-60	Silty clay loam, silty clay, clay.	CH, CL, MH, ML	A-6, A-7	0-5	95-100	90-100	90-100	85-100	35-75	18-40

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
241C------------- Chatsworth	0-5	Silty clay-------	CH	A-7	0	100	100	95-100	90-100	50-65	25-35
	5-16	Silty clay, clay, silty clay loam.	CH, CL	A-7	0	100	95-100	95-100	90-100	45-75	20-45
	16-60	Silty clay, clay, silty clay loam.	CL, CH	A-7	0	100	95-100	90-100	85-95	45-65	20-35
242-------------- Kendall	0-15	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	20-35	5-15
	15-42	Silty clay loam	CL	A-6, A-7	0	100	100	95-100	90-100	30-45	10-20
	42-60	Stratified sandy loam to silt loam.	CL, CL-ML, SM-SC, SC	A-2, A-4	0-5	90-100	80-95	60-90	30-70	<25	4-10
291B------------- Xenia	0-16	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-90	20-35	5-15
	16-26	Silty clay loam	CL	A-6, A-7	0	100	100	95-100	85-95	35-45	15-25
	26-49	Clay loam, loam	CL	A-6, A-7	0-5	90-100	85-95	70-95	50-80	30-45	10-25
	49-60	Loam-------------	CL, CL-ML	A-4, A-6	0-5	90-95	85-95	65-95	50-75	20-30	5-15
293-------------- Andres	0-12	Loam-------------	CL	A-7, A-6	0	95-100	95-100	90-100	80-95	30-45	10-20
	12-44	Silty clay loam, clay loam, sandy clay loam.	CL	A-7, A-6	0-5	85-100	80-100	65-100	50-85	35-50	15-30
	44-60	Silty clay loam, silt loam.	CL	A-6, A-7	0-5	90-100	85-100	80-100	70-95	25-50	10-30
294B------------- Symerton	0-18	Loam-------------	CL	A-7, A-6	0	100	100	95-100	90-100	30-45	10-20
	18-34	Gravelly clay loam, gravelly loam, clay loam.	CL	A-7, A-6	0-10	95-100	75-95	75-90	60-90	35-45	15-25
	34-60	Silt loam, silty clay loam, clay loam.	CL	A-7, A-6	0-5	95-100	90-100	85-95	80-95	25-45	15-25
295-------------- Mokena	0-13	Loam-------------	CL	A-6, A-7	0	95-100	95-100	85-100	75-90	30-45	10-20
	13-43	Clay loam, silty clay loam, sandy loam.	CL, SC	A-7, A-6	0	95-100	95-100	70-90	45-85	35-50	15-25
	43-60	Silty clay, clay	CH, CL	A-7	0-5	95-100	90-100	85-100	75-95	40-55	20-31
302-------------- Ambraw	0-16	Loam-------------	CL	A-6, A-7	0	100	100	85-95	70-95	30-45	10-20
	16-33	Clay loam, sandy clay loam.	CL	A-7, A-6	0	100	90-100	85-95	50-85	30-50	10-25
	33-60	Stratified silty clay loam to sandy loam.	SC, ML, CL, SM	A-6, A-4	0	100	90-100	80-90	40-80	20-40	NP-17
330-------------- Peotone	0-15	Silty clay loam	CH, CL	A-7	0	100	95-100	95-100	80-100	40-65	15-35
	15-44	Silty clay loam, silty clay.	CH, CL	A-7	0-5	100	95-100	90-100	85-100	40-70	15-40
	44-60	Silty clay loam, silt loam, silty clay.	CL, CH, ML, MH	A-7, A-6	0-5	95-100	95-100	90-100	75-98	30-60	15-30
362-------------- Whitaker Variant	0-13	Loam-------------	CL, CL-ML, ML	A-4, A-6	0	100	95-100	80-100	60-90	15-35	2-15
	13-39	Clay loam--------	CL	A-6	0	100	95-100	90-100	70-80	30-40	10-20
	39-48	Silty clay loam	CL, CH	A-7, A-6	0-5	90-100	85-100	80-100	70-95	30-55	10-30
	48-60	Silty clay loam	CL	A-7, A-6	0-5	90-100	85-100	80-100	70-95	30-50	10-25

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag-ments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct					Pct	
387B------------- Ockley	0-15	Loam-------------	CL, ML, CL-ML	A-4	0	95-100	85-100	70-100	50-90	15-30	3-10
	15-41	Silty clay loam, clay loam, silt loam.	CL	A-6, A-4	0	90-100	80-100	70-90	55-90	25-40	8-15
	41-58	Gravelly clay loam, gravelly sandy clay loam.	CL, SC	A-6, A-4, A-2	0-2	70-85	45-85	40-70	25-55	25-40	8-15
	58-70	Stratified sand to gravelly coarse sand.	SP, SP-SM, GP, GP-GM	A-1	1-5	30-70	20-55	10-40	2-10	---	NP
398-------------- Wea	0-11	Silt loam--------	CL, CL-ML, SC, SM-SC	A-4, A-6	0	95-100	90-100	45-100	45-100	20-30	4-13
	11-54	Silty clay loam, clay loam, loam.	CL	A-6	0	90-100	85-100	75-100	50-90	30-40	11-20
	54-64	Stratified gravelly loamy sand to very gravelly coarse sand.	SP, SP-SM, GP, GP-GM	A-1	1-5	30-70	30-70	10-40	1-10	---	NP
430-------------- Raddle	0-14	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	95-100	85-100	25-40	4-15
	14-77	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	90-100	80-100	20-35	4-15
440A, 440B------- Jasper	0-19	Loam-------------	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-90	25-35	5-15
	19-49	Sandy clay loam, clay loam, silty clay loam.	SC, CL	A-6	0	100	95-100	80-95	45-85	20-35	10-20
	49-67	Stratified silt loam to sand.	SC, CL-ML, CL, SM-SC	A-4	0	100	85-100	75-90	35-85	<30	5-10
440C2------------ Jasper	0-7	Loam-------------	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-90	25-35	5-15
	7-42	Sandy clay loam, clay loam, silty clay loam.	SC, CL	A-6	0	100	95-100	80-95	45-85	20-35	10-20
	42-60	Stratified silt loam to sand.	SC, CL-ML, CL, SM-SC	A-4	0	100	85-100	75-90	35-85	<30	5-10
448B------------- Mona	0-11	Silt loam--------	CL	A-4, A-6, A-7	0	100	95-100	95-100	85-100	25-45	8-25
	11-39	Clay loam, silty clay loam, sandy clay loam.	CL	A-6, A-7	0-5	95-100	85-95	75-90	60-85	35-50	11-25
	39-60	Silty clay, clay	CH, CL	A-7	0-10	95-100	85-95	80-95	75-90	40-60	15-32
473-------------- Rossburg	0-11	Loam-------------	CL-ML, CL, ML	A-4, A-6	0	95-100	90-100	80-100	60-90	20-35	5-15
	11-55	Silt loam, loam, fine sandy loam.	CL-ML, CL, ML	A-4, A-6	0	90-100	85-100	70-95	50-80	20-35	5-15
	55-60	Stratified silt loam to gravelly sandy loam.	SM, SC, ML, CL	A-4, A-2-4	0	80-100	70-100	45-90	25-70	<25	NP-10
481-------------- Raub	0-12	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	90-100	75-95	25-35	5-15
	12-30	Silty clay loam	CL, CH	A-6, A-7	0	100	100	95-100	80-95	35-55	20-35
	30-48	Clay loam, silty clay loam.	CL	A-6, A-7	0	95-100	90-100	85-95	60-85	35-50	15-25
	48-60	Loam, clay loam	CL, ML, SC, SM	A-4, A-6	0-5	85-95	80-90	70-85	40-65	15-30	NP-15

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
490-------------- Odell	0-11	Loam-------------	CL, CL-ML	A-4, A-6	0	100	95-100	80-100	50-90	20-35	5-15
	11-30	Clay loam, loam, silty clay loam.	CL	A-4, A-6	0	95-100	90-100	75-100	50-95	25-40	7-15
	30-34	Loam-------------	CL, CL-ML	A-4	0-3	95-100	85-100	70-95	50-75	<30	4-10
	34-60	Loam-------------	ML, CL-ML, CL	A-4	0-3	95-100	85-100	70-95	50-75	<25	3-8
495B2------------ Corwin	0-8	Silt loam--------	CL, CL-ML	A-4, A-6	0	95-100	95-100	80-100	50-90	20-30	4-12
	8-34	Clay loam, loam	CL	A-6, A-4	0	90-100	90-100	75-100	50-80	30-40	9-15
	34-60	Loam, silt loam	CL, ML, CL-ML	A-4	0-3	90-95	85-95	75-85	50-75	<25	3-8
496A, 496B2------ Fincastle	0-14	Silt loam--------	CL, ML, CL-ML	A-4	0	100	95-100	90-100	75-93	<25	3-10
	14-35	Silty clay loam, silt loam.	CL	A-6	0	100	100	95-100	85-95	30-40	10-15
	35-49	Clay loam, loam, silty clay loam.	CL	A-6	0	95-100	90-98	85-95	75-85	30-40	10-15
	49-60	Loam-------------	CL	A-4, A-6	0-3	88-96	82-90	70-86	50-66	25-30	8-11
533. Urban land											
536. Dumps											
549G------------- Marseilles	0-12	Loam-------------	CL, CL-ML	A-4, A-6	0	100	100	95-100	85-100	25-40	5-15
	12-23	Silty clay loam, silty clay, clay loam.	CL, CH	A-7	0-5	95-100	90-100	85-100	80-95	40-60	15-30
	23-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
570B------------- Martinsville	0-10	Loam-------------	CL, CL-ML, ML	A-4	0	100	85-100	75-100	65-90	<25	3-8
	10-30	Clay loam, silty clay loam, sandy clay loam.	CL, SC	A-4, A-6, A-2	0	95-100	85-100	70-100	30-95	25-40	7-15
	30-58	Sandy loam, loam, sandy clay loam.	SM-SC, CL-ML, CL, SC	A-2, A-4, A-6	0	95-100	85-100	55-95	30-75	20-30	5-11
	58-65	Stratified sand to silt loam.	SM, SM-SC, CL-ML	A-4, A-2-4, A-1	0	95-100	85-100	45-95	10-75	<25	NP-8
570C2------------ Martinsville	0-10	Loam-------------	ML, CL-ML, CL	A-4	0	100	85-100	75-100	65-90	<25	3-8
	10-30	Clay loam, silty clay loam, sandy clay loam.	CL, SC	A-2-4, A-2-6, A-4, A-6	0	95-100	85-100	70-100	30-95	25-40	7-15
	30-58	Sandy loam, loam, sandy clay loam.	SM-SC, SC, CL-ML, CL	A-2-4, A-2-6, A-4, A-6	0	95-100	85-100	55-95	30-95	20-30	5-11
	58-65	Stratified sand to silt loam.	SM, SM-SC, ML, CL-ML	A-1, A-2-4, A-4	0	95-100	85-100	45-95	10-75	<25	NP-8

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
570F------------- Martinsville	0-7	Sandy loam-------	SM, SM-SC	A-4, A-2-4	0	100	85-100	55-85	30-50	<20	NP-6
	7-27	Clay loam, silty clay loam, sandy clay loam.	CL, SC	A-4, A-6, A-2	0	95-100	85-100	70-100	30-95	25-40	7-15
	27-49	Sandy loam, loam, sandy clay loam.	SM-SC, CL-ML, CL, SC	A-2, A-4, A-6	0	95-100	85-100	55-95	30-75	20-30	5-11
	49-71	Stratified sand to silt loam.	SM, SM-SC, CL-ML	A-4, A-2-4, A-1	0	95-100	85-100	45-95	10-75	<25	NP-8
571-------------- Whitaker	0-14	Loam-------------	CL, CL-ML, ML	A-4, A-6	0	100	95-100	80-100	60-90	15-35	2-15
	14-47	Clay loam, silty clay loam, sandy clay loam.	CL, CL-ML	A-6, A-4	0	100	95-100	90-100	70-80	20-35	5-15
	47-60	Stratified coarse sand to silt loam.	ML, SM, CL-ML, SM-SC	A-4	0	98-100	98-100	60-85	40-60	<25	NP-7
802B, 802F. Orthents											
864, 865. Pits											
871B------------- Lenzburg	0-2	Loam-------------	CL, ML	A-6, A-4	2-10	80-100	75-100	65-95	55-85	25-40	8-20
	2-60	Silty clay loam, silt loam, gravelly loam.	CL	A-6, A-7	5-15	75-95	70-90	65-85	60-85	25-45	10-25
871G3------------ Lenzburg	0-2	Gravelly loam----	CL, ML	A-4, A-6, A-7	3-15	80-95	75-90	65-90	55-85	25-45	8-25
	2-60	Silty clay loam, silt loam, gravelly loam.	CL	A-6, A-7	5-15	75-95	70-90	65-85	60-85	25-45	10-25
2023B:											
Blount----------	0-14	Silt loam--------	CL	A-6, A-4	0-5	95-100	95-100	90-100	80-95	25-40	8-20
	14-46	Silty clay loam, silty clay, clay loam.	CH, CL	A-7, A-6	0-5	95-100	90-100	80-90	75-85	35-60	15-35
	46-50	Silty clay loam, clay loam.	CL, CH, ML, MH	A-6, A-7	0-5	95-100	90-100	80-90	70-90	35-55	10-30
	50-60	Silty clay loam, clay loam.	CL	A-6, A-7	0-10	90-100	90-100	80-100	70-90	30-45	10-25
Urban land.											
2146A:											
Elliott---------	0-18	Silt loam--------	CL	A-6, A-4	0	95-100	95-100	95-100	75-100	30-40	8-18
	18-39	Silty clay, silty clay loam, clay.	CH, CL	A-6, A-7	0-5	95-100	90-100	90-100	70-100	30-52	11-26
	39-60	Silty clay loam, clay loam, silt loam.	CL	A-6, A-7	0-5	90-100	85-100	80-100	70-95	28-45	11-24
Urban land.											

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 3 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
2152: Drummer	0-16	Silty clay loam	CL	A-6, A-7	0	100	95-100	95-100	85-95	30-50	15-30
	16-57	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	95-100	95-100	85-95	30-50	15-30
	57-60	Stratified loamy sand to silty clay loam.	SC, CL	A-4, A-6	0-5	95-100	85-95	75-95	45-80	20-35	7-20
Urban land.											
2232: Ashkum	0-17	Silty clay loam	CL, CH	A-7	0	100	95-100	95-100	75-100	40-55	20-30
	17-39	Silty clay loam, silty clay.	CL, CH	A-7	0	100	90-100	85-100	75-100	45-65	20-35
	39-60	Silty clay loam, silty clay.	CL	A-7, A-6	0-5	95-100	85-100	80-100	75-95	35-50	15-30
Urban land.											
2242A: Kendall	0-11	Silt loam	CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	20-35	5-15
	11-44	Silty clay loam	CL	A-6, A-7	0	100	100	95-100	90-100	30-45	10-20
	44-60	Stratified sandy loam to silt loam.	CL, CL-ML, SM-SC, SC	A-2, A-4	0-5	90-100	80-95	60-90	30-70	<25	4-10
Urban land.											
2291B: Xenia	0-10	Silt loam	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-90	20-35	5-15
	10-32	Silty clay loam	CL	A-6, A-7	0	100	100	95-100	85-95	35-45	15-25
	32-49	Clay loam, loam	CL	A-6, A-7	0-5	90-100	85-95	70-95	50-80	30-45	10-25
	49-60	Loam	CL, CL-ML	A-4, A-6	0-5	90-95	85-95	65-95	50-75	20-30	5-15
Urban land.											
2570B: Martinsville	0-11	Loam	CL, CL-ML, ML	A-4	0	100	85-100	75-100	65-90	<25	3-8
	11-43	Clay loam, silty clay loam, sandy clay loam.	CL, SC	A-4, A-6, A-2	0	95-100	85-100	70-100	30-95	25-40	7-15
	43-47	Sandy loam, loam, sandy clay loam.	SM-SC, CL-ML, CL, SC	A-2, A-4, A-6	0	95-100	85-100	55-95	30-75	20-30	5-11
	47-60	Stratified sand to silt loam.	SM, SM-SC, CL-ML	A-4, A-2-4, A-1	0	95-100	85-100	45-95	10-75	<25	NP-8
Urban land.											
7304A, 8304 Landes	0-16	Fine sandy loam	SM, SC, SM-SC	A-4, A-2-4	0	100	70-100	70-95	20-50	<25	NP-10
	16-24	Loam, very fine sandy loam, loamy fine sand.	SM, CL-ML, SC, SM-SC	A-4, A-2-4	0	100	85-100	70-100	15-60	<25	NP-10
	24-60	Stratified sand to silt loam.	SM, SP-SM, SC, SM-SC	A-4, A-2-4	0	100	85-100	70-85	10-50	<30	NP-10

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

(The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated)

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
17--------------- Keomah	0-14	16-26	1.30-1.40	0.6-2.0	0.22-0.24	4.5-7.3	Low----------	0.37	3	6	1-2
	14-32	35-42	1.30-1.45	0.06-0.6	0.18-0.20	4.5-6.0	High---------	0.37			
	32-62	24-38	1.40-1.55	0.2-0.6	0.18-0.20	5.1-7.3	Moderate-----	0.37			
23A, 23B2-------- Blount	0-11	22-27	1.35-1.55	0.6-2.0	0.20-0.24	5.1-7.3	Low----------	0.43	3	6	2-3
	11-34	35-50	1.40-1.70	0.06-0.6	0.12-0.19	4.5-6.5	Moderate-----	0.43			
	34-40	27-38	1.50-1.70	0.06-0.6	0.12-0.19	6.1-7.8	Moderate-----	0.43			
	40-60	27-38	1.60-1.85	0.06-0.6	0.07-0.10	7.4-8.4	Moderate-----	0.43			
27C3, 27F-------- Miami	0-11	11-22	1.30-1.45	0.6-2.0	0.20-0.24	5.6-7.3	Low----------	0.37	4	5	.5-3
	11-33	27-35	1.45-1.65	0.6-2.0	0.15-0.20	5.1-6.0	Moderate-----	0.37			
	33-38	20-27	1.45-1.65	0.6-2.0	0.14-0.19	6.6-7.8	Low----------	0.37			
	38-60	15-25	1.70-1.90	0.06-0.6	0.05-0.10	7.4-8.4	Moderate-----	0.37			
43--------------- Ipava	0-14	20-27	1.15-1.35	0.6-2.0	0.22-0.24	5.6-7.3	Moderate-----	0.28	5	6	4-5
	14-46	35-43	1.25-1.50	0.2-0.6	0.11-0.20	5.6-7.8	High---------	0.43			
	46-60	20-27	1.30-1.55	0.2-0.6	0.20-0.22	6.1-8.4	Moderate-----	0.43			
56B2------------- Dana	0-7	11-22	1.40-1.55	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.32	5	5	3-5
	7-29	27-35	1.45-1.65	0.6-2.0	0.18-0.20	5.1-6.0	Moderate-----	0.43			
	29-39	27-35	1.45-1.65	0.6-2.0	0.15-0.19	6.1-7.3	Moderate-----	0.43			
	39-60	15-22	1.70-1.90	0.2-0.6	0.05-0.10	6.6-8.4	Low----------	0.43			
59--------------- Lisbon	0-11	20-25	1.10-1.30	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.28	5	6	3-5
	11-25	25-35	1.15-1.35	0.6-2.0	0.18-0.22	6.1-7.8	Moderate-----	0.43			
	25-39	20-30	1.45-1.55	0.6-2.0	0.15-0.20	6.1-8.4	Low----------	0.43			
	39-60	18-27	1.50-1.60	0.2-0.6	0.07-0.11	7.4-8.4	Low----------	0.43			
67--------------- Harpster	0-12	27-35	1.05-1.25	0.6-2.0	0.21-0.24	7.4-8.4	Moderate-----	0.28	5	4L	5-6
	12-35	27-35	1.20-1.50	0.6-2.0	0.18-0.22	7.4-8.4	Moderate-----	0.28			
	35-41	22-35	1.25-1.55	0.6-2.0	0.17-0.22	7.4-8.4	Moderate-----	0.28			
	41-60	15-30	1.40-1.60	0.6-2.0	0.11-0.22	7.4-8.4	Low----------	0.28			
68--------------- Sable	0-14	27-35	1.15-1.35	0.6-2.0	0.21-0.23	5.6-7.3	Moderate-----	0.28	5	7	5-6
	14-48	24-35	1.30-1.50	0.6-2.0	0.18-0.20	5.6-7.8	Moderate-----	0.28			
	48-70	20-28	1.30-1.50	0.6-2.0	0.20-0.22	6.6-8.4	Low----------	0.28			
69--------------- Milford	0-18	35-40	1.30-1.50	0.6-2.0	0.20-0.23	5.6-7.3	High---------	0.28	5	4	5-6
	18-52	35-42	1.40-1.60	0.2-0.6	0.18-0.20	5.6-7.8	Moderate-----	0.43			
	52-60	20-30	1.50-1.70	0.2-0.6	0.20-0.22	6.6-8.4	Moderate-----	0.43			
88B-------------- Sparta	0-11	3-10	1.20-1.40	2.0-6.0	0.09-0.12	5.1-7.3	Low----------	0.17	5	2	1-2
	11-37	1-8	1.40-1.60	6.0-20	0.05-0.11	5.1-6.5	Low----------	0.17			
	37-60	0-5	1.50-1.70	6.0-20	0.04-0.07	5.1-6.0	Low----------	0.17			
91A-------------- Swygert	0-14	27-40	1.25-1.50	0.2-0.6	0.18-0.22	5.6-7.3	Moderate-----	0.37	3	7	3-5
	14-38	45-50	1.40-1.70	0.06-0.2	0.05-0.12	5.6-8.4	High---------	0.28			
	38-60	38-60	1.40-1.75	<0.06	0.03-0.05	7.4-8.4	High---------	0.28			
91B2, 91C2------- Swygert	0-8	27-40	1.25-1.50	0.2-0.6	0.18-0.22	5.6-7.3	Moderate-----	0.37	3	7	3-5
	8-37	45-50	1.40-1.70	0.06-0.2	0.05-0.12	5.6-8.4	High---------	0.28			
	37-60	38-60	1.40-1.75	<0.06	0.03-0.05	7.4-8.4	High---------	0.28			
102-------------- La Hogue	0-12	10-27	1.40-1.60	0.6-2.0	0.20-0.24	6.1-7.3	Low----------	0.28	5	5	3-4
	12-39	18-35	1.50-1.70	0.6-2.0	0.12-0.20	5.1-7.3	Moderate-----	0.28			
	39-60	5-20	1.60-1.80	0.6-6.0	0.05-0.22	5.6-7.8	Low----------	0.20			

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
107-------------- Sawmill	0-26	27-35	1.20-1.40	0.6-2.0	0.21-0.23	6.1-7.8	Moderate-----	0.28	5	7	4-5
	26-45	25-35	1.30-1.45	0.6-2.0	0.17-0.20	6.1-7.8	Moderate-----	0.28			
	45-60	18-35	1.35-1.50	0.6-2.0	0.15-0.19	6.1-8.4	Moderate-----	0.28			
125-------------- Selma	0-22	20-27	1.40-1.60	0.6-2.0	0.20-0.24	6.1-7.8	Low----------	0.28	5	6	4-6
	22-43	18-30	1.40-1.60	0.6-2.0	0.15-0.19	6.1-8.4	Moderate-----	0.28			
	43-60	7-18	1.60-1.90	2.0-6.0	0.07-0.19	6.6-8.4	Low----------	0.28			
131B------------- Alvin	0-8	10-15	1.45-1.65	2.0-6.0	0.14-0.20	4.5-7.3	Low----------	0.24	5	3	.5-1
	8-11	10-15	1.45-1.65	0.6-6.0	0.14-0.20	4.5-6.0	Low----------	0.24			
	11-25	15-18	1.45-1.65	0.6-6.0	0.12-0.20	4.5-6.0	Low----------	0.24			
	25-60	3-10	1.55-1.75	2.0-6.0	0.05-0.13	5.1-8.4	Low----------	0.24			
132-------------- Starks	0-12	18-27	1.15-1.35	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.37	5	6	1-3
	12-26	27-35	1.35-1.55	0.6-2.0	0.18-0.20	5.1-6.5	Moderate-----	0.37			
	26-47	18-30	1.45-1.65	0.6-2.0	0.16-0.19	5.1-7.8	Moderate-----	0.37			
	47-60	5-20	1.55-1.75	0.6-2.0	0.08-0.18	5.1-7.8	Low----------	0.37			
134B------------- Camden	0-10	14-27	1.15-1.35	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.37	5	6	1-2
	10-28	22-35	1.35-1.55	0.6-2.0	0.16-0.20	5.1-7.3	Moderate-----	0.37			
	28-50	18-30	1.45-1.65	0.6-2.0	0.11-0.22	5.1-7.3	Low----------	0.37			
	50-60	5-20	1.55-1.75	0.6-6.0	0.11-0.22	5.6-8.4	Low----------	0.37			
145B2------------ Saybrook	0-9	20-26	1.10-1.30	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.32	5	6	3-4
	9-22	27-35	1.20-1.40	0.6-2.0	0.18-0.20	5.6-7.3	Moderate-----	0.43			
	22-60	24-35	1.50-1.70	0.6-2.0	0.15-0.21	5.6-8.4	Low----------	0.43			
146A------------- Elliott	0-12	24-27	1.10-1.30	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.28	4	6	4-5
	12-40	35-50	1.30-1.60	0.2-0.6	0.11-0.20	5.6-7.8	Moderate-----	0.28			
	40-60	27-40	1.60-1.75	0.06-0.6	0.07-0.10	7.4-8.4	Moderate-----	0.43			
146B2------------ Elliott	0-8	27-35	1.15-1.35	0.6-2.0	0.21-0.23	5.6-7.3	Moderate-----	0.28	4	7	4-5
	8-27	35-50	1.30-1.60	0.2-0.6	0.11-0.20	5.6-7.8	Moderate-----	0.28			
	27-60	27-40	1.60-1.75	0.06-0.6	0.07-0.10	7.4-8.4	Moderate-----	0.43			
147A------------- Clarence	0-12	27-40	1.45-1.65	0.2-0.6	0.21-0.23	5.6-7.3	Moderate-----	0.37	3	7	3-5
	12-38	50-60	1.40-1.60	<0.06	0.07-0.09	5.6-8.4	Moderate-----	0.28			
	38-60	40-60	1.65-1.75	<0.06	0.05-0.07	7.4-8.4	Moderate-----	0.28			
147B2------------ Clarence	0-7	40-55	1.40-1.60	0.06-0.2	0.12-0.14	5.6-7.3	Moderate-----	0.28	3	4	3-5
	7-32	50-60	1.40-1.60	<0.06	0.07-0.09	5.6-8.4	Moderate-----	0.28			
	32-60	40-60	1.65-1.75	<0.06	0.05-0.07	7.4-8.4	Moderate-----	0.28			
148A, 148B------- Proctor	0-12	18-27	1.10-1.30	0.6-2.0	0.22-0.24	5.1-7.8	Low----------	0.32	5	6	3-4
	12-25	25-35	1.20-1.45	0.6-2.0	0.18-0.20	5.6-7.3	Moderate-----	0.43			
	25-38	15-32	1.30-1.55	0.6-6.0	0.13-0.19	5.6-7.3	Moderate-----	0.43			
	38-60	15-32	1.40-1.70	0.6-6.0	0.07-0.19	5.6-7.8	Low----------	0.43			
148C2------------ Proctor	0-8	18-27	1.10-1.30	0.6-2.0	0.22-0.24	5.1-7.8	Low----------	0.32	5	6	3-4
	8-27	25-35	1.20-1.45	0.6-2.0	0.18-0.20	5.6-7.3	Moderate-----	0.43			
	27-48	22-35	1.30-1.55	0.6-6.0	0.13-0.16	5.6-7.3	Moderate-----	0.43			
	48-60	15-32	1.40-1.70	0.6-6.0	0.07-0.19	6.1-7.8	Low----------	0.43			
149-------------- Brenton	0-12	20-27	1.25-1.50	0.6-2.0	0.22-0.24	5.6-7.8	Low----------	0.28	5	6	4-5
	12-27	25-35	1.30-1.55	0.6-2.0	0.18-0.20	5.6-7.3	Moderate-----	0.28			
	27-35	20-30	1.40-1.60	0.6-2.0	0.15-0.19	5.6-7.8	Moderate-----	0.28			
	35-60	15-30	1.50-1.70	0.6-2.0	0.11-0.20	5.6-8.4	Low----------	0.28			
150B, 150C2------ Onarga	0-13	8-15	1.15-1.45	0.6-6.0	0.13-0.22	5.6-7.8	Low----------	0.20	4	3	2-4
	13-32	15-18	1.45-1.70	0.6-6.0	0.15-0.19	4.5-7.3	Low----------	0.20			
	32-60	2-10	1.65-1.90	6.0-20	0.05-0.13	5.1-7.3	Low----------	0.15			

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
152-------------- Drummer	0-13	27-35	1.10-1.30	0.6-2.0	0.21-0.23	5.6-7.8	Moderate-----	0.28	5	7	5-7
	13-47	20-35	1.20-1.45	0.6-2.0	0.21-0.24	5.6-7.8	Moderate-----	0.28			
	47-54	22-33	1.30-1.55	0.6-2.0	0.17-0.20	6.1-8.4	Moderate-----	0.28			
	54-60	15-32	1.40-1.70	0.6-2.0	0.11-0.19	6.6-8.4	Low----------	0.28			
153-------------- Pella	0-12	27-35	1.10-1.30	0.6-2.0	0.21-0.23	6.1-7.8	Moderate-----	0.28	5	7	5-6
	12-28	27-35	1.20-1.45	0.6-2.0	0.21-0.24	6.6-7.8	Moderate-----	0.28			
	28-46	15-30	1.35-1.60	0.6-2.0	0.15-0.20	7.4-8.4	Moderate-----	0.28			
	46-60	15-30	1.40-1.70	0.6-2.0	0.10-0.22	7.4-8.4	Low----------	0.28			
154-------------- Flanagan	0-16	20-27	1.20-1.40	0.6-2.0	0.22-0.24	5.1-7.3	Moderate-----	0.28	5	6	4-5
	16-45	35-42	1.25-1.45	0.6-2.0	0.15-0.22	5.6-7.3	High---------	0.43			
	45-60	20-30	1.45-1.70	0.2-0.6	0.15-0.22	6.1-8.4	Low----------	0.43			
171B------------- Catlin	0-15	18-27	1.15-1.40	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.32	5	6	3-4
	15-53	27-35	1.25-1.55	0.6-2.0	0.18-0.20	5.1-7.3	Moderate-----	0.43			
	53-74	20-30	1.40-1.70	0.6-2.0	0.07-0.11	6.1-8.4	Low----------	0.43			
182-------------- Peotone	0-21	30-40	1.20-1.40	0.2-0.6	0.18-0.30	5.6-7.3	High---------	0.28	5	4	7-15
	21-56	30-55	0.80-1.50	0.06-0.6	0.25-0.35	5.6-7.3	High---------	0.28			
	56-64	---	---	---	---	---	-------------	----			
183-------------- Shaffton	0-13	20-27	1.45-1.55	0.6-2.0	0.20-0.22	5.1-7.3	Moderate-----	0.24	5	6	3-5
	13-44	18-26	1.55-1.65	0.6-2.0	0.17-0.19	4.5-6.0	Moderate-----	0.32			
	44-60	8-16	1.65-1.70	6.0-20	0.05-0.08	4.5-6.0	Low----------	0.17			
194C2------------ Morley	0-6	22-27	1.35-1.55	0.6-2.0	0.18-0.22	5.1-7.3	Low----------	0.37	4	6	1-3
	6-20	30-50	1.55-1.70	0.2-0.6	0.11-0.15	5.6-7.8	Moderate-----	0.32			
	20-28	27-50	1.60-1.80	0.06-0.6	0.07-0.12	6.1-8.4	Moderate-----	0.43			
	28-60	27-40	1.60-1.80	0.06-0.6	0.07-0.12	6.1-8.4	Moderate-----	0.43			
194D3------------ Morley	0-3	22-27	1.35-1.55	0.6-2.0	0.20-0.24	5.1-7.3	Low----------	0.37	4	6	2-3
	3-20	30-50	1.55-1.70	0.2-0.6	0.11-0.15	5.6-7.8	Moderate-----	0.32			
	20-25	27-50	1.60-1.80	0.06-0.6	0.07-0.12	6.1-8.4	Moderate-----	0.43			
	25-60	27-40	1.60-1.80	0.06-0.6	0.07-0.12	6.1-8.4	Moderate-----	0.43			
194F, 194G------- Morley	0-9	22-27	1.35-1.55	0.6-2.0	0.20-0.24	5.1-6.5	Low----------	0.43	4	6	1-3
	9-34	35-50	1.55-1.70	0.06-0.6	0.11-0.15	6.1-8.4	Moderate-----	0.43			
	34-60	27-40	1.60-1.80	0.06-0.6	0.07-0.12	6.1-8.4	Moderate-----	0.43			
198-------------- Elburn	0-16	22-27	1.10-1.30	0.6-2.0	0.22-0.24	5.6-7.8	Low----------	0.28	5	6	4-5
	16-53	25-35	1.20-1.40	0.6-2.0	0.18-0.20	5.6-7.8	Moderate-----	0.43			
	53-60	15-25	1.50-1.70	0.6-6.0	0.12-0.18	6.1-8.4	Low----------	0.43			
199B------------- Plano	0-13	18-27	1.10-1.30	0.6-2.0	0.22-0.24	6.1-7.3	Low----------	0.32	4	6	3-5
	13-52	25-35	1.20-1.40	0.6-2.0	0.18-0.20	5.1-7.3	Moderate-----	0.43			
	52-64	10-20	1.50-1.70	0.6-2.0	0.11-0.22	5.6-8.4	Low----------	0.43			
221C3------------ Parr	0-6	12-22	1.30-1.45	0.6-2.0	0.20-0.24	5.6-7.3	Low----------	0.32	4	5	2-4
	6-36	22-32	1.40-1.55	0.6-2.0	0.15-0.19	5.6-7.3	Moderate-----	0.32			
	36-60	10-20	1.70-1.90	0.06-0.2	0.05-0.10	7.4-8.4	Low----------	0.32			
223B2, 223C2----- Varna	0-8	20-27	1.10-1.30	0.6-2.0	0.22-0.24	5.6-7.8	Low----------	0.28	5	6	3-4
	8-33	35-48	1.30-1.60	0.2-0.6	0.09-0.19	5.6-7.3	Moderate-----	0.37			
	33-60	27-40	1.50-1.70	0.06-0.6	0.12-0.18	6.6-8.4	Low----------	0.37			
224G------------- Strawn	0-7	18-27	1.15-1.45	0.6-2.0	0.20-0.24	6.1-7.3	Low----------	0.37	5	6	1-3
	7-15	27-35	1.35-1.55	0.6-2.0	0.15-0.20	5.6-7.8	Moderate-----	0.37			
	15-60	22-30	1.50-1.70	0.2-0.6	0.08-0.12	7.4-8.4	Low----------	0.37			
230-------------- Rowe	0-14	40-50	1.25-1.45	0.06-0.2	0.14-0.18	5.1-7.8	Moderate-----	0.28	5	4	3-5
	14-39	48-60	1.40-1.60	<0.06	0.09-0.13	6.1-8.4	High---------	0.28			
	39-60	40-50	1.40-1.70	<0.06	0.08-0.12	7.4-8.4	Moderate-----	0.20			

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodi-bility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
232-------------- Ashkum	0-18	35-40	1.20-1.40	0.2-0.6	0.20-0.23	5.6-7.8	High---------	0.28	5	4	5-7
	18-42	35-45	1.30-1.60	0.2-0.6	0.11-0.20	6.1-7.8	High---------	0.28			
	42-60	30-40	1.30-1.60	0.2-0.6	0.18-0.20	6.1-8.4	Moderate-----	0.28			
233B------------- Birkbeck	0-5	15-27	1.20-1.40	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.37	5	6	1-3
	5-10	15-27	1.25-1.50	0.6-2.0	0.20-0.24	4.5-7.3	Low----------	0.37			
	10-46	25-35	1.30-1.50	0.6-2.0	0.18-0.22	4.5-7.3	Moderate-----	0.37			
	46-55	20-30	1.40-1.60	0.2-0.6	0.14-0.20	5.6-7.8	Low----------	0.37			
	55-60	17-30	1.55-1.90	0.2-0.6	0.05-0.19	6.6-8.4	Low----------	0.37			
235-------------- Bryce	0-16	40-48	1.30-1.50	0.2-0.6	0.12-0.16	5.6-7.8	High---------	0.28	5	4	5-7
	16-44	42-52	1.35-1.60	0.06-0.2	0.09-0.13	6.6-8.4	High---------	0.28			
	44-60	38-60	1.60-1.75	<0.2	0.03-0.05	7.4-8.4	High---------	0.28			
236-------------- Sabina	0-13	20-27	1.25-1.45	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.37	5	6	1-3
	13-50	35-42	1.35-1.55	0.2-0.6	0.11-0.20	5.6-7.3	High---------	0.37			
	50-58	20-35	1.50-1.75	0.2-0.6	0.11-0.18	6.6-7.8	Low----------	0.37			
	58-60	15-32	1.50-1.80	0.2-0.6	0.11-0.18	7.4-8.4	Low----------	0.37			
238-------------- Rantoul	0-16	40-45	1.35-1.55	0.2-0.6	0.12-0.23	6.1-7.3	High---------	0.28	3	4	5-7
	16-42	42-60	1.45-1.65	<0.06	0.09-0.13	6.1-8.4	High---------	0.28			
	42-60	35-45	1.50-1.70	<0.06	0.08-0.20	7.4-8.4	High---------	0.28			
241C------------- Chatsworth	0-5	40-60	1.30-1.50	<0.06	0.06-0.07	5.6-8.4	Moderate-----	0.32	3	4	.5-1
	5-16	35-60	1.50-1.70	<0.06	0.05-0.07	6.1-8.4	Moderate-----	0.32			
	16-60	35-50	1.60-1.85	<0.06	0.04-0.06	7.4-8.4	Moderate-----	0.32			
242-------------- Kendall	0-15	20-27	1.15-1.30	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.37	5	6	1-3
	15-42	27-35	1.30-1.50	0.6-2.0	0.18-0.20	4.5-7.3	Moderate-----	0.37			
	42-60	10-25	1.55-1.70	0.6-2.0	0.11-0.22	5.6-8.4	Low----------	0.37			
291B------------- Xenia	0-16	11-22	1.30-1.50	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.37	5	5	1-3
	16-26	27-35	1.45-1.65	0.6-2.0	0.18-0.20	5.1-7.3	Moderate-----	0.37			
	26-49	24-35	1.45-1.65	0.2-0.6	0.15-0.19	5.6-7.3	Moderate-----	0.37			
	49-60	12-20	1.70-1.90	0.2-0.6	0.05-0.10	7.4-8.4	Low----------	0.37			
293-------------- Andres	0-12	21-27	1.20-1.40	0.6-2.0	0.21-0.24	5.6-7.3	Low----------	0.28	5	6	4-5
	12-44	27-35	1.35-1.60	0.6-2.0	0.16-0.20	5.6-7.8	Moderate-----	0.28			
	44-60	24-35	1.45-1.70	0.2-0.6	0.18-0.20	7.4-8.4	Moderate-----	0.37			
294B------------- Symerton	0-18	20-27	1.15-1.30	0.6-2.0	0.21-0.24	5.6-7.3	Low----------	0.32	5	6	3-4
	18-34	27-35	1.35-1.60	0.6-2.0	0.12-0.18	5.6-7.8	Moderate-----	0.32			
	34-60	20-35	1.45-1.70	0.2-0.6	0.09-0.10	6.6-8.4	Moderate-----	0.43			
295-------------- Mokena	0-13	20-27	1.15-1.35	0.6-2.0	0.20-0.24	6.1-8.4	Low----------	0.28	4	6	4-5
	13-43	23-35	1.35-1.55	0.2-0.6	0.15-0.20	6.1-8.4	Moderate-----	0.28			
	43-60	40-45	1.40-1.70	0.06-0.2	0.08-0.12	6.6-8.4	Moderate-----	0.28			
302-------------- Ambraw	0-16	18-27	1.40-1.60	0.6-2.0	0.17-0.22	5.6-7.3	Moderate-----	0.28	5	6	2-3
	16-33	24-35	1.45-1.65	0.2-2.0	0.15-0.19	5.1-7.3	Moderate-----	0.32			
	33-60	18-30	1.50-1.70	0.2-2.0	0.11-0.22	6.1-8.4	Low----------	0.43			
330-------------- Peotone	0-15	33-40	1.20-1.40	0.2-0.6	0.21-0.23	5.6-7.8	High---------	0.28	5	4	5-7
	15-44	35-45	1.30-1.60	0.2-0.6	0.11-0.20	6.1-7.8	High---------	0.28			
	44-60	25-42	1.40-1.65	0.2-0.6	0.18-0.20	6.6-8.4	High---------	0.28			
362-------------- Whitaker Variant	0-13	8-19	1.30-1.45	0.6-2.0	0.20-0.24	5.6-7.3	Low----------	0.37	5	5	1-3
	13-39	27-35	1.40-1.60	0.6-2.0	0.15-0.19	5.6-7.3	Moderate-----	0.37			
	39-48	30-35	1.45-1.65	0.2-0.6	0.14-0.20	6.1-7.3	Moderate-----	0.37			
	48-60	27-35	1.45-1.70	0.2-0.6	0.14-0.20	7.4-8.4	Moderate-----	0.37			

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodi-bility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
387B-------------Ockley	0-15	11-22	1.30-1.40	0.6-2.0	0.20-0.24	5.6-6.5	Low----------	0.37	5	5	.5-3
	15-41	20-35	1.45-1.60	0.6-2.0	0.15-0.22	4.5-6.0	Moderate-----	0.37			
	41-58	20-35	1.40-1.55	0.6-2.0	0.06-0.11	5.6-6.5	Moderate-----	0.24			
	58-70	2-5	1.60-1.80	>20	0.02-0.04	7.4-8.4	Low----------	0.10			
398--------------Wea	0-11	12-22	1.30-1.45	0.6-2.0	0.20-0.24	5.6-7.3	Low----------	0.32	5	5	2-5
	11-54	20-32	1.40-1.60	0.6-2.0	0.15-0.20	5.1-6.5	Moderate-----	0.32			
	54-64	1-5	1.60-1.80	>20	0.02-0.04	7.4-8.4	Low----------	0.10			
430--------------Raddle	0-14	18-24	1.20-1.40	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.32	5	6	2-4
	14-77	18-24	1.20-1.40	0.6-2.0	0.20-0.22	5.6-7.3	Low----------	0.43			
440A, 440B-------Jasper	0-19	10-22	1.30-1.45	0.6-2.0	0.20-0.24	5.1-7.3	Low----------	0.28	5	5	3-5
	19-49	20-32	1.40-1.60	0.6-2.0	0.16-0.18	5.1-7.3	Low----------	0.28			
	49-67	5-20	1.50-1.70	0.6-2.0	0.19-0.21	7.4-8.4	Low----------	0.28			
440C2------------Jasper	0-7	10-22	1.30-1.45	0.6-2.0	0.20-0.24	5.1-7.3	Low----------	0.28	5	5	3-5
	7-42	20-32	1.40-1.60	0.6-2.0	0.16-0.18	5.1-7.3	Low----------	0.28			
	42-60	5-20	1.50-1.70	0.6-2.0	0.19-0.21	7.4-8.4	Low----------	0.28			
448B-------------Mona	0-11	20-33	1.10-1.30	0.6-2.0	0.17-0.24	6.1-7.8	Low----------	0.28	3	6	2-5
	11-39	25-35	1.35-1.55	0.2-0.6	0.15-0.20	5.6-7.8	Moderate-----	0.28			
	39-60	40-50	1.40-1.65	0.06-0.2	0.05-0.08	7.4-8.4	Moderate-----	0.28			
473--------------Rossburg	0-11	13-27	1.20-1.50	0.6-2.0	0.19-0.24	6.1-7.8	Low----------	0.37	5	6	4-8
	11-55	18-27	1.25-1.60	0.6-2.0	0.15-0.22	6.1-7.8	Low----------	0.37			
	55-60	5-15	1.30-1.60	2.0-20	0.05-0.15	6.6-8.4	Low----------	0.24			
481--------------Raub	0-12	20-27	1.30-1.50	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.28	5	6	2-4
	12-30	27-35	1.50-1.70	0.2-0.6	0.18-0.20	5.1-6.5	Moderate-----	0.37			
	30-48	27-35	1.50-1.70	0.2-0.6	0.15-0.19	6.1-7.3	Moderate-----	0.37			
	48-60	20-32	1.50-1.70	0.2-0.6	0.05-0.19	7.4-8.4	Low----------	0.37			
490--------------Odell	0-11	18-27	1.30-1.50	0.6-2.0	0.20-0.24	5.6-7.3	Low----------	0.28	4	6	2-4
	11-30	25-35	1.50-1.70	0.6-2.0	0.15-0.19	5.6-7.3	Moderate-----	0.28			
	30-34	12-25	1.55-1.70	0.2-0.6	0.08-0.15	6.6-8.4	Low----------	0.37			
	34-60	10-20	1.70-1.90	0.06-0.2	0.05-0.10	7.4-8.4	Low----------	0.37			
495B2------------Corwin	0-8	12-22	1.30-1.45	0.6-2.0	0.20-0.24	5.1-7.3	Low----------	0.28	5	5	2-4
	8-34	25-35	1.40-1.60	0.6-2.0	0.15-0.19	5.1-6.5	Moderate-----	0.28			
	34-60	10-20	1.70-1.90	0.2-0.6	0.05-0.10	7.9-8.4	Low----------	0.37			
496A, 496B2------Fincastle	0-14	11-22	1.40-1.55	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.37	5	5	1-3
	14-35	23-35	1.45-1.65	0.6-2.0	0.18-0.20	4.5-6.5	Moderate-----	0.37			
	35-49	24-32	1.45-1.65	0.6-2.0	0.15-0.19	5.1-7.8	Moderate-----	0.37			
	49-60	20-26	1.55-1.90	0.2-0.6	0.05-0.19	7.4-8.4	Low----------	0.37			
533. Urban land											
536. Dumps											
549G-------------Marseilles	0-12	20-27	1.20-1.40	0.6-2.0	0.20-0.24	5.1-6.5	Low----------	0.37	4	6	1-3
	12-23	22-32	1.35-1.60	0.06-0.2	0.09-0.20	4.5-6.5	Moderate-----	0.37			
	23-60	---	---	---	---	---	-------------	----			
570B-------------Martinsville	0-10	8-20	1.30-1.45	0.6-2.0	0.20-0.24	5.1-7.3	Low----------	0.37	5	5	1-2
	10-30	20-33	1.40-1.60	0.6-2.0	0.16-0.20	5.1-6.5	Moderate-----	0.37			
	30-58	15-25	1.40-1.60	0.6-2.0	0.12-0.17	5.1-6.5	Low----------	0.24			
	58-65	2-20	1.50-1.70	0.6-6.0	0.08-0.17	5.6-8.4	Low----------	0.24			

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodi-bility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
570C2------------	0-10	12-20	1.35-1.45	0.6-2.0	0.20-0.22	5.1-7.3	Low----------	0.37	5	5	.5-2
Martinsville	10-30	20-33	1.40-1.60	0.6-2.0	0.16-0.20	5.1-6.5	Moderate-----	0.37			
	30-58	15-25	1.40-1.60	0.6-2.0	0.12-0.17	5.1-6.5	Low----------	0.24			
	58-65	2-20	1.50-1.70	0.6-6.0	0.08-0.17	5.6-8.4	Low----------	0.24			
570F-------------	0-7	5-15	1.35-1.50	2.0-6.0	0.13-0.18	5.1-7.3	Low----------	0.24	5	3	1-2
Martinsville	7-27	20-33	1.40-1.60	0.6-2.0	0.16-0.20	5.1-6.5	Moderate-----	0.37			
	27-49	15-25	1.40-1.60	0.6-2.0	0.12-0.17	5.1-6.5	Low----------	0.24			
	49-71	2-20	1.50-1.70	0.6-6.0	0.08-0.17	5.6-8.4	Low----------	0.24			
571--------------	0-14	8-19	1.30-1.45	0.6-2.0	0.20-0.24	5.6-7.3	Low----------	0.37	5	5	1-3
Whitaker	14-47	18-33	1.40-1.60	0.6-2.0	0.15-0.19	5.1-7.3	Moderate-----	0.37			
	47-60	3-18	1.50-1.70	0.6-6.0	0.19-0.21	6.1-8.4	Low----------	0.37			
802B, 802F.											
Orthents											
864, 865.											
Pits											
871B-------------	0-2	20-27	1.30-1.60	0.2-2.0	0.17-0.20	6.6-8.4	Moderate-----	0.37	5	4L	.5-4
Lenzburg	2-60	20-35	1.40-1.70	0.2-0.6	0.11-0.17	7.4-8.4	Moderate-----	0.37			
871G3------------	0-2	20-27	1.30-1.60	0.6-2.0	0.15-0.19	6.6-8.4	Moderate-----	0.28	5	8	.5-4
Lenzburg	2-60	20-35	1.40-1.70	0.2-0.6	0.11-0.17	7.4-8.4	Moderate-----	0.37			
2023B:											
Blount----------	0-14	22-27	1.35-1.55	0.6-2.0	0.20-0.24	5.1-7.3	Low----------	0.43	3	6	2-3
	14-46	35-50	1.40-1.70	0.06-0.6	0.12-0.19	4.5-6.5	Moderate-----	0.43			
	46-50	27-38	1.50-1.70	0.06-0.6	0.12-0.19	6.1-7.8	Moderate-----	0.43			
	50-60	27-38	1.60-1.85	0.06-0.6	0.07-0.10	7.4-8.4	Moderate-----	0.43			
Urban land.											
2146A:											
Elliott---------	0-18	24-27	1.10-1.30	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.28	4	6	4-5
	18-39	35-50	1.30-1.60	0.2-0.6	0.11-0.20	5.6-7.8	Moderate-----	0.28			
	39-60	27-40	1.60-1.75	0.06-0.6	0.07-0.10	7.4-8.4	Moderate-----	0.43			
Urban land.											
2152:											
Drummer---------	0-16	27-35	1.10-1.30	0.6-2.0	0.21-0.23	5.6-7.8	Moderate-----	0.28	5	7	5-7
	16-57	20-35	1.20-1.45	0.6-2.0	0.21-0.24	5.6-7.8	Moderate-----	0.28			
	57-60	15-32	1.40-1.70	0.6-2.0	0.11-0.19	6.6-8.4	Low----------	0.28			
Urban land.											
2232:											
Ashkum----------	0-17	35-40	1.20-1.40	0.2-0.6	0.20-0.23	5.6-7.8	High---------	0.28	5	4	5-7
	17-39	35-45	1.30-1.60	0.2-0.6	0.11-0.20	6.1-7.8	High---------	0.28			
	39-60	30-40	1.30-1.60	0.2-0.6	0.18-0.20	6.1-8.4	Moderate-----	0.28			
Urban land.											
2242A:											
Kendall---------	0-11	20-27	1.15-1.30	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.37	5	6	1-3
	11-44	27-35	1.30-1.50	0.6-2.0	0.18-0.20	4.5-7.3	Moderate-----	0.37			
	44-60	10-25	1.55-1.70	0.6-2.0	0.11-0.22	5.6-8.4	Low----------	0.37			
Urban land.											

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodi-bility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
2291B:											
Xenia-----------	0-10	11-22	1.30-1.50	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.37	5	5	1-3
	10-32	27-35	1.45-1.65	0.6-2.0	0.18-0.20	5.1-7.3	Moderate-----	0.37			
	32-49	24-35	1.45-1.65	0.2-0.6	0.15-0.19	5.6-7.3	Moderate-----	0.37			
	49-60	12-20	1.70-1.90	0.2-0.6	0.05-0.10	7.4-8.4	Low----------	0.37			
Urban land.											
2570B:											
Martinsville----	0-11	8-20	1.30-1.45	0.6-2.0	0.20-0.24	5.1-7.3	Low----------	0.37	5	5	1-2
	11-43	20-33	1.40-1.60	0.6-2.0	0.16-0.20	5.1-6.5	Moderate-----	0.37			
	43-47	15-25	1.40-1.60	0.6-2.0	0.12-0.17	5.1-6.5	Low----------	0.24			
	47-60	2-20	1.50-1.70	0.6-6.0	0.08-0.17	5.6-8.4	Low----------	0.24			
Urban land.											
7304A, 8304------ Landes	0-16	7-20	1.40-1.60	2.0-6.0	0.13-0.20	6.1-8.4	Low----------	0.20	4	3	1-2
	16-24	5-18	1.60-1.70	2.0-6.0	0.10-0.15	6.1-8.4	Low----------	0.32			
	24-60	5-18	1.60-1.80	6.0-20	0.05-0.15	6.1-8.4	Low----------	0.20			

TABLE 18.--SOIL AND WATER FEATURES

("Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months		Uncoated steel	Concrete
					Ft					
17---------------- Keomah	C	None---------	---	---	2.0-4.0	Apparent	Nov-Jul	High-----	High-----	Moderate.
23A, 23B2--------- Blount	C	None---------	---	---	1.0-3.0	Perched	Mar-May	High-----	High-----	High.
27C3, 27F--------- Miami	B	None---------	---	---	>6.0	---	---	Moderate	Moderate	Moderate.
43---------------- Ipava	B	None---------	---	---	1.0-3.0	Apparent	Mar-Jun	High-----	High-----	Moderate.
56B2-------------- Dana	B	None---------	---	---	3.0-6.0	Perched	Mar-Apr	High-----	Moderate	Moderate.
59---------------- Lisbon	B	None---------	---	---	1.0-3.0	Apparent	Mar-May	High-----	High-----	Moderate.
67---------------- Harpster	B/D	None---------	---	---	+.5-2.0	Apparent	Feb-Jun	High-----	High-----	Low.
68---------------- Sable	B/D	None---------	---	---	+.5-2.0	Apparent	Mar-Jun	High-----	High-----	Low.
69---------------- Milford	B/D	None---------	---	---	+.5-2.0	Apparent	Mar-Jun	High-----	High-----	Low.
88B--------------- Sparta	A	None---------	---	---	>6.0	---	---	Low------	Low------	Moderate
91A, 91B2, 91C2--- Swygert	C	None---------	---	---	1.0-3.0	Perched	Feb-May	High-----	High-----	Low.
102--------------- La Hogue	B	None---------	---	---	1.0-3.0	Apparent	Feb-Jun	High-----	High-----	Moderate.
107--------------- Sawmill	B/D	Frequent----	Brief or long.	Mar-Jun	0-2.0	Apparent	Mar-Jun	High-----	High-----	Low.
125--------------- Selma	B/D	None---------	---	---	+.5-2.0	Apparent	Mar-Jun	High-----	High-----	Low.
131B-------------- Alvin	B	None---------	---	---	>6.0	---	---	Moderate	Low------	High.
132--------------- Starks	C	None---------	---	---	1.0-3.0	Apparent	Mar-Jun	High-----	High-----	Moderate.
134B-------------- Camden	B	None---------	---	---	>6.0	---	---	High-----	Low------	Moderate.
145B2------------- Saybrook	B	None---------	---	---	4.0-6.0	Apparent	Mar-Jun	High-----	High-----	Moderate.
146A, 146B2------- Elliott	C	None---------	---	---	1.0-3.0	Apparent	Mar-May	High-----	High-----	Moderate.

TABLE 18.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months		Uncoated steel	Concrete
					Ft					
147A, 147B2: Clarence	D	None	---	---	1.0-3.0	Perched	Feb-May	Moderate	High	Low.
148A, 148B: Proctor	B	None	---	---	2.5-6.0	Apparent	Mar-Jun	High	Moderate	Moderate.
148C2: Proctor	B	None	---	---	>6.0	---	---	High	Moderate	Moderate.
149: Brenton	B	None	---	---	1.0-3.0	Apparent	Mar-Jun	High	High	Moderate.
150B, 150C2: Onarga	B	None	---	---	>6.0	---	---	Moderate	Low	High.
152: Drummer	B/D	None	---	---	+.5-2.0	Apparent	Mar-Jun	High	High	Moderate.
153: Pella	B/D	None	---	---	+.5-2.0	Apparent	Mar-Jun	High	High	Low.
154: Flanagan	B	None	---	---	1.5-3.5	Apparent	Mar-Jun	High	High	Moderate.
171B: Catlin	B	None	---	---	3.5-6.0	Apparent	Feb-May	High	High	Moderate.
182: Peotone	B/D	None	---	---	+1-1.0	Apparent	Feb-Jul	High	High	Moderate.
183: Shaffton	B	Frequent	Brief	Jan-Apr	2.0-4.0	Apparent	Apr-Jul	Moderate	High	High.
194C2, 194D3: Morley	C	None	---	---	3.0-6.0	Perched	Mar-May	Moderate	High	Moderate.
194F, 194G: Morley	C	None	---	---	>6.0	---	---	Moderate	High	Moderate.
198: Elburn	B	None	---	---	1.0-3.0	Apparent	Mar-May	High	High	Moderate.
199B: Plano	B	None	---	---	>6.0	---	---	High	Moderate	Low.
221C3: Parr	B	None	---	---	>6.0	---	---	Moderate	High	Moderate.
223B2, 223C2: Varna	C	None	---	---	3.0-6.0	Perched	Mar-May	High	Moderate	Moderate.
224G: Strawn	B	None	---	---	>6.0	---	---	Moderate	Moderate	Moderate.
230: Rowe	D	None	---	---	+.5-1.0	Apparent	Mar-Jun	Moderate	High	Low.
232: Ashkum	B/D	None	---	---	+1-2.0	Apparent	Apr-Jun	High	High	Moderate.
233B: Birkbeck	B	None	---	---	3.0-6.0	Apparent	Mar-May	High	High	Moderate.

TABLE 18.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	High water table: Depth	High water table: Kind	High water table: Months	Potential frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
					Ft					
235---------------- Bryce	D	None---------	---	---	+1-1.0	Apparent	Mar-Jun	High-----	High-----	Low.
236---------------- Sabina	C	None---------	---	---	1.5-3.5	Apparent	Mar-Jun	High-----	High-----	Moderate.
238---------------- Rantoul	D	None---------	---	---	+1-1.0	Perched	Mar-Jun	Moderate	High-----	Low.
241C--------------- Chatsworth	D	None---------	---	---	>6.0	---	---	Moderate	High-----	Low.
242---------------- Kendall	B	None---------	---	---	1.0-3.0	Apparent	Mar-Jun	High-----	High-----	Moderate.
291B--------------- Xenia	B	None---------	---	---	2.0-3.5	Apparent	Mar-Jun	High-----	High-----	Moderate.
293---------------- Andres	B	None---------	---	---	1.0-3.0	Apparent	Mar-Jun	High-----	High-----	Low.
294B--------------- Symerton	B	None---------	---	---	3.5-6.0	Apparent	Mar-May	Moderate	High-----	Moderate.
295---------------- Mokena	C	None---------	---	---	1.0-3.0	Perched	Mar-Jun	High-----	High-----	Moderate.
302---------------- Ambraw	B/D	Frequent-----	Brief or long.	Mar-Jun	0-2.0	Apparent	Mar-Jun	High-----	High-----	Moderate.
330---------------- Peotone	B/D	None---------	---	---	+.5-1.0	Apparent	Feb-Jul	High-----	High-----	Moderate.
362---------------- Whitaker Variant	C	None---------	---	---	1.0-3.0	Apparent	Mar-Jun	High-----	High-----	Moderate.
387B--------------- Ockley	B	None---------	---	---	>6.0	---	---	Moderate	Moderate	Moderate.
398---------------- Wea	B	None---------	---	---	>6.0	---	---	Moderate	Moderate	Moderate.
430---------------- Raddle	B	Rare---------	---	---	>6.0	---	---	High-----	Moderate	Moderate.
440A, 440B, 440C2- Jasper	B	None---------	---	---	>6.0	---	---	Moderate	Moderate	High.
448B--------------- Mona	B	None---------	---	---	2.5-4.0	Perched	Mar-Jun	Moderate	High-----	Moderate.
473---------------- Rossburg	B	Rare---------	---	---	>6.0	---	---	Moderate	Low------	Low.
481---------------- Raub	C	None---------	---	---	1.0-3.0	Apparent	Mar-Jun	High-----	High-----	Moderate.
490---------------- Odell	B	None---------	---	---	1.0-3.0	Apparent	Mar-Jun	High-----	High-----	Moderate.
495B2-------------- Corwin	B	None---------	---	---	2.0-4.0	Apparent	Mar-Jun	Moderate	High-----	Moderate.

TABLE 18.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months		Uncoated steel	Concrete
					Ft					
496A, 496B2------- Fincastle	C	None--------	---	---	1.0-3.0	Apparent	Mar-Jun	High-----	High-----	Moderate.
533. Urban land										
536. Dumps										
549G-------------- Marseilles	B	None--------	---	---	>6.0	---	---	High-----	High-----	Moderate.
570B, 570C2, 570F- Martinsville	B	None--------	---	---	>6.0	---	---	Moderate	Moderate	Moderate.
571--------------- Whitaker	C	None--------	---	---	1.0-3.0	Apparent	Mar-Jun	High-----	High-----	Moderate.
802B, 802F. Orthents										
864, 865. Pits										
871B, 871G3------- Lenzburg	B	None--------	---	---	>6.0	---	---	Moderate	Moderate	Low.
2023B: Blount-----------	C	None--------	---	---	1.0-3.0	Perched	Mar-May	High-----	High-----	High.
Urban land.										
2146A: Elliott----------	C	None--------	---	---	1.0-3.0	Apparent	Mar-May	High-----	High-----	Moderate.
Urban land.										
2152: Drummer----------	B/D	None--------	---	---	+.5-2.0	Apparent	Mar-Jun	High-----	High-----	Moderate.
Urban land.										
2232: Ashkum-----------	B/D	None--------	---	---	+1-2.0	Apparent	Apr-Jun	High-----	High-----	Moderate.
Urban land.										
2242A: Kendall----------	B	None--------	---	---	1.0-3.0	Apparent	Mar-Jun	High-----	High-----	Moderate.
Urban land.										
2291B: Xenia------------	B	None--------	---	---	2.0-6.0	Apparent	Mar-Jun	High-----	High-----	Moderate.
Urban land.										
2570B: Martinsville-----	B	None--------	---	---	>6.0	---	---	Moderate	Moderate	Moderate.
Urban land.										

TABLE 18.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months		Uncoated steel	Concrete
					Ft					
7304A------------- Landes	B	Rare--------	---	---	>6.0	---	---	Moderate	Low------	Low.
8304-------------- Landes	B	Occasional	Brief-----	Jan-Jun	>6.0	---	---	Moderate	Low------	Low.

TABLE 19.--ENGINEERING INDEX TEST DATA

(Dashes indicate that data were not available. A blank indicates that the test was not made. MAX means maximum dry density; OPT, optimum moisture; LL, liquid limit; PI, plasticity index; UN, Unified; and NP, nonplastic)

Soil name	Sample number	Horizon	Depth	Moisture density MAX	Moisture density OPT	Percentage passing sieve-- No. 4	No. 10	No. 40	No. 200	LL	PI	Classification AASHTO	Classification UN
			In	Lb/ cu ft	Pct					Pct			
Kendall silt loam-----	84IL-183-5-1	Ap	0-7	102.7	17.7	100.0	99.6	95.3	82.9	32.0	11.5	A-6(9)	CL
	5-4	Bt2	25-36	102.5	21.1	100.0	99.9	98.3	93.7	50.2	28.4	A-7-6(30)	CH
	5-7	2C	49-60	119.9	11.9	100.0	99.8	84.3	23.1	19.5	2.7	A-4(0)	SM
Landes sandy loam-----	83IL-183-29-1	Ap	0-7	119.8	11.9	100.0	99.9	99.1	45.7	18.6	3.7	A-4(0)	SM
	29-3	Bw1	16-24	119.4	11.9	100.0	99.9	98.8	51.1	19.9	4.3	A-4(0)	CL-ML
	29-6	C2	41-60	112.7	11.8	100.0	99.9	88.2	12.3	---	NP	A-2-4(0)	SM
Lenzburg gravelly loam	83IL-183-64-2	C1	1-18	131.0	8.8	80.3	73.0	62.9	41.0	19.7	2.4	A-4(0)	SM
	64-4	C3	28-33	95.4	34.8	98.1	96.1	95.1	89.4	54.6	28.5	A-7-6(29)	CH
Martinsville loam-----	84IL-183-1-1	Ap	0-7	118.6	11.1	99.4	99.1	92.0	49.0	18.5	3.4	A-4(0)	SM
	1-4	Bt2	17-30	121.3	11.5	100.0	99.8	92.0	46.4	23.2	10.2	A-6(1)	CL
	1-7	C	58-65	121.3	10.7	99.8	99.4	82.8	22.0	---	NP	A-2-4(0)	SM
Mona silt loam--------	83IL-183-32-1	Ap	0-12	106.5	18.3	99.5	98.9	96.3	88.4	36.6	16.6	A-6(15)	CL
	32-3	2Bt2	22-29	104.3	19.0	99.3	97.7	93.6	70.8	43.7	29.6	A-7-6(16)	CL
	32-6	3C	38-60	109.6	18.4	98.7	97.9	95.5	91.0	40.9	21.8	A-7-6(20)	CL
Morley silt loam------	84IL-183-112-1	A	0-5	89.1	25.2	100.0	99.9	99.0	94.9	43.7	13.9	A-7-6(16)	ML
		Bt2	18-26		18.0	98.6	97.9	95.2	86.1	40.8	21.6	A-6(17)	CL
		C	31-61	110.2	17.4	96.5	95.7	90.5	76.3	39.9	22.1	A-6(16)	CL
Plano silt loam-------	83IL-183-13-1	Ap	0-8	104.4	18.4	100.0	99.8	98.9	94.5	38.0	16.8	A-6(17)	CL
	13-4	Bt1	18-30	100.9	21.3		100.0	99.0	96.4	50.0	26.1	A-7-6(28)	CL
	13-8	2C	56-64	121.8	10.9	100.0	99.9	92.0	28.2	---	NP	A-2-4(0)	SM
Sabina silt loam------	83IL-183-50-2	E	4-10	104.1	12.4	100.0	99.6	95.9	91.8	29.8	8.2	A-4(7)	CL
	50-5	Bt2	24-32	105.4	19.5	100.0	99.9	99.7	90.4	50.2	30.0	A-7-6(33)	CH
	50-10	2C	62-75	127.2	9.2	97.4	93.1	71.7	38.8	17.7	2.1	A-4(0)	SM
Strawn silt loam------	83IL-183-23-2	E	1.5-4	109.2	16.4	98.2	96.3	90.5	77.1	34.8	19.6	A-6(10)	CL
	23-4	Bt	7-15	114.0	14.7	97.9	96.0	91.7	77.5	30.0	12.5	A-6(8)	CL
	23-6	C	18-28	122.1	12.2	97.0	92.9	81.5	63.6	24.1	10.0	A-4(3)	CL
Xenia silt loam-------	83IL-183-24-1	A	0-3	92.6	23.9	100.0	99.8	98.7	95.1	38.2	10.1	A-4(12)	CL
	24-4	Bt	16-26	108.3	17.7	98.6	97.7	95.6	89.8	39.9	20.0	A-6(18)	CL
	24-5	2Bt2	26-38	115.2	14.5	97.6	95.0	87.0	66.0	33.7	17.6	A-6(9)	CL

TABLE 20.--CLASSIFICATION OF THE SOILS

(An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series)

Soil name	Family or higher taxonomic class
Alvin	Coarse-loamy, mixed, mesic Typic Hapludalfs
Ambraw	Fine-loamy, mixed, mesic Fluvaquentic Haplaquolls
Andres	Fine-loamy, mixed, mesic Aquic Argiudolls
Ashkum	Fine, mixed, mesic Typic Haplaquolls
Birkbeck	Fine-silty, mixed, mesic Typic Hapludalfs
Blount	Fine, illitic, mesic Aeric Ochraqualfs
Brenton	Fine-silty, mixed, mesic Aquic Argiudolls
Bryce	Fine, mixed, mesic Typic Haplaquolls
Camden	Fine-silty, mixed, mesic Typic Hapludalfs
Catlin	Fine-silty, mixed, mesic Typic Argiudolls
Chatsworth	Fine, illitic, mesic Typic Eutrochrepts
Clarence	Fine, illitic, mesic Aquic Argiudolls
*Corwin	Fine-loamy, mixed, mesic Typic Argiudolls
*Dana	Fine-silty, mixed, mesic Typic Argiudolls
Drummer	Fine-silty, mixed, mesic Typic Haplaquolls
Elburn	Fine-silty, mixed, mesic Aquic Argiudolls
Elliott	Fine, illitic, mesic Aquic Argiudolls
Fincastle	Fine-silty, mixed, mesic Aeric Ochraqualfs
Flanagan	Fine, montmorillonitic, mesic Aquic Argiudolls
Harpster	Fine-silty, mesic Typic Calciaquolls
Ipava	Fine, montmorillonitic, mesic Aquic Argiudolls
Jasper	Fine-loamy, mixed, mesic Typic Argiudolls
Kendall	Fine-silty, mixed, mesic Aeric Ochraqualfs
Keomah	Fine, montmorillonitic, mesic Aeric Ochraqualfs
La Hogue	Fine-loamy, mixed, mesic Aquic Argiudolls
Landes	Coarse-loamy, mixed, mesic Fluventic Hapludolls
Lenzburg	Fine-loamy, mixed (calcareous), mesic Typic Udorthents
Lisbon	Fine-silty, mixed, mesic Aquic Argiudolls
Marseilles	Fine-silty, mixed, mesic Typic Hapludalfs
Martinsville	Fine-loamy, mixed, mesic Typic Hapludalfs
Miami	Fine-loamy, mixed, mesic Typic Hapludalfs
Milford	Fine, mixed, mesic Typic Haplaquolls
Mokena	Fine-loamy, mixed, mesic Aquic Argiudolls
Mona	Fine-loamy, mixed, mesic Typic Argiudolls
Morley	Fine, illitic, mesic Typic Hapludalfs
Ockley	Fine-loamy, mixed, mesic Typic Hapludalfs
Odell	Fine-loamy, mixed, mesic Aquic Argiudolls
Onarga	Coarse-loamy, mixed, mesic Typic Argiudolls
Orthents	Orthents
*Parr	Fine-loamy, mixed, mesic Typic Argiudolls
Pella	Fine-silty, mixed, mesic Typic Haplaquolls
Peotone	Fine, montmorillonitic, mesic Cumulic Haplaquolls
Plano	Fine-silty, mixed, mesic Typic Argiudolls
Proctor	Fine-silty, mixed, mesic Typic Argiudolls
Raddle	Fine-silty, mixed, mesic Typic Hapludolls
Rantoul	Fine, montmorillonitic, mesic Vertic Haplaquolls
Raub	Fine-silty, mixed, mesic Aquic Argiudolls
Rossburg	Fine-loamy, mixed, mesic Fluventic Hapludolls
Rowe	Fine, mixed, mesic Typic Argiaquolls
Sabina	Fine, montmorillonitic, mesic Aeric Ochraqualfs
Sable	Fine-silty, mixed, mesic Typic Haplaquolls
Sawmill	Fine-silty, mixed, mesic Cumulic Haplaquolls
*Saybrook	Fine-silty, mixed, mesic Typic Argiudolls
Selma	Fine-loamy, mixed, mesic Typic Haplaquolls
Shaffton	Fine-loamy, mixed, mesic Fluvaquentic Hapludolls
Sparta	Sandy, mixed, mesic Entic Hapludolls
Starks	Fine-silty, mixed, mesic Aeric Ochraqualfs
Strawn	Fine-loamy, mixed, mesic Typic Hapludalfs
Swygert	Fine, mixed, mesic Aquic Argiudolls

TABLE 20.--CLASSIFICATION OF THE SOILS--Continued

Soil name	Family or higher taxonomic class
Symerton	Fine-loamy, mixed, mesic Typic Argiudolls
*Varna	Fine, illitic, mesic Typic Argiudolls
Wea	Fine-loamy, mixed, mesic Typic Argiudolls
Whitaker	Fine-loamy, mixed, mesic Aeric Ochraqualfs
Whitaker Variant	Fine-loamy, mixed, mesic Aeric Ochraqualfs
Xenia	Fine-silty, mixed, mesic Aquic Hapludalfs

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