United States
Department of
Agriculture

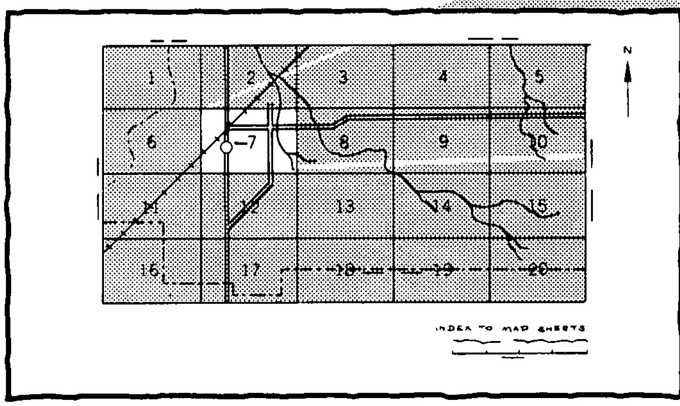
Soil
Conservation
Service

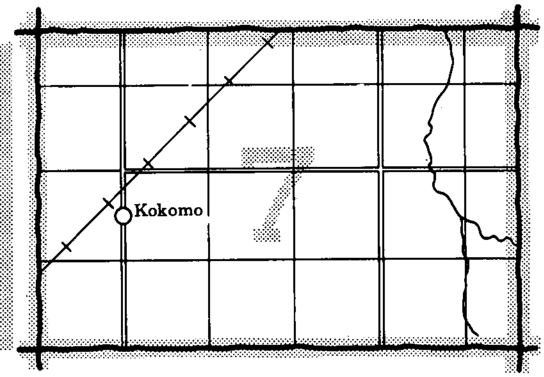
In cooperation with
Illinois Agricultural
Experiment Station

Soil Survey of Morgan and Scott Counties, Illinois

HOW TO USE

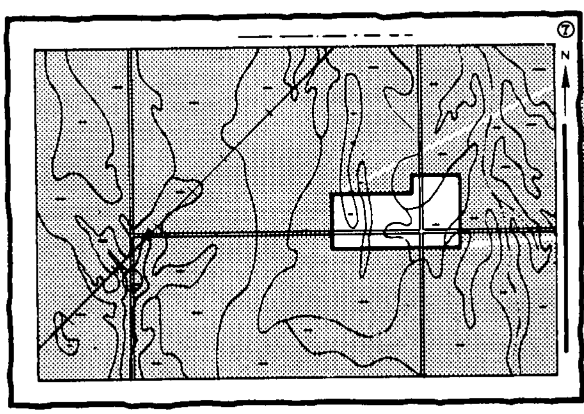
1. Locate your area of interest on the "Index to Map Sheets."

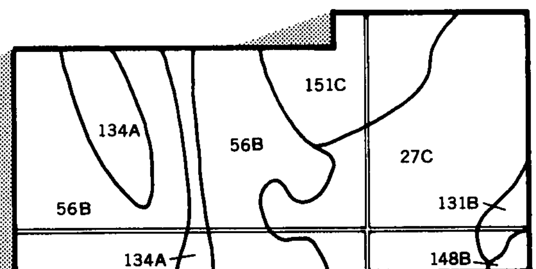




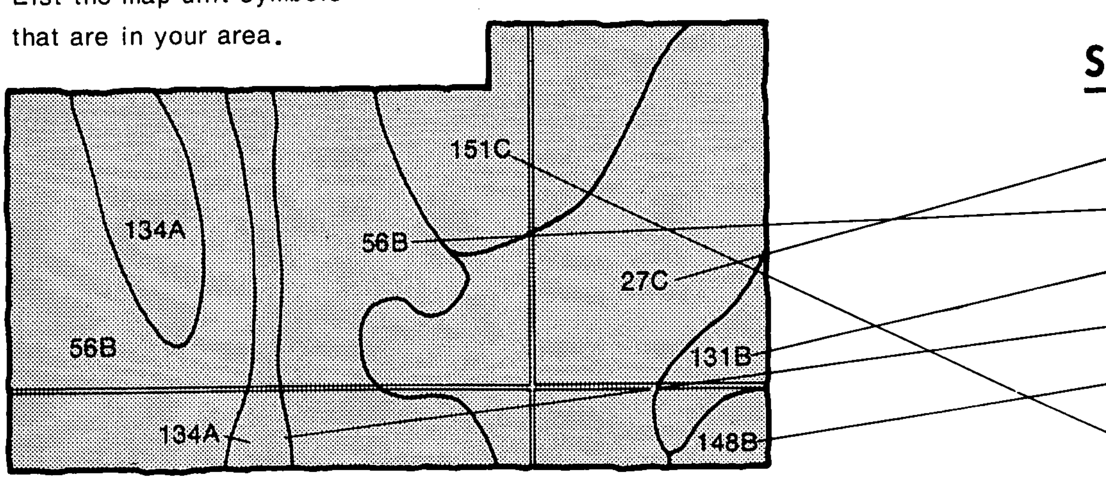
2. Note the number of the map sheet and turn to that sheet.

3. Locate your area of interest on the map sheet.





4. List the map unit symbols that are in your area.



Symbols

27C
56B
131B
134A
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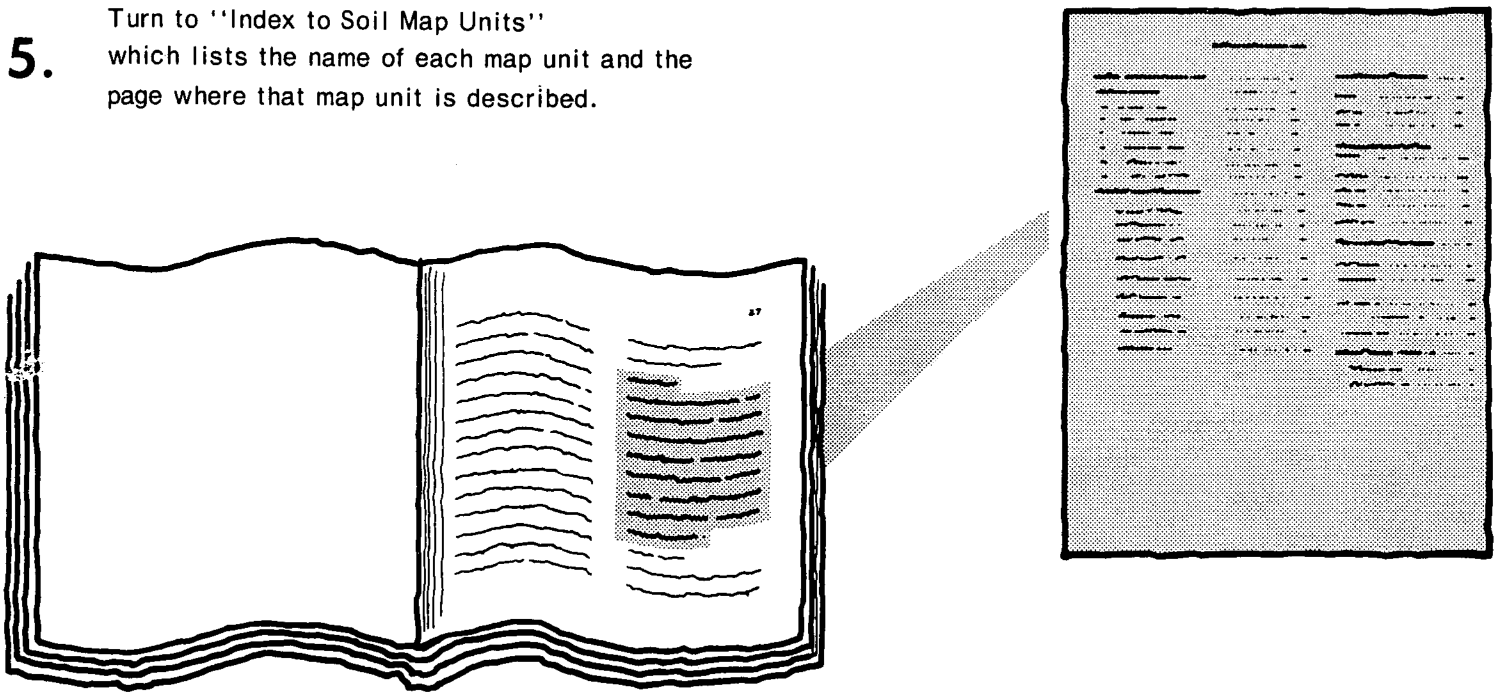
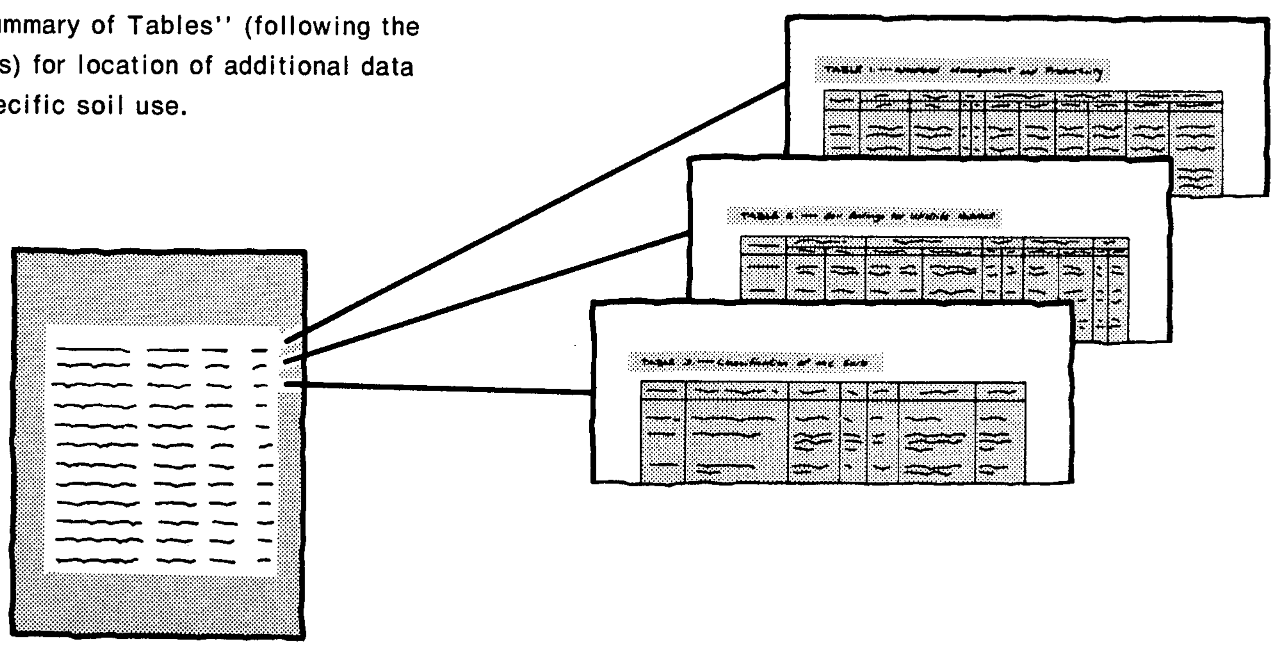
151C

THIS SOIL SURVEY

5. Turn to "Index to Soil Map Units" which lists the name of each map unit and the page where that map unit is described.



6. See "Summary of Tables" (following the Contents) for location of additional data on a specific soil use.



7. Consult "Contents" for parts of the publication that will meet your specific needs. This survey contains useful information for farmers or ranchers, foresters or agronomists; for planners, community decision makers, engineers, developers, builders, or homebuyers; for conservationists, recreationists, teachers, or students; for specialists in wildlife management, waste disposal, or pollution control.

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 Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all, regardless of race, color, national origin, sex, religion, marital status, handicap, or age.

Major fieldwork for this soil survey was completed in 1983. Soil names and descriptions were approved in March 1984. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1983. This survey was made cooperatively by the Soil Conservation Service and the Illinois Agricultural Experiment Station. It is part of the technical assistance furnished to the Soil and Water Conservation Districts in Morgan and Scott Counties. Financial assistance was provided by the Board of Commissioners in the two counties.

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 No. 123.

Cover: Hamburg soils on cone-shaped hills known as "prairie hills." These hills are common along the bluffs in Morgan and Scott Counties. An area of the Worthen-Littleton soil association is in the background.

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Soil Series

Issued September 1988

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Summary of Tables

Foreword

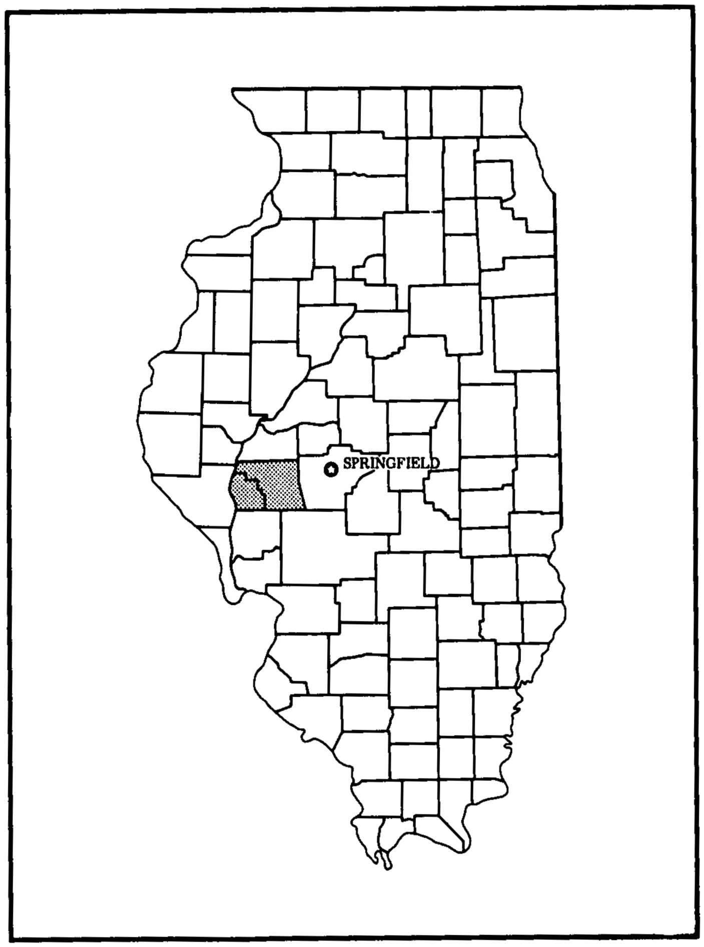
This soil survey contains information that can be used in land-planning programs in Morgan and Scott Counties. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and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

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

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

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

John J. Eckes
State Conservationist
Soil Conservation Service



Location of Morgan and Scott Counties in Illinois.

Soil Survey of
Morgan and Scott Counties, Illinois

By K.A. Gotsch, Soil Conservation Service

Fieldwork by K.A. Gotsch, W.S. Martin, and S.E. Suhl, Soil Conservation Service; L.L. Lewis, Morgan County; and M.K. Martin, Scott County

United States Department of Agriculture, Soil Conservation Service,
in cooperation with
Illinois Agricultural Experiment Station

MORGAN AND SCOTT COUNTIES are in the west-central part of Illinois. The survey area is bounded by Cass County to the north, Macoupin and Greene Counties to the south, Sangamon County to the east, and the Illinois River to the west. Morgan County has an area of 362,880 acres, or about 567 square miles. Scott County has an area of 161,920 acres, or about 253 square miles.

This soil survey updates the survey of Morgan County published in 1929 (*9*). It provides additional information and larger maps, which show the soils in greater detail.

General Nature of the Survey Area

The following paragraphs provide general information about Morgan and Scott Counties. They describe the climate; history and development; and physiography, relief, and drainage.

Climate

Peter Vinzani, Illinois Institute of Natural Resources, State Water Survey Division, helped prepare this section.

Morgan and Scott Counties have a continental climate, which is characterized by relatively cold winters and warm, humid summers. Although precipitation is heaviest during the warmer part of the year, winter snowfall and frost usually result in an adequate amount of soil moisture in the spring. Severe winter storms with heavy accumulations of snow and blowing snow usually occur one or two times each year. Severe thunderstorms, hailstorms, and tornadoes occur most frequently during mid and late spring.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Jacksonville, Illinois, in the period 1951 to 1980. 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 28.9 degrees F, and the average daily minimum temperature is 19.9 degrees. The lowest temperature on record, which occurred at Jacksonville on February 26, 1963, is -17 degrees. In summer the average temperature is 74.1 degrees, and the average daily maximum temperature is 85.4 degrees. The highest recorded temperature, which occurred at Jacksonville on July 14, 1954, is 114 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 (55 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is 37.11 inches. Of this, 23.78 inches, or 64 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 9.61 inches. The heaviest 1-day rainfall during the period of record was 4.53 inches. The average seasonal snowfall is 20.1 inches.

History and Development

Settlers began moving into the survey area soon after Illinois became a state. Morgan County was organized from part of Greene County in 1823. The original boundaries of the county included Cass and Scott Counties. By 1837, Morgan County was the most populous county in the state. Scott County was formed from part of Morgan County in 1839. In 1980, the population of Morgan County was 37,502 and that of Scott County was 6,142 (*5*). Jacksonville, the county seat of Morgan County and major urban center of the survey area, had a population of 20,284. Winchester, the county seat of Scott County, had a population of 1,705.

Farming is the main economic enterprise in the survey area. In 1978, a total of 338,144 acres in Morgan County, or 94 percent of the land area, and 142,979 acres in Scott County, or 89 percent of the land area, was farmland (*13*). The principal crops are corn, soybeans, and wheat. Agriculture is served by grain terminals located at Meredosia and Naples. Grain from the midwestern part of Illinois is transported to these terminals and then is shipped downriver to New Orleans for export. Although most of the land is used for grain production, many farms in both counties have some livestock, mainly hogs and cattle. Alfalfa is the principal hay crop.

The survey area has a variety of large and small industries. Some national companies are headquartered in Jacksonville. The major industries in Scott County include a power station, fertilizer companies, and grain terminals.

The survey area has a well developed network of transportation routes, including U.S. Routes 67, 36, and 54; the Central Illinois Expressway; and Illinois Routes 100, 111, 123, and 267. Secondary roads are generally well maintained. Many of them are graveled or oiled.

Barge service is available on the Illinois River. Barges can dock at the terminals in Meredosia and Naples. Morgan County has a municipal airport north of Jacksonville. Three railroads serve the survey area.

Water resources include the Illinois River and several large lakes. Jacksonville and many smaller towns use the Illinois River as a source of water. The river is also used for boating and fishing. Lake Jacksonville, Mauvaise Terre Lake, and Meredosia Lake are among the largest lakes in the two counties. These lakes are used for fishing, water recreation, and emergency water supplies (*7, 8*).

Physiography, Relief, and Drainage

Most of the soils in the survey area are on loess-covered uplands. The loess varies in thickness. The thickest deposits are in the western part of the survey area. Several small end moraines rise above the upland flats near Jacksonville.

The eastern part of Morgan County generally is nearly level or slightly undulating. The nearly level soils extend to areas near Chapin, Riggston, and Manchester where branching tributaries of the major streams cut into the uplands. Deep valleys that have moderately sloping to very steep side slopes and very narrow upland ridges characterize the northwestern and southern parts of Morgan County and the western half of Scott County. Steep bluffs rise above the bottom land along the Illinois River. This bottom land is nearly level and gently sloping and averages about 3 miles wide.

Elevation along the Illinois River ranges from about 424 feet above sea level on the bottom land to about 600 feet along the bluffs. In the rest of the survey area, elevation commonly ranges from about 600 to 660 feet, but the prominent end moraines southwest of Jacksonville are about 720 feet above sea level.

The survey area is drained by Little Indian, Indian, Mauvaise Terre, Sandy, Apple, and Walnut Creeks. These streams flow west-southwest and drain into the Illinois River. They form an extensive drainage pattern in the uplands and on the bluffs. Where they cross the wide bottom land along the Illinois River, the stream channels have been dredged and straightened. The bottom land is drained primarily by drainage ditches, which are protected from floodwater by levees constructed in the 1930's (fig. 1).

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 biologic activity.

The soils in the survey area occur in an orderly pattern that is related to the geology, the landforms, relief, climate, and the 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 considerable accuracy the kind of soil at a specific location on the landscape.

Figure 1.—A levee along the Illinois River.

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, acidity, 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 interpreted the data from these analyses and tests as well as the field-observed characteristics and the soil properties in terms of expected behavior of the soils under different uses. Interpretations for all of the soils were field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions, and new interpretations sometimes are developed to meet local needs. Data were 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 were 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 state with a fairly high degree of probability 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.

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 several 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

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.

Because of differences in the extent of the major soils, the names of the associations on the general soil map of Morgan and Scott Counties do not completely agree with those on the general soil maps of Greene and Macoupin Counties, which are adjacent to this survey area. Because the soils are similar, however, these differences do not significantly affect the use of the map for general planning of land uses.

The associations in this survey area have been grouped for broad interpretative purposes. The following pages describe the groups of associations in the survey area.

Soil Descriptions

Nearly Level to Moderately Sloping Soils Formed in Loess; on Uplands

These soils are on uplands characterized by low ridges and broad flats. Most of the acreage is cropland. The main management concern is wetness. Farmsteads commonly are on the higher ridges and knolls.

1. Ipava-Tama-Sable Association

Nearly level to moderately sloping soils that are poorly drained to moderately well drained

This association consists of nearly level soils on broad ridges and flats, moderately sloping soils on rounded knolls, and gently sloping soils on the sides of shallow drainageways. The broad ridges have smooth slopes that are 100 to more than 1,000 feet long. Runoff is slow on the flats, which are subject to ponding. Slopes range from 0 to 10 percent.

This association makes up about 33 percent of the survey area. It is about 45 percent Ipava soils, 25 percent Tama soils, 20 percent Sable soils, and 10 percent minor soils (fig. 2).

The nearly level and gently sloping, somewhat poorly drained Ipava soils are on broad ridges and the sides of shallow drainageways. They are higher on the landscape than the Sable soils and lower than the Tama soils. Typically, the surface layer is black, friable silt loam about 9 inches thick. The subsurface layer is black, friable silty clay loam about 9 inches thick. The subsoil is silty clay loam about 36 inches thick. It is mottled and firm. The upper part is dark grayish brown, and the lower part is brown. The underlying material to a depth of 60 inches is light brownish gray, mottled, friable silt loam.

The gently sloping and moderately sloping, moderately well drained Tama soils are on knolls and side slopes above the Ipava and Sable soils. Typically, the surface layer is very dark brown, friable silt loam about 8 inches thick. The subsurface layer is very dark grayish brown, friable silt loam about 6 inches thick. The subsoil extends to a depth of about 60 inches. The upper part is brown, friable silty clay loam. The next part is dark yellowish brown, mottled, firm silty clay loam. The lower part is yellowish brown, mottled, friable silt loam.

The nearly level, poorly drained Sable soils are on low upland flats below the Ipava and Tama soils. Typically, the surface layer is black, friable silty clay loam about 9 inches thick. The subsurface layer is black, mottled, firm silty clay loam about 8 inches thick. The subsoil is about 25 inches thick. It is mottled. The upper part is dark grayish brown, firm silty clay loam. The next part is grayish brown, friable silty clay loam. The lower part is light brownish gray, friable silt loam. The underlying material to a depth of 60 inches is light brownish gray, mottled, friable silt loam.

Minor in this association are the poorly drained Denny and Hartsburg soils. Denny soils are in small, shallow depressions. Hartsburg soils are adjacent to the Sable soils. They are calcareous in the subsoil.

This association is used mainly for the cultivated crops commonly grown in the survey area. It is well suited to those crops. The principal crops are corn and soybeans.

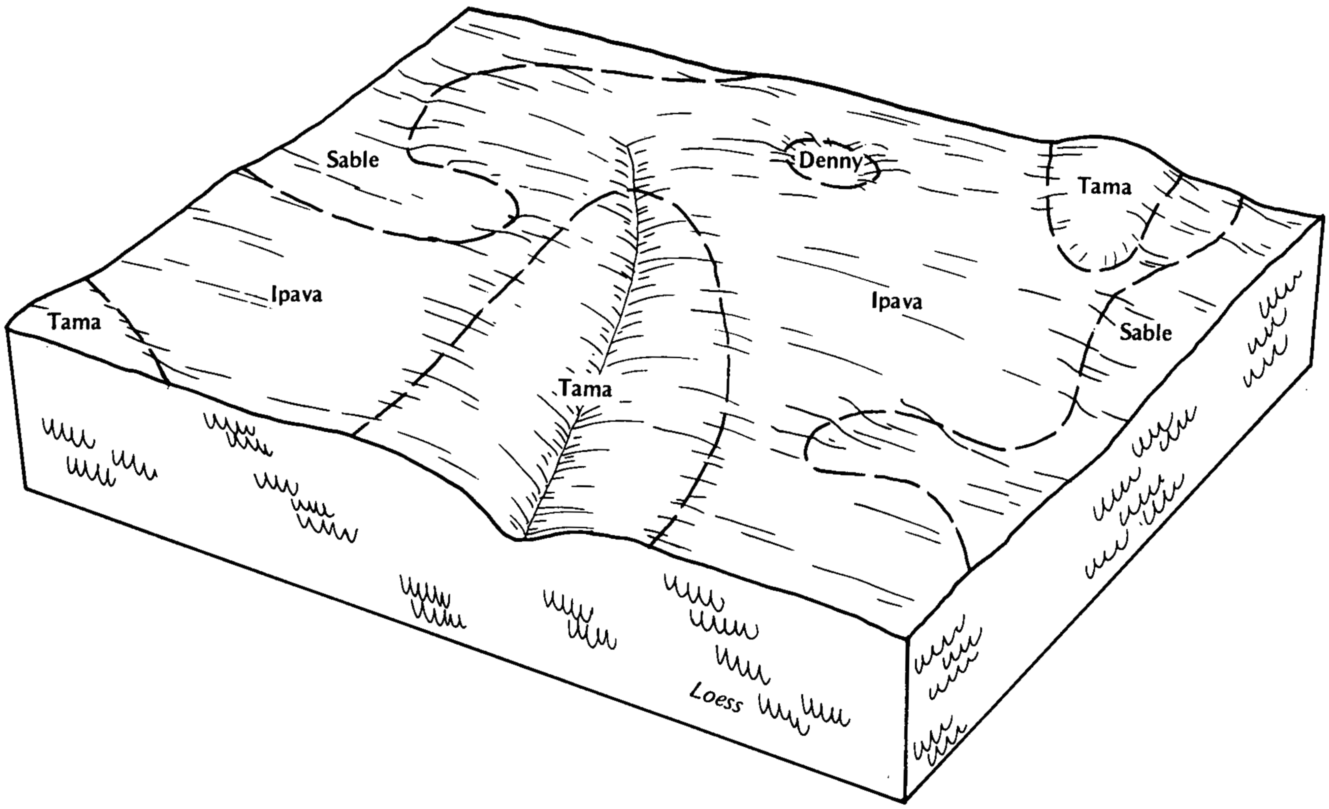


Figure 2.—Pattern of soils and parent material in the Ipava-Tama-Sable association.

Erosion is a hazard in the gently sloping and moderately sloping areas, and wetness is a limitation in the nearly level areas. Measures that control erosion and maintain or improve the drainage system are needed. Subsurface drains and shallow ditches lower the seasonal high water table.

If this association is used as a site for dwellings or septic tank absorption fields, the seasonal high water table, the shrink-swell potential, and restricted permeability are limitations. The slope also is a limitation in the moderately sloping areas. The Ipava and Sable soils are poorly suited to these uses, and the Tama soils are moderately suited.

2. Ipava-Virden Association

Nearly level soils that are somewhat poorly drained and poorly drained

This association consists of soils on broad, low ridges and flats. It generally is not dissected by drainageways. The ridges have smooth slopes that are 100 to more than 1,000 feet long. Runoff is slow on the broad flats, which are subject to ponding. Slopes range from 0 to 2 percent.

This association makes up about 10 percent of the survey area. It is about 40 percent Ipava soils, 25 percent Virden soils, and 35 percent minor soils.

The somewhat poorly drained Ipava soils are on slight rises above the Virden soils. Typically, the surface layer is black, friable silt loam about 9 inches thick. The subsurface layer is black, friable silty clay loam about 9 inches thick. The subsoil is mottled, firm silty clay loam about 36 inches thick. The upper part is dark grayish brown, and the lower part is brown. The underlying material to a depth of 60 inches is light brownish gray, mottled, friable silt loam.

The poorly drained Virden soils are in shallow drainageways and depressions below the Ipava soils. Typically, the surface soil is black, friable silty clay loam about 18 inches thick. The subsoil is mottled, firm silty clay loam about 36 inches thick. The upper part is black, the next part is dark grayish brown, and the lower part is light brownish gray. The underlying material to a depth of 60 inches is light olive gray, mottled, friable silt loam.

Minor in this association are the Denny and Tama soils. The poorly drained Denny soils are in small, shallow depressions surrounded by the Ipava soils. The moderately well drained Tama soils are on small ridges above the Ipava soils.

In most areas this association is cultivated. It is well suited to cultivated crops. The principal crops are corn and soybeans. A few areas are used for wheat. Wetness is a limitation. Subsurface drains and shallow ditches lower the seasonal high water table. Measures that maintain the drainage system are needed.

This association generally is poorly suited to dwellings and septic tank absorption fields. The seasonal high water table and restricted permeability are limitations. Ponding is a hazard on the Virden soils.

Gently Sloping to Very Steep Soils Formed in Loess, Glacial Till, or Loess and Glacial Till; on Uplands

These soils are dominantly on ridges and convex side slopes. The steep and very steep side slopes commonly are wooded. Most of the less sloping areas have been cleared of trees and are used as pasture or cropland. The main management concern is erosion. Farmsteads commonly are on the gently sloping ridges.

3. Rozetta-Hickory-Elco Association

Gently sloping to very steep soils that are moderately well drained and well drained; formed in loess, glacial till, or loess and glacial till

This association consists of gently sloping soils on long, narrow ridges that extend into highly dissected areas of moderately sloping to very steep soils on side slopes. The side slopes are generally short and end abruptly in areas where they adjoin a drainageway or bottom land. Slopes range from 2 to 50 percent.

This association makes up about 30 percent of the survey area. It is about 50 percent Rozetta soils, 20 percent Hickory soils, 10 percent Elco soils, and 20 percent minor soils (fig. 3).

The gently sloping and moderately sloping, moderately well drained Rozetta soils are on ridgetops and side slopes above the Elco and Hickory soils. Typically, the surface soil is brown, friable silt loam about 11 inches thick. The subsoil is about 43 inches thick. The upper part is dark yellowish brown, friable silt loam; the next

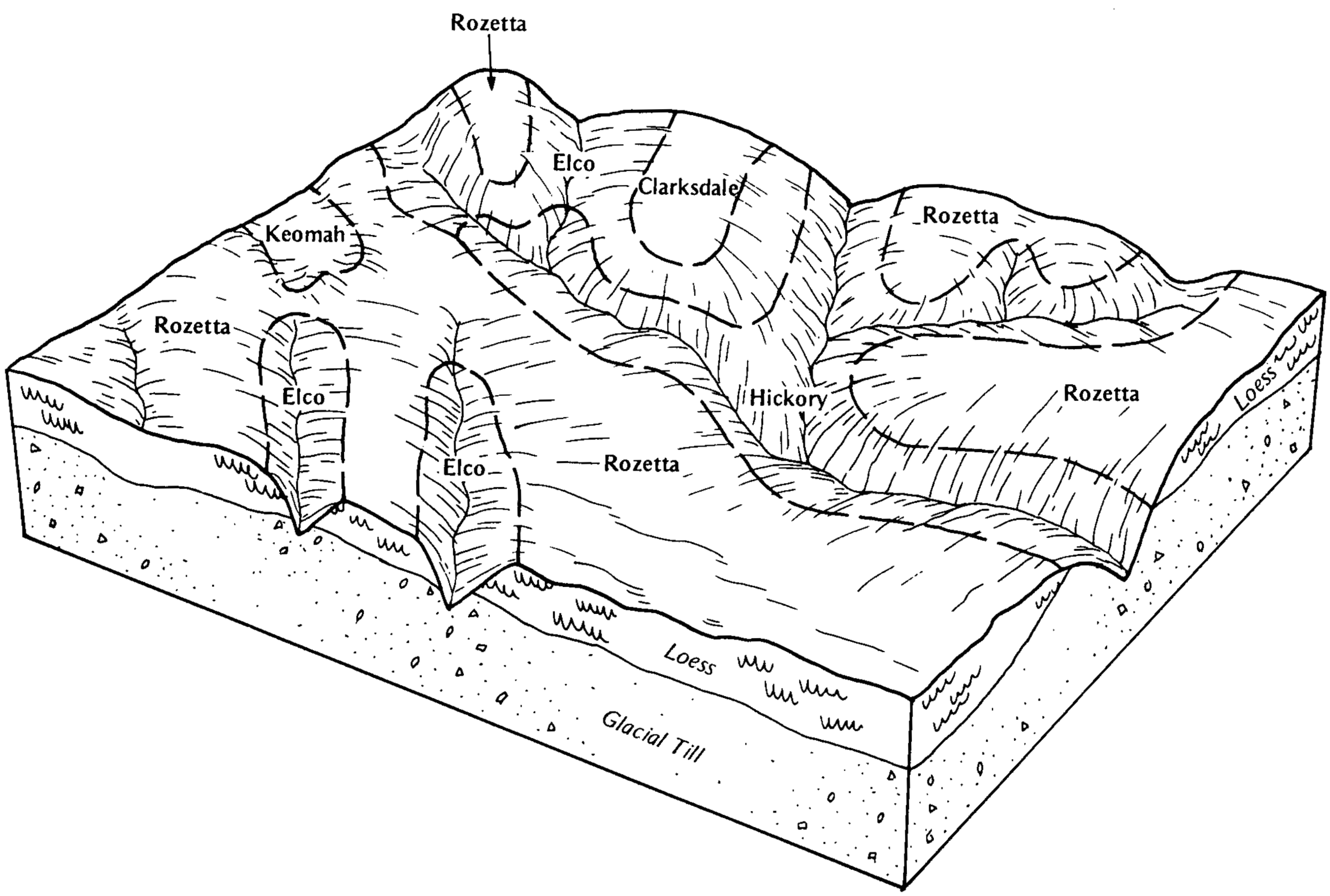


Figure 3.—Pattern of soils and parent material in the Rozetta-Hickory-Elco association.

part is yellowish brown, mottled, firm silty clay loam; and the lower part is yellowish brown, mottled, friable silt loam. The underlying material to a depth of 60 inches is yellowish brown, mottled, friable silt loam.

The steep and very steep, well drained Hickory soils are on side slopes along drainageways. They are lower on the landscape than the Elco and Rozetta soils. Typically, the surface layer is very dark grayish brown, friable silt loam about 3 inches thick. The subsurface layer is brown, friable silt loam about 5 inches thick. The subsoil is about 47 inches thick. It is mottled. The upper part is dark yellowish brown, friable loam; the next part is dark yellowish brown, firm clay loam; and lower part is yellowish brown, firm loam. The underlying material to a depth of 60 inches is light yellowish brown, mottled, friable loam.

The strongly sloping and moderately steep, moderately well drained Elco soils are on side slopes along drainageways. They are lower on the landscape than the Rozetta soils and higher than the Hickory soils. Typically, the surface layer is brown, friable silt loam about 5 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part is yellowish brown, friable silt loam, and the lower part is yellowish brown, brown, and light brownish gray, mottled, firm silty clay loam.

Minor in this association are the somewhat poorly drained Clarksdale, Keomah, and Wakeland soils. Clarksdale and Keomah soils are on the less sloping parts of the ridges. Wakeland soils are on narrow bottom land.

This association is used for cultivated crops, pasture, or woodland. The principal crops are corn, soybeans, and wheat. The gently sloping areas are well suited to cultivated crops, pasture, and hay, and the moderately sloping and strongly sloping areas are moderately suited. Erosion is a hazard. Measures that control erosion and maintain tilth and productivity are needed. The soils are well suited to woodland.

The Rozetta soils are moderately suited to dwellings and septic tank absorption fields. The shrink-swell potential and the seasonal high water table are limitations. The Elco soils are poorly suited to these uses because of moderately slow permeability, the seasonal high water table, the shrink-swell potential, and the slope. The Hickory soils are generally unsuited to these uses because of the slope.

4. Fayette-Sylvan-Bold Association

Gently sloping to steep soils that are well drained; formed in loess

This association consists of soils along bluffs that are deeply dissected by drainageways and streams. The side slopes bordering the major drainageways are long, convex, and smooth. Areas of strong relief parallel the river valley. Relief on the faces of the bluffs is as much as 120 feet. The ridgetops are linear and convex.

This association makes up about 10 percent of the survey area. It is about 35 percent Fayette soils, 30 percent Sylvan soils, 20 percent Bold soils, and 15 percent minor soils (fig. 4).

The gently sloping to steep Fayette soils are on convex ridgetops and side slopes. Typically, the surface soil is brown, friable silt loam about 10 inches thick. The subsoil extends to a depth of 60 inches. It is dark yellowish brown. The upper part is firm silty clay loam, and the lower part is friable silt loam.

The moderately sloping to steep Sylvan soils are on side slopes along drainageways. Typically, the surface layer is exposed subsoil material. It is dark yellowish brown, firm silty clay loam about 6 inches thick. The subsoil is yellowish brown, firm silty clay loam about 19 inches thick. The underlying material to a depth of 60 inches is light brownish gray, mottled, calcareous, friable silt loam.

The strongly sloping to steep Bold soils are on side slopes. Typically, the surface layer is dark yellowish brown, friable silt loam about 5 inches thick. The underlying material to a depth of 60 inches is mottled, calcareous, friable silt loam. The upper part is yellowish brown, and the lower part is pale brown.

Minor in this association are the Alvin, Arenzville, Bloomfield, and Keomah soils. The moderately well drained Arenzville soils are in narrow drainageways and on bottom land. The well drained Alvin soils and the excessively drained Bloomfield soils formed in sandy eolian material on side slopes adjacent to the Fayette soils. The somewhat poorly drained, nearly level Keomah soils are on ridgetops below the Fayette soils.

Most of this association is used for cultivated crops, pasture, or hay. The soils on gently sloping ridgetops are well suited to these uses. The more sloping soils on side slopes are better suited to pasture and hay than to cultivated crops. Erosion is a hazard. Measures that control erosion and maintain or improve the quantity and quality of forage crops are needed. The Bold soils are poorly suited to cultivated crops, pasture, and hay because they are calcareous throughout. Their high pH interferes with the uptake of plant nutrients.

The Fayette and Sylvan soils are well suited to woodland, but the calcareous Bold soils are generally unsuited. Erosion is a hazard. The slope and the seedling mortality rate are limitations. Management that controls erosion during seedling establishment and during harvest periods is needed.

If the steeper areas of this association are used as sites for dwellings and septic tank absorption fields, the slope is a limitation. The shrink-swell potential of the Fayette and Sylvan soils also is a limitation on sites for dwellings.

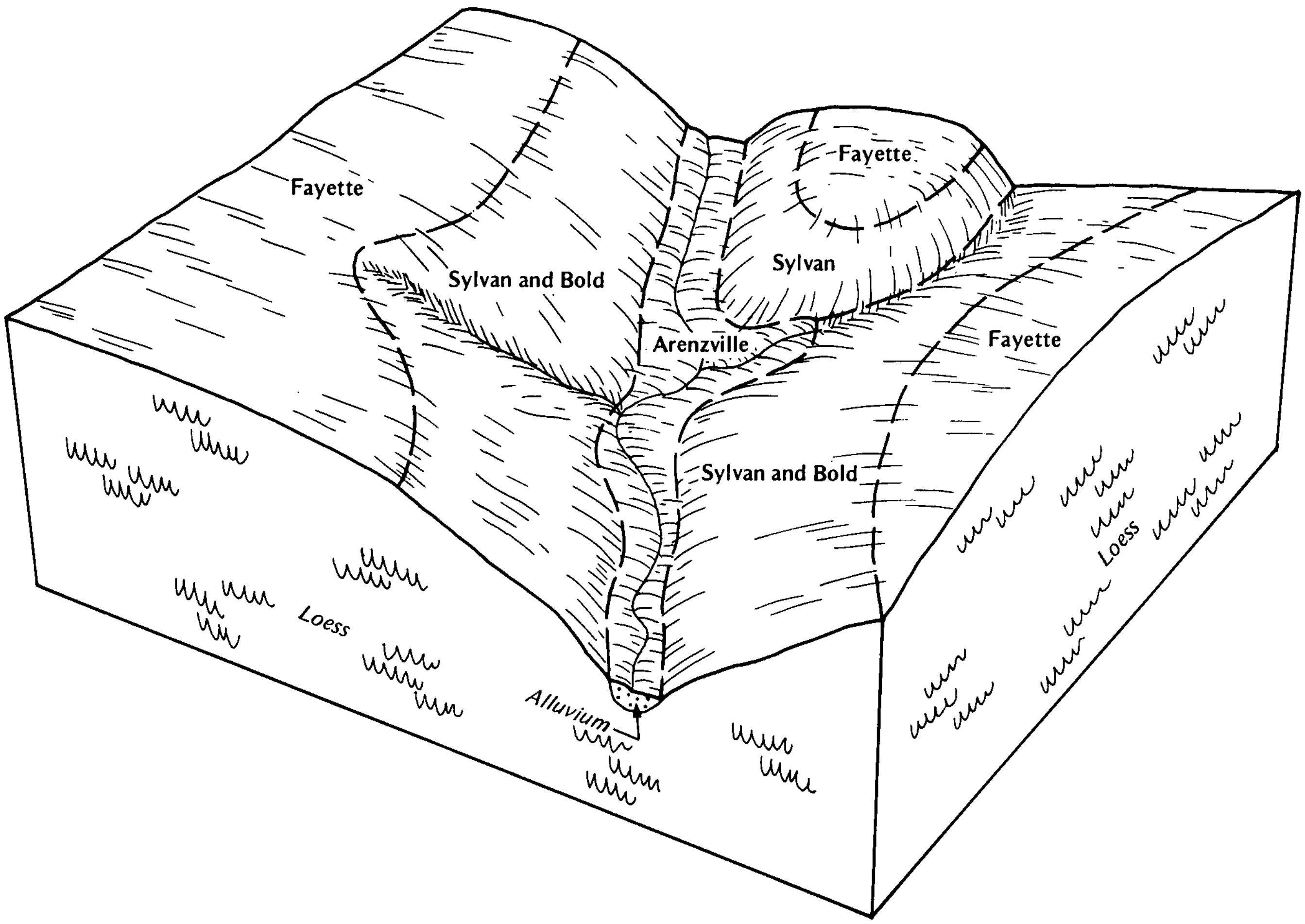


Figure 4.—Pattern of soils and parent material in the Fayette-Sylvan-Bold association.

Nearly Level to Strongly Sloping Soils Formed in Sandy Eolian Material or in Sandy or Loamy Outwash; on Terraces

These soils are on prominent ridges and low terraces. Some of the terraces have a dunelike topography, including distinct ridges and swales. Most of the acreage is cropland. The main management concerns are droughtiness and low fertility.

5. Plainfield-Sparta-Hoopeston Association

Nearly level to strongly sloping soils that are excessively drained and somewhat poorly drained

This association consists of soils on terraces in river valleys. The terraces are linear and parallel the river. Generally, they are low and broad. A few prominent terraces have strongly sloping side slopes. Some areas have prominent ridges and swales, which are long and narrow. Slopes range from 0 to 15 percent.

This association makes up about 3 percent of the survey area. It is about 35 percent Plainfield soils, 25 percent Sparta soils, 15 percent Hoopeston soils, and 25 percent minor soils (fig. 5).

The gently sloping to strongly sloping, excessively drained Plainfield soils are on side slopes and ridgetops on high terraces. Typically, the surface layer is mixed dark brown and dark yellowish brown, loose loamy sand about 9 inches thick. The subsoil is dark yellowish brown, loose sand about 8 inches thick. The underlying material to a depth of 60 inches is yellowish brown, loose sand.

The nearly level and gently sloping, excessively drained Sparta soils are on low terraces and on ridges in areas having a dunelike topography. Typically, the surface layer is very dark grayish brown, loose loamy sand about 8 inches thick. The subsurface layer is dark brown, loose loamy sand about 10 inches thick. The subsoil is loose loamy sand about 19 inches thick. The

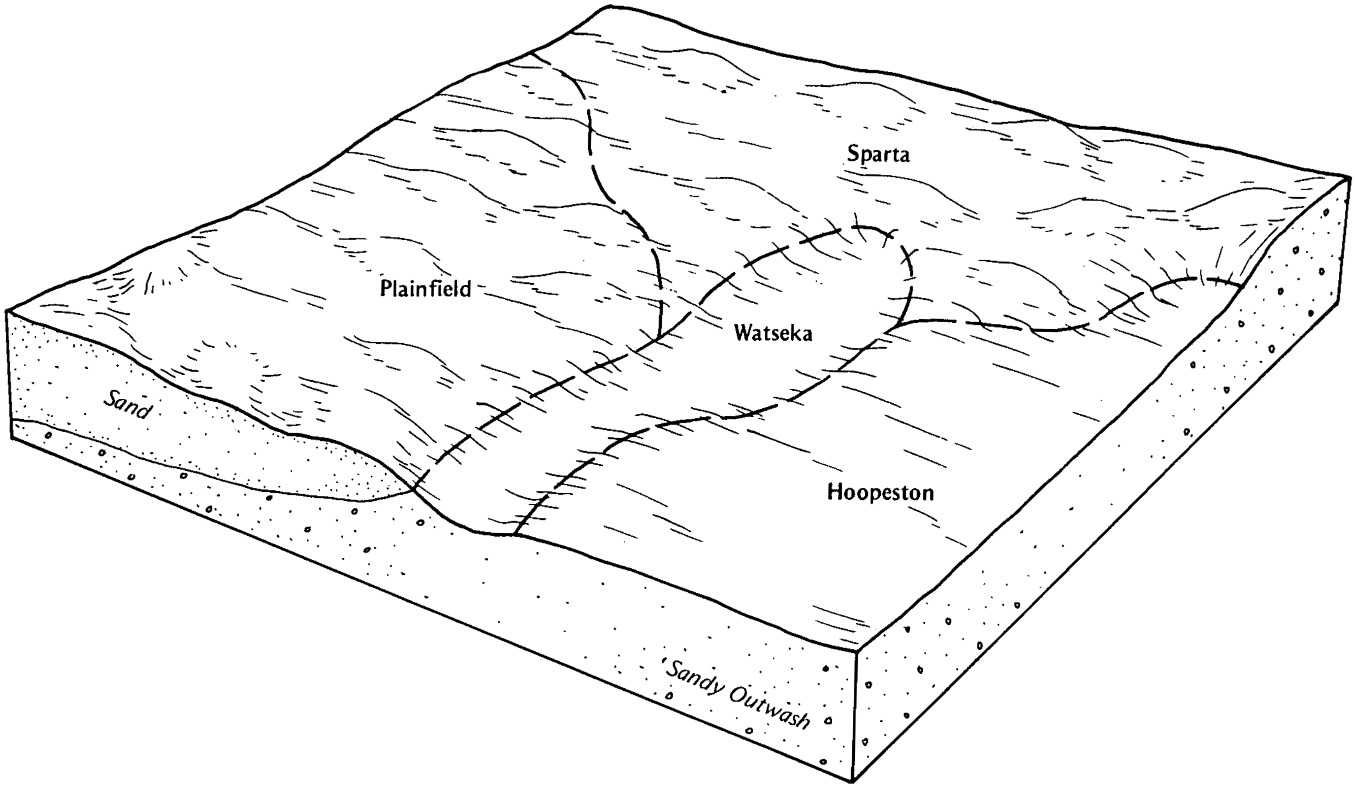


Figure 5.—Pattern of soils and parent material in the Plainfield-Sparta-Hoopeston association.

upper part is brown, and the lower part is dark yellowish brown. The underlying material to a depth of 60 inches is dark yellowish brown, loose sand.

The nearly level, somewhat poorly drained Hoopeston soils are on low terraces. Typically, the surface layer is very dark brown, very friable sandy loam about 10 inches thick. The subsurface layer is very dark grayish brown, very friable sandy loam about 11 inches thick. The subsoil is about 32 inches thick. The upper part is brown, mottled, friable sandy loam. The lower part is dark yellowish brown, mottled, friable sandy loam and loamy sand. The underlying material to a depth of 60 inches is dark yellowish brown, mottled, loose sand that has thin strata of loamy sand.

Minor in this association are the Onarga, Orion, and Watseka soils. The well drained Onarga soils are on low ridges below the Sparta soils. Their subsoil has a higher content of clay than that of the Sparta soils. The poorly drained Orio soils are in slight depressions below the Hoopeston soils. The somewhat poorly drained Watseka soils are in swales below the Plainfield and Sparta soils.

Most of this association is used for small grain or cultivated crops. A few areas are used for pasture or are idle. The principal crops are wheat, soybeans, and corn. The Plainfield and Sparta soils are poorly suited to cultivated crops and pasture, and the Hoopeston soils are moderately suited. Droughtiness and low fertility are limitations. Soil blowing is a hazard. Measures that increase the available water capacity and the organic matter content and control soil blowing are needed.

This association is generally well suited to dwellings, but it is poorly suited to septic tank absorption fields. A poor filtering capacity is a limitation. The seasonal high water table in the Hoopeston soils also is a limitation. The slope is a limitation in some areas.

Nearly Level to Moderately Sloping Soils Formed in Alluvium; on Foot Slopes, Alluvial Fans, and Bottom Land

These soils are on flood plains that have smooth slopes. The main management concerns are flooding and wetness. Areas protected by a levee constructed by the Corps of Engineers are subject to rare or no flooding, and other areas are frequently or occasionally flooded. Most of the acreage is cropland.

6. Worthen-Littleton Association

Nearly level to moderately sloping soils that are on foot slopes and alluvial fans and are well drained and *somewhat poorly drained; formed in silty alluvium*

This association consists of soils on short, concave foot slopes and on alluvial fans. It is along the base of bluffs and along drainageways that extend into the uplands. It extends outward from the bluffs onto broad alluvial fans in river valleys. The Littleton soils are subject to rare flooding.

This association makes up about 3 percent of the survey area. It is about 40 percent Worthen soils, 30 percent Littleton and similar soils, and 30 percent minor soils (fig. 6).

The nearly level to moderately sloping, well drained Worthen soils are on concave foot slopes and alluvial fans. Typically, the surface layer is very dark grayish brown, friable silt loam about 9 inches thick. The subsurface layer is dark brown, friable silt loam about 11 inches thick. The subsoil to a depth of 60 inches is friable silt loam. The upper part is brown, and the lower part is brown and dark yellowish brown.

The nearly level, somewhat poorly drained Littleton soils are on alluvial fans below the Worthen soils. Typically, the surface layer is black, friable silt loam about 9 inches thick. The subsurface layer is friable silt loam about 18 inches thick. The upper part is black, and the lower part is very dark grayish brown. The subsoil is mottled, friable silt loam about 23 inches thick. The upper part is dark brown, and the lower part is dark grayish brown. The underlying material to a depth of 60 inches is light olive brown, mottled, friable silt loam.

Minor in this association are the Beaucoup and Tice soils. The poorly drained, nearly level Beaucoup soils are on bottom land below the Littleton soils. Tice soils are similar to the Littleton soils and are in similar landscape positions.

This association is well suited to cultivated crops. Corn and soybeans are the principal crops. Measures that control erosion are needed on the gently sloping and moderately sloping Worthen soils.

The Worthen soils are well suited to dwellings and septic tank absorption fields. The slope is a limitation in some areas. The Littleton soils are generally unsuited to these uses because of the flooding.

7. Darwin-Beaucoup-Ambraw Association

Nearly level soils that are on bottom land and are very

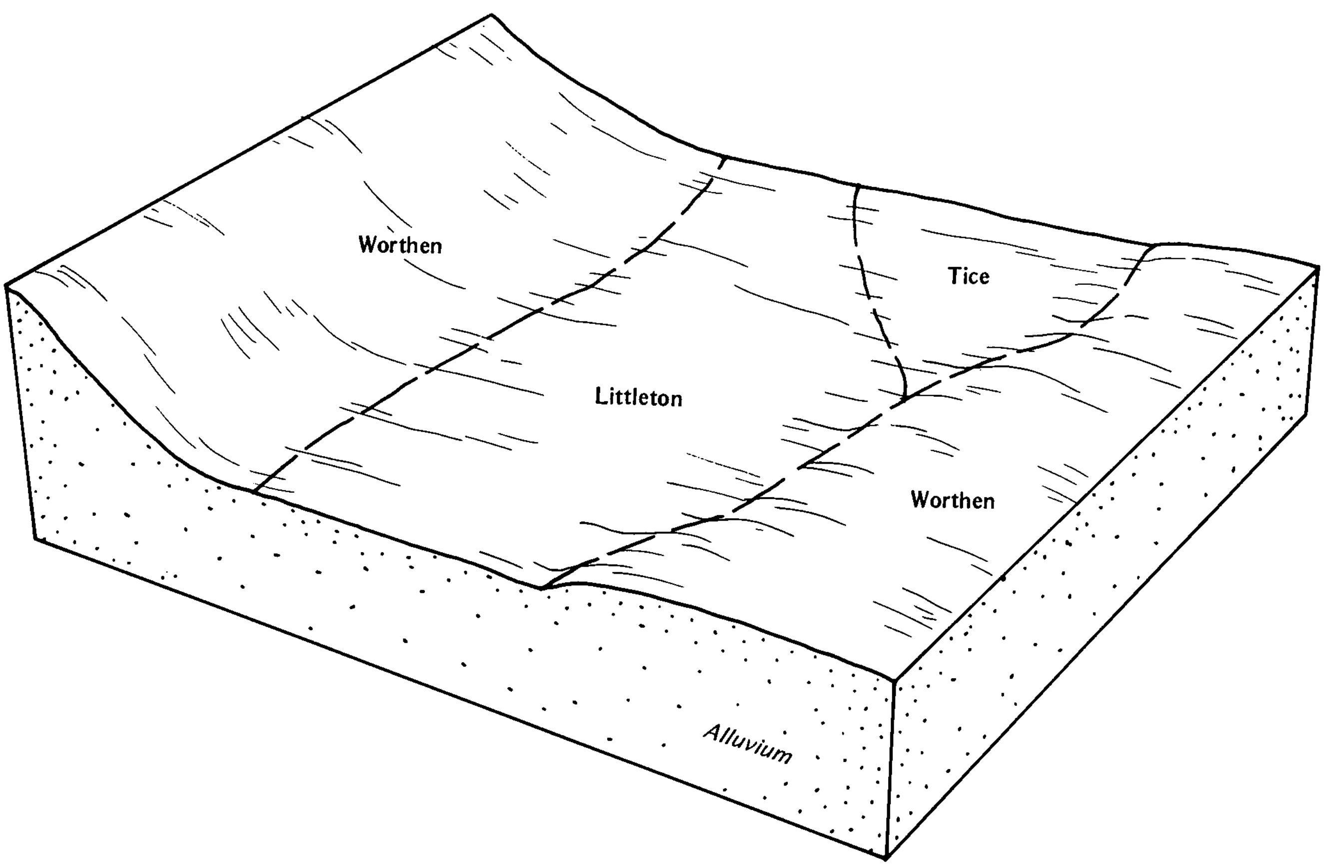


Figure 6.—Pattern of soils and parent material in the Worthen-Littleton association.

poorly drained and poorly drained; formed in clayey, silty, and loamy alluvium

This association consists of soils on flood plains that generally are protected by a levee constructed by the Corps of Engineers. Unprotected areas are frequently flooded for long periods. Some areas have narrow swales, meandering sloughs, and drainage ditches.

This association makes up about 6 percent of the survey area. It is about 30 percent Darwin soils, 20 percent Beaucoup soils, 15 percent Ambraw soils, and 35 percent minor soils (fig. 7).

The very poorly drained Darwin soils formed in clayey alluvium. They are slightly lower on the landscape than the Beaucoup soils. Typically, the surface layer is very dark gray, firm silty clay about 13 inches thick. The subsoil to a depth of 60 inches is mottled, firm silty clay. The upper part is dark gray, the next part is dark grayish brown, and the lower part is gray.

The poorly drained Beaucoup soils formed in silty alluvium. They are slightly higher on the landscape than the Darwin and Ambraw soils. Typically, the surface soil is very dark gray and very dark grayish brown, friable silty clay loam about 12 inches thick. The subsoil is about 34 inches thick. It is mottled. The upper part is dark gray and dark grayish brown, firm silty clay loam. The lower part is grayish brown and light brownish gray, friable silty clay loam and silt loam. The underlying material to a depth of 60 inches is light gray, mottled, friable silt loam.

The poorly drained Ambraw soils formed in loamy alluvium. They are in landscape positions similar to those of the Darwin soils. Typically, the surface layer is very dark gray, firm clay loam about 16 inches thick. The subsoil is about 37 inches thick. It is mottled. The upper part is dark gray, firm clay loam and sandy clay loam; the next part is gray, firm sandy clay loam; and the lower part is dark grayish brown, firm sandy clay loam that has thin strata of loamy sand. The underlying material to a depth of 60 inches is grayish brown, mottled, loose loamy sand.

Minor in this association are the somewhat poorly drained Dupo and Tice and moderately well drained Medway soils. These soils are on low terraces and natural levees and are slightly higher on the landscape than the major soils. Also of minor extent are frequently flooded areas that are not protected by the levee.

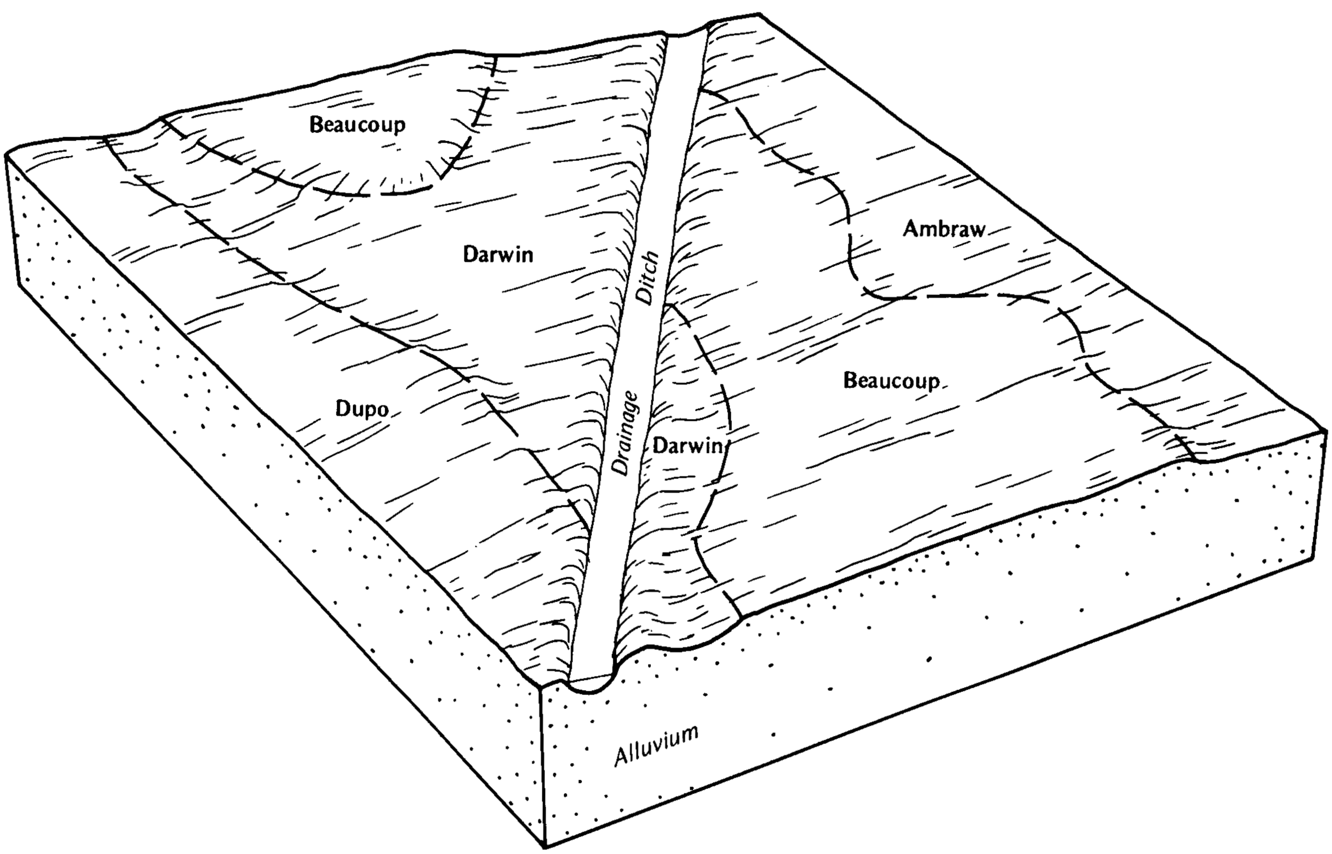


Figure 7.—Pattern of soils and parent material in the Darwin-Beaucoup-Ambraw association.

This association is used primarily for cultivated crops. The principal crops are corn and soybeans. The Darwin soils are moderately suited and the Beaucoup and Ambraw soils well suited to cultivated crops. Ponding is a hazard, and poor tilth is a limitation. Measures that maintain or improve the drainage system, control ponding, improve tilth, and maintain productivity are needed. Subsurface drains and drainage ditches lower the water table.

Because of the flooding, this association is generally unsuited to dwellings and septic tank absorption fields.

8. Lawson-Wakeland-Arenzville Association

Nearly level soils that are on bottom land and are somewhat poorly drained and moderately well drained; formed in silty alluvium

This association consists of soils on bottom land that commonly is flooded for brief periods. The bottom land ranges from 200 feet to 0.25 mile wide. A few of the larger areas on the bottom land have oxbows. In areas where streams are adjacent to the base of uplands, the association does not include both sides of the stream channel.

This association makes up about 5 percent of the survey area. It is about 35 percent Lawson soils, 30 percent Wakeland soils, 15 percent Arenzville soils, and 20 percent minor soils.

The somewhat poorly drained Lawson soils are lower on the landscape than the Arenzville soils and are commonly adjacent to the Wakeland soils. Typically, the surface layer is black, friable silt loam about 11 inches thick. The subsurface layer is black and very dark grayish brown, friable silt loam about 30 inches thick. The underlying material to a depth of 60 inches is brown and dark grayish brown, friable silt loam.

The somewhat poorly drained Wakeland soils are lower on the landscape than the Arenzville soils. Typically, the surface layer is dark grayish brown and brown, friable silt loam about 10 inches thick. The underlying material to a depth of 60 inches is stratified dark grayish brown and brown, mottled, friable silt loam.

The moderately well drained Arenzville soils are adjacent to the base of upland slopes. Typically, the surface layer is brown, friable silt loam about 10 inches thick. The underlying material is about 16 inches of brown, friable silt loam that has thin layers of dark grayish brown and very dark grayish brown material. Below this to a depth of 60 inches is a buried soil of very dark grayish brown and very dark gray, mottled, friable silt loam.

Minor in this association are the Orion and Sawmill soils. The somewhat poorly drained Orion soils are in landscape positions similar to those of the Wakeland soils. The poorly drained Sawmill soils are lower on the bottom land than the Lawson soils.

Most of this association is used for cultivated crops. A few areas are used for pasture. Corn and soybeans are the principal crops. The association is well suited to cultivated crops and pasture, but the flooding is a hazard.

This association is generally unsuited to dwellings and septic tank absorption fields because of the flooding.

Broad Land Use Considerations

The soils of Morgan and Scott Counties vary widely in their suitability for major land uses. About 80 percent of the land in the two counties is used for cultivated crops, mainly corn and soybeans. The major soils in associations 1, 2, 6, 7, and 8 generally are well suited to cultivated crops. Those in association 4 are generally unsuited because of the slope. Those in association 8 are frequently flooded for brief periods in the spring. Measures that control erosion are needed on the Tama soils in association 1 and on the Worthen soils in association 6. The major soils in association 5 differ widely in their suitability for crops. The Hoopeston soils are moderately suited, the Sparta soils are poorly suited, and the Plainfield soils are generally unsuited. The main limitations are droughtiness and low fertility. Also, soil blowing is a hazard. The major soils in association 3 generally are moderately suited to cultivated crops, but the Hickory soils are generally unsuited. Erosion is a hazard, and the slope is a limitation.

About 7 percent of the land in the two counties is used for pasture or hay. The pastured areas are primarily in associations 3 and 4. These associations generally are well suited to grasses and legumes. The slope is a limitation, and erosion is a hazard. The Hickory soils in association 3 generally are poorly suited to pasture because of low productivity.

About 7 percent of the land in the two counties is woodland. The wooded areas are dominantly in associations 3 and 4. The soils in these two associations are generally well suited to woodland, but the Bold soils in association 4 are poorly suited. The main management concerns are plant competition and the equipment limitation. Erosion is a hazard during periods when seedlings are becoming established and during logging periods.

About 4,100 acres in Morgan County has been developed for urban uses. Most of the urban land is in association 1. Most of the major soils in associations 1 and 2 are poorly suited to urban uses, mainly because of a seasonal high water table, the shrink-swell potential, and restricted permeability. The Tama soils in association 1 are moderately suited to building site development. The major soils in associations 3 and 4 have the best potential for urban development. The main limitations are the slope, a seasonal high water table, and the shrink-swell potential. The major soils in association 5 are generally unsuited to septic tank absorption fields because of a poor filtering capacity. The Worthen soils in association 6 are well suited to urban uses. The Littleton soils in association 6 and all of the major soils in associations 7 and 8 are generally unsuited to urban development because of the hazard of flooding.

The potential for recreational uses depends on the intensity of the expected use and the properties of the soil. Associations 3, 4, and 5 have the best potential for recreational development. The main limitation in these associations is the slope.

The potential for wildlife habitat varies throughout the two counties. The soils in the upland associations 1, 2, 3, and 4 generally have good potential for openland or woodland wildlife habitat. Most of the soils in these associations have poor potential for wetland wildlife habitat. In undrained areas, however, some of the soils, such as the Sable soils in association 1, have good potential. The soils on the bottom land in associations 7 and 8 also have good potential unless they are drained. If drained, these soils have good potential for openland and woodland wildlife habitat.

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 "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, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Fayette silt loam, 2 to 5 percent slopes, is a phase in the Fayette series.

Some map units are made up of two or more major soils. These map units are called soil complexes. A *soil complex* consists of two or more soils, or one or more soils and a miscellaneous area, 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 soils are somewhat similar in all areas. Bold-Sylvan silt loams, 15 to 35 percent slopes, eroded, 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, quarry, 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 in each county. 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.

Because of differences in the extent of the soils, the names of some map units in Morgan and Scott Counties do not completely agree with those on the soil maps of Greene and Macoupin Counties, which are adjacent to this survey area. Because the soils are similar, however, these differences do not significantly affect the use of the maps for detailed planning.

Soil Descriptions

8E2—Hickory loam, 15 to 30 percent slopes, eroded. This steep, well drained soil is on side slopes in the uplands. Individual areas are long and irregular in shape and range from 15 to 200 acres in size.

Typically, the surface layer is dark brown, friable loam about 4 inches thick. The subsoil is about 47 inches thick. The upper part is dark yellowish brown, firm clay loam. The next part is yellowish brown, mottled, firm clay loam. The lower part is brown, friable loam. The underlying material to a depth of 60 inches is brown, mottled, friable loam. In some areas the upper part of the soil is more than 20 inches of silty material. In other areas the subsoil has less clay and is calcareous within a depth of 40 inches.

Included with this soil in mapping are small areas of the somewhat poorly drained Lawson and Wakeland soils. These soils are on bottom land below the Hickory soil. They make up 2 to 5 percent of the unit.

Water and air move through the Hickory soil at a moderate rate. Surface runoff is rapid. The available water capacity is high. Organic matter content is moderately low. Reaction is strongly acid to neutral in the subsoil and slightly acid or neutral in the surface layer. The shrink-swell potential and the potential for frost action are moderate.

Most areas are used for pasture. This soil is moderately suited to pasture and hay. It is well suited to woodland. It is generally unsuited to dwellings, septic tank absorption fields, and cultivated crops because of the slope.

Erosion control is needed when grasses and legumes are becoming established in the pastured areas. In areas where the pasture is established, seeding legumes on the contour improves forage quality and helps to control erosion. A permanent cover of pasture plants helps to control erosion and maintains tilth. Selection of suitable species for planting, proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture and the soil in good condition.

If this soil is used as woodland, the erosion hazard and the equipment limitation are management concerns. They are caused by the slope. Plant competition also is a management concern. It affects the seedlings of desirable species. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Logging roads and skid trails should be established on the contour if possible. On the steeper slopes, the logs or trees should be skidded uphill with a cable and winch. Firebreaks should be the grass type. Bare logging areas should be seeded to grass or to a grass-legume mixture. Machinery should be used only when the soil is firm enough to support the equipment. 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 VIe.

8E3—Hickory clay loam, 15 to 30 percent slopes, severely eroded. This steep, well drained soil is on side slopes in the uplands. Individual areas are long and irregular in shape and range from 10 to 100 acres in size.

Typically, the surface layer is exposed subsoil material. It is dark yellowish brown, firm clay loam about 6 inches thick. The subsoil is firm clay loam about 44 inches thick. The upper part is dark yellowish brown, and the lower part is yellowish brown. The underlying material to a depth of 60 inches is pale brown and yellowish brown, mottled, firm loam. In some areas the surface layer is silt loam and is not eroded. In other areas the subsoil is thinner, has less clay, and is calcareous.

Included with this soil in mapping are small areas of the somewhat poorly drained Lawson and Wakeland soils. These soils are on bottom land below the Hickory soil. They make up 2 to 5 percent of the unit.

Water and air move through the Hickory soil at a moderate rate. Surface runoff is rapid. The available water capacity is high. Organic matter content is low. Reaction is neutral in the subsoil and in the surface layer. The shrink-swell potential and the potential for frost action are moderate. Tilth is poor in the surface layer. This layer becomes compact and cloddy if tilled when too wet.

Most areas are used for pasture. Others are idle. This soil is poorly suited to pasture and hay. It is well suited to woodland. It is generally unsuited to cultivated crops, dwellings, and septic tank absorption fields because of the slope.

Establishing pasture and hay crops helps to keep soil loss within tolerable limits. Seedbed preparation is difficult on severely eroded side slopes where the subsoil is exposed. A no-till method of pasture renovation or seeding helps to control further erosion. The plants should not be grazed until they are sufficiently established. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to prevent surface compaction and excessive runoff.

If this soil is used as woodland, the erosion hazard and the equipment limitation are management concerns. They are caused by the slope. Plant competition also is a management concern. It affects the seedlings of desirable species. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Logging roads and skid trails should be established on the contour if possible. On the steeper slopes, the logs or trees should be skidded uphill with a cable and winch. Firebreaks should be the grass type. Bare logging areas should be seeded to grass or to a grass-legume mixture. Machinery should be used only when the soil is firm enough to support the equipment. 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 VIe.

8F—Hickory silt loam, 20 to 50 percent slopes. This very steep, well drained soil is on side slopes in the uplands. Individual areas are long and irregular in shape and range from 25 to 250 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 3 inches thick. The subsurface layer is brown, friable silt loam about 5 inches thick. The subsoil is about 47 inches thick. The upper part is dark yellowish brown, mottled, friable loam; the next part is dark yellowish brown, mottled, firm clay loam; and the lower part is yellowish brown, mottled, firm loam. The underlying material to a depth of 60 inches is light yellowish brown, mottled, friable loam. In some areas the subsoil has less clay and is calcareous within a depth of 40 inches. In places the upper part of the soil is more than 20 inches of silty material.

Included with this soil in mapping are small areas of exposed shale or limestone bedrock at the base of some slopes. Also included are small areas of the somewhat poorly drained Lawson and Wakeland soils on bottom land below the Hickory soil. Included areas make up 5 to 8 percent of the unit.

Water and air move through the Hickory soil at a moderate rate. Surface runoff is very rapid. The available water capacity is high. Organic matter content is moderately low. Reaction is very strongly acid to neutral in the subsoil. It is slightly acid in the surface layer. The shrink-swell potential and the potential for frost action are moderate.

Most areas are wooded. This soil is well suited to woodland and to woodland wildlife habitat. It is generally unsuited to cultivation and to dwellings and septic tank absorption fields because of the slope.

If this soil is used as woodland, the erosion hazard and the equipment limitation are management concerns. They are caused by the slope. Plant competition also is a management concern. It affects the seedlings of desirable species. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Logging roads and skid trails should be established on the contour if possible. On the steeper slopes, the logs or trees should be skidded uphill with a cable and winch. Firebreaks should be the grass type. Bare logging areas should be seeded to grass or to a grass-legume mixture. Machinery should be used only when the soil is firm enough to support the equipment. 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 dense stands of timber provide good habitat for woodland wildlife. This soil is suitable for grain and seed crops, wild herbaceous plants, and hardwood trees. Measures that protect the habitat from fire and grazing help to prevent the depletion of the shrubs and sprouts that provide food for the wildlife.

The land capability classification is VIIe.

17A—Keomah silt loam, 0 to 3 percent slopes. This nearly level, somewhat poorly drained soil is on interstream divides. Individual areas are oval or irregularly shaped and range from 3 to 50 acres in size.

Typically, the surface layer is dark grayish brown, friable silt loam about 9 inches thick. The subsurface layer is grayish brown, friable silt loam about 4 inches thick. The subsoil is mottled silty clay loam about 45 inches thick. The upper part is brown and friable, the next part is yellowish brown and firm, and the lower part is grayish brown and friable. The underlying material to a depth of 60 inches is grayish brown, mottled, friable silt loam. In some areas the surface layer is darker. In other areas the subsoil has less clay.

Included with this soil in mapping are small areas of the poorly drained Virden soils and a few small depressions. Virden soils are in drainageways and low areas below the Keomah soil. The Virden soils and the soils in depressions are subject to ponding. They make up about 5 percent of the unit.

Water and air move through the Keomah soil at a moderately slow rate. Surface runoff is slow. A seasonal high water table is 2 to 4 feet below the surface during spring and early summer. The available water capacity is high. Organic matter content is moderately low. Reaction is very strongly acid or strongly acid in the subsoil. It is neutral in the surface layer as a result of local liming practices. The shrink-swell potential and the potential for frost action are high. The surface layer tends to crust after hard rains.

Most areas are cultivated. Others are used for pasture. This soil is well suited to cultivated crops, pasture, and hay. It is poorly suited to dwellings and septic tank absorption fields.

If drained, this soil can be used for corn, soybeans, and small grain. A drainage system has been installed in most areas. Measures that maintain or improve the drainage system are needed. Surface drains, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. Applying a conservation tillage system that leaves crop residue on the surface after planting and returning crop residue to the soil improve tilth, help to prevent surface compaction and crusting, and increase the rate of water intake.

Adapted forage and hay plants grow well on this soil. Subsurface tile drains can reduce the wetness if suitable outlets are available. Overgrazing or grazing when the soil is too wet reduces forage yields, causes surface compaction and excessive runoff, and increases the susceptibility to erosion. 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 a site for dwellings with basements, the seasonal high water table and the shrink-swell potential are limitations. The shrink-swell potential also is a limitation on sites for dwellings without basements. Installing subsurface tile drains near the foundations helps to overcome the wetness. Extending the footings below the subsoil or 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. Subsurface tile drains lower the water table. Grading and land shaping help to remove surface water. Increasing the size of the filter field or replacing the soil with more permeable material helps to overcome the moderately slow permeability.

The land capability classification is IIw.

19C3—Sylvan silty clay loam, 5 to 10 percent slopes, severely eroded. This moderately sloping, well drained soil is on side slopes in the uplands. Individual areas are long and irregular in shape and range from 3 to 50 acres in size.

Typically, the surface layer is exposed subsoil material. It is dark yellowish brown, friable silty clay loam about 6 inches thick. The subsoil is yellowish brown, firm silty clay loam about 23 inches thick. The underlying material to a depth of 60 inches is light brownish gray, mottled, calcareous, friable silt loam. In some areas the soil is calcareous within a depth of 20 inches.

Water and air move through the Sylvan soil at a moderate rate. Surface runoff is medium. The available water capacity is very high. Organic matter content is low. Reaction is medium acid to neutral in the subsoil. It is neutral in the surface layer as a result of local liming practices. The shrink-swell potential is moderate, and the potential for frost action is high. Tilth is poor in the surface layer. This layer becomes compact and cloddy if tilled when too wet.

Most areas are cultivated. This soil is poorly suited to cultivated crops. It is well suited to woodland. It is moderately suited to dwellings and septic tank absorption fields.

Unless the surface is protected, further erosion is a severe hazard in the areas used for soybeans, corn, or small grain. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, contour farming or terraces, and a crop rotation that is dominated by forage crops. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.

If this soil is used as woodland, plant competition is a management concern. It affects the seedlings of desirable species. The competition in openings where timber has been harvested 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. Measures that protect the woodland from fire are needed.

If this soil is used as a site for dwellings without basements, the shrink-swell potential is a limitation. Also, the slope is a limitation in the more sloping areas. Reinforcing the foundation or extending it below the subsoil helps to overcome the shrink-swell potential. Cutting, filling, and land shaping help to overcome the slope.

The slope is a limitation if the more sloping areas of this soil are used as sites for septic tank absorption fields. Installing the filter lines on the contour or cutting and land shaping help to overcome this limitation.

The land capability classification is IVe.

19D2—Sylvan silt loam, 10 to 15 percent slopes, eroded. This strongly sloping, well drained soil is on side slopes in the uplands. Individual areas are long and irregularly shaped and range from 5 to 50 acres in size.

Typically, the surface layer is brown, friable silt loam about 5 inches thick. The subsoil is about 26 inches thick. It is yellowish brown. The upper part is friable silt loam, the next part is firm silty clay loam, and the lower part is friable silt loam. The underlying material to a depth of 60 inches is yellowish brown and pale brown, calcareous, friable silt loam. In some areas it is not calcareous. In some severely eroded areas, the surface layer has more clay. In a few places the soil is calcareous within a depth of 20 inches.

Water and air move through the Sylvan soil at a moderate rate. Surface runoff is medium. The available water capacity is very high. Organic matter content is moderately low. Reaction is medium acid to neutral in the subsoil and slightly acid in the surface layer. The shrink-swell potential is moderate, and the potential for frost action is high. The surface layer tends to crust after hard rains.

Most areas are used for pasture. Some are used for cultivated crops. This soil is well suited to pasture and hay and to woodland. It is moderately suited to cultivated crops, dwellings, and septic tank absorption fields.

If this soil is used for corn, soybeans, or small grain, further erosion is a hazard. A crop rotation dominated by forage crops and a combination of contour farming and a conservation tillage system that leaves crop residue on the surface after planting help to keep soil loss within tolerable limits. Stripcropping also helps to control erosion. Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and productivity.

Adapted forage and hay crops grow well on this soil. Timely deferment of grazing helps to prevent overgrazing and thus also helps to prevent surface compaction, excessive runoff, and a greater susceptibility to erosion. Tilling on the contour when a seedbed is prepared or the pasture is renovated helps to control erosion. Applications of fertilizer are needed. The plants should not be grazed or clipped until they are sufficiently established.

If this soil is used as woodland, plant competition is a management concern. It affects the seedlings of desirable species. The competition in openings where timber has been harvested 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. Measures that protect the woodland from fire are needed.

If this soil is used as a site for dwellings, the slope is a limitation. On sites for dwellings without basements, the shrink-swell potential also is a limitation. Cutting, filling, and land shaping help to overcome the slope.

Reinforcing the foundation or extending it below the subsoil help to overcome the shrink-swell potential.

The slope is a limitation if this soil is used as a site for septic tank absorption fields. Installing the filter lines on the contour or cutting and land shaping help to overcome this limitation.

The land capability classification is IIIe.

19D3—Sylvan silty clay loam, 10 to 15 percent slopes, severely eroded. This strongly sloping, well drained soil is on side slopes in the uplands. Individual areas are long and irregular in shape and range from 5 to 50 acres in size.

Typically, the surface layer is exposed subsoil material. It is dark yellowish brown, firm silty clay loam about 4 inches thick. The subsoil is about 24 inches thick. It is yellowish brown. The upper part is firm silty clay loam, and the lower part is friable, mottled silt loam. The underlying material to a depth of 60 inches is light olive brown, mottled, calcareous, friable silt loam. In some areas the soil is calcareous within a depth of 20 inches.

Water and air move through the Sylvan soil at a moderate rate. Surface runoff is rapid. The available water capacity is very high. Organic matter content is low. Reaction is medium acid or slightly acid in the subsoil and slightly acid in the surface layer. The shrink-swell potential is moderate, and the potential for frost action is high. Tilth is poor in the surface layer. This layer becomes compact and cloddy if tilled when too wet.

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

Unless the surface is protected, further erosion is a severe hazard in the areas used for corn, soybeans, or small grain. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, contour farming, terraces, and a crop rotation that is dominated by forage crops. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and help to maintain tilth.

Establishing pasture and hay crops helps to keep soil loss within tolerable limits. Seedbed preparation is difficult on severely eroded side slopes where the subsoil is exposed. A no-till method of pasture renovation or seeding helps to control further erosion. The plants should not be grazed until they are sufficiently established. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to prevent surface compaction and excessive runoff.

If this soil is used as woodland, plant competition is a management concern. It affects the seedlings of desirable species. The competition in openings where timber has been harvested 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. Measures that protect the woodland from fire are needed.

If this soil is used as a site for dwellings, the slope is a limitation. On sites for dwellings without basements, the shrink-swell potential also is a limitation. Cutting, filling, and land shaping help to overcome the slope. Reinforcing the foundation or extending it below the subsoil help to overcome the shrink-swell potential.

The slope is a limitation if this soil is used as a site for septic tank absorption fields. Installing the filter lines on the contour or cutting and land shaping help to overcome this limitation.

The land capability classification is IVe.

19E2—Sylvan silt loam, 15 to 30 percent slopes, eroded. This steep, well drained soil is on side slopes in the uplands. Individual areas are long and irregular in shape and range from 10 to 75 acres in size.

Typically, the surface layer is dark brown and dark yellowish brown, friable silt loam about 4 inches thick. The subsoil is about 24 inches thick. The upper part is dark yellowish brown, friable silt loam and silty clay loam, and the lower part is yellowish brown, firm silty clay loam. The underlying material to a depth of 60 inches is pale brown and yellowish brown, calcareous, friable silt loam. In some areas it is not calcareous. In other areas the soil is calcareous within a depth of 20 inches. In a few places it contains more sand.

Water and air move through the Sylvan soil at a moderate rate. Surface runoff is rapid. The available water capacity is very high. Organic matter content is moderately low. Reaction is slightly acid in the subsoil and surface layer. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are used for pasture. Some are used for cultivated crops. This soil is moderately suited to pasture and hay and to woodland. It is generally unsuited to cultivated crops, dwellings, and septic tank absorption fields because of the slope.

Erosion control is needed when grasses and legumes are becoming established in the pastured areas. In areas where the pasture is established, seeding legumes on the contour improves forage quality and helps to control erosion. A permanent cover of pasture plants helps to control erosion and maintains tilth. Selection of suitable species for planting, proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture and the soil in good condition.

If this soil is used as woodland, the erosion hazard, the equipment limitation, seedling mortality, and plant competition are management concerns. Logging roads and skid trails should be established on the contour if possible. On the steeper slopes, the logs or trees should be skidded uphill with a cable and winch. Firebreaks should be the grass type. Bare logging areas should be seeded to grass or to a grass-legume mixture. Machinery should be used only when the soil is firm enough to support the equipment. The seedling mortality rate can be reduced by eliminating all competing vegetation near the seedlings and by selecting the larger seedlings for planting. 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 VIe.

19E3—Sylvan silty clay loam, 15 to 30 percent slopes, severely eroded. This steep, well drained soil is on side slopes in the uplands. Individual areas are long and irregular in shape and range from 5 to 50 acres in size.

Typically, the surface layer is exposed subsoil material. It is dark yellowish brown, firm silty clay loam about 6 inches thick. The subsoil is yellowish brown, firm silty clay loam about 19 inches thick. The underlying material to a depth of 60 inches is light brownish gray, mottled, calcareous, friable silt loam. In some areas the soil is calcareous within a depth of 20 inches. In other areas it contains more sand.

Water and air move through the Sylvan soil at a moderate rate. Surface runoff is rapid. The available water capacity is very high. Organic matter content is low. Reaction is medium acid or slightly acid in the subsoil and medium acid in the surface layer. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are used for pasture. Some are used for cultivated crops. This soil is moderately suited to pasture and hay and well suited to woodland. It is generally unsuited to cultivated crops, dwellings, and septic tank absorption fields because of the slope.

Establishing pasture and hay crops helps to keep soil loss within tolerable limits. Seedbed preparation is difficult on severely eroded side slopes where the subsoil is exposed. A no-till method of pasture renovation or seeding helps to control further erosion. The plants should not be grazed until they are sufficiently established. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to prevent surface compaction and excessive runoff.

If this soil is used as woodland, the erosion hazard, the equipment limitation, seedling mortality, and plant competition are management concerns. Logging roads and skid trails should be established on the contour if possible. On the steeper slopes, the logs or trees should be skidded uphill with a cable and winch. Firebreaks should be the grass type. Bare logging areas should be seeded to grass or to a grass-legume mixture. Machinery should be used only when the soil is firm enough to support the equipment. The seedling mortality rate can be reduced by eliminating all competing vegetation near the seedlings and by selecting the larger seedlings for planting. 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 VIe.

26—Wagner silt loam. This nearly level, poorly drained soil is on low terraces. It is protected by levees but is still subject to rare flooding. Individual areas are irregular in shape and range from 5 to 200 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 9 inches thick. The subsurface layer is mixed dark grayish brown and grayish brown, mottled, friable silt loam about 7 inches thick. The subsoil is firm silty clay loam about 37 inches thick. It is mottled. The upper part is dark grayish brown, and the lower part is grayish brown. The underlying material to a depth of 60 inches is grayish brown, mottled, firm silty clay loam. In some areas the soil has a lower clay content and a higher sand content. In other areas the subsurface layer is darker.

Included with this soil in mapping are small areas of the moderately permeable Littleton and Tice soils in the slightly higher landscape positions. These soils make up 5 to 10 percent of the unit.

Water and air move through the Wagner soil at a very slow rate. Surface runoff is slow or ponded. A seasonal high water table is within a depth of 2 feet during the spring. The available water capacity is high. Organic matter content is moderate. Reaction is slightly acid or neutral in the subsoil and slightly acid in the surface layer. The shrink-swell potential is high, and the potential for frost action is moderate.

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

If drained, this soil can be used for corn, soybeans, and small grain. A drainage system has been installed in most areas. Measures that maintain or improve the drainage system are needed. Surface drains and surface inlet tile function satisfactorily if suitable outlets are available. Land grading helps to control ponding. Applying a conservation tillage system that leaves crop residue on the surface after planting and returning crop residue to the soil improve tilth, help to prevent surface compaction and crusting, and increase the rate of water intake.

The land capability classification is IIw.

30F—Hamburg silt loam, 20 to 35 percent slopes. This steep, somewhat excessively drained soil is on side slopes along drainageways and on bluffs. Individual areas are broad and irregular in shape and range from 10 to 125 acres in size.

Typically, the surface layer is dark brown, calcareous, friable silt loam about 6 inches thick. The subsurface layer is brown, calcareous, friable silt loam about 5 inches thick. The underlying material to a depth of 60 inches is yellowish brown, dark yellowish brown, and brown, calcareous, friable silt. In some areas the surface layer is darker. In other areas the soil has a silty clay loam subsoil.

Included with this soil in mapping are small areas of the sandy, droughty Bloomfield soils. These soils are in landscape positions similar to those of the Hamburg soil. They make up 8 to 10 percent of the unit.

Water and air move through the Hamburg soil at a moderate rate. Surface runoff is very rapid. The available water capacity is very high. Organic matter content is moderately low. Reaction is moderately alkaline throughout the profile. The potential for frost action is high.

Most areas are used for pasture. Some are wooded. This soil is moderately suited to pasture and hay and to woodland. It is generally unsuited to cultivated crops, dwellings, and septic tank absorption fields because of the slope.

Erosion control is needed when grasses and legumes are becoming established in the pastured areas. In areas where the pasture is established, seeding legumes on the contour improves forage quality and helps to control erosion. A permanent cover of pasture plants helps to control erosion and maintains tilth. Operating machinery is difficult on the steeper slopes. Selection of suitable species for planting, proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture and the soil in good condition.

If this soil is used as woodland, the erosion hazard, the equipment limitation, seedling mortality, and plant competition are management concerns. Logging roads and skid trails should be established on the contour if possible. On the steeper slopes, the logs or trees should be skidded uphill with a cable and winch. Firebreaks should be the grass type. Bare logging areas should be seeded to grass or to a grass-legume mixture. Machinery should be used only when the soil is firm enough to support the equipment. The seedling mortality rate can be reduced by eliminating all competing vegetation near the seedlings and by selecting the larger seedlings for planting. 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.

30G—Hamburg silt loam, 35 to 60 percent slopes. This very steep, somewhat excessively drained soil is on cone-shaped hills and the faces of bluffs. Individual areas are circular or irregularly shaped and range from 3 to 250 acres in size.

Typically, the surface layer is brown, calcareous, friable silt loam about 6 inches. The subsurface layer is dark yellowish brown, calcareous, friable silt loam about 9 inches thick. The underlying material to a depth of 60 inches is dark yellowish brown and yellowish brown, calcareous, friable silt. In some areas the surface soil is darker. In places the soil has a higher content of clay and sand throughout.

Included with this soil in mapping are small areas of the sandy, droughty Bloomfield soils on the less sloping ridges and side slopes. These soils make up 5 to 10 percent of the unit.

Water and air move through the Hamburg soil at a moderate rate. Surface runoff is very rapid. The available water capacity is very high. Organic matter content is moderately low. Reaction is moderately alkaline throughout the profile. The potential for frost action is high.

Most areas are wooded. A few are pastured or are idle. This soil is very poorly suited to woodland and moderately suited to woodland wildlife habitat. It is generally unsuited to cultivated crops, pasture, dwellings, and septic tank absorption fields because of the slope.

If this soil is used as woodland, the erosion hazard, the equipment limitation, seedling mortality, and plant competition are management concerns. Logging roads and skid trails should be established on the contour if possible. On the steeper slopes, the logs or trees should be skidded uphill with a cable and winch. Firebreaks should be the grass type. Bare logging areas should be seeded to grass or to a grass-legume mixture. Machinery should be used only when the soil is firm enough to support the equipment. The seedling mortality rate can be reduced by eliminating all competing vegetation near the seedlings and by selecting the larger seedlings for planting. 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.

This soil is suitable for grain and seed crops and wild herbaceous plants, all of which are needed in areas of woodland wildlife habitat. Food plots of grain or seed crops should be established only in the less steep areas. Also, the crops should be planted on the contour. Measures that protect the habitat from fire and grazing help to prevent depletion of the shrubs and sprouts that provide food for wildlife.

The land capability classification is VIIe.

36B—Tama silt loam, 2 to 5 percent slopes. This gently sloping, moderately well drained soil is on ridges and convex side slopes in the uplands. Individual areas are oval or irregularly shaped and range from 5 to 500 acres in size.

Typically, the surface layer is very dark brown, friable silt loam about 8 inches thick. The subsurface layer is very dark grayish brown, friable silt loam about 6 inches thick. The subsoil extends to a depth of 60 inches or more. The upper part is brown, friable silty clay loam; the next part is dark yellowish brown, mottled, firm silty clay loam; and the lower part is yellowish brown, mottled, friable silt loam. In some areas the depth to the seasonal high water table is less than 4 feet. Other areas are severely eroded.

Water and air move through the Tama soil at a moderate rate. Surface runoff is medium. A seasonal high water table is 4 to 6 feet below the surface during the spring. The available water capacity is very high. Organic matter content is moderate. Reaction is medium acid in the subsoil and slightly acid in the surface layer. 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 suited to dwellings and septic tank absorption fields.

In areas used for corn, soybeans, or small grain, erosion is a hazard. It can be controlled by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, or by terraces. Returning crop residue to the soil and adding other organic material improve tilth.

If this soil is used as a site for dwellings with basements, the seasonal high water table and the shrink-swell potential are limitations. The shrink-swell potential also is a limitation on sites for dwellings without basements. Installing subsurface tile drains near the foundations helps to overcome the wetness. Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

The seasonal high water table is a limitation if this soil is used as a site for septic tank absorption fields. Subsurface tile drains lower the water table.

The land capability classification is IIe.

36C2—Tama silt loam, 5 to 10 percent slopes, eroded. This moderately sloping, moderately well drained soil is on convex side slopes and knolls in the uplands. Individual areas are long and narrow or are broad and irregularly shaped. They range from 5 to 75 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 9 inches thick. The subsoil is about 37 inches thick. The upper part is brown, friable silty clay loam; the next part is dark yellowish brown, mottled, friable silty clay loam; and the lower part is yellowish brown, mottled, friable silty clay loam and silt loam. The underlying material to a depth of 60 inches is yellowish brown, friable silt loam. In some areas the lower part of the subsoil has a higher content of sand. In places the surface layer is severely eroded and has a higher content of clay.

Water and air move through the Tama soil at a moderate rate. Surface runoff is medium. A seasonal high water table is 4 to 6 feet below the surface during the spring. The available water capacity is very high. Organic matter content is moderate. Reaction is neutral in the subsoil and surface layer. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is moderately suited to cultivated crops, dwellings, and septic tank absorption fields.

If this soil is used for corn, soybeans, or small grain, erosion is a hazard and tilth is a problem. Soil loss can be kept within tolerable limits by a crop rotation that includes 1 or more years of forage crops, by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, by terraces, or by a combination of these. Returning crop residue to the soil and regularly adding other organic material help to maintain productivity, prevent crusting, and improve tilth.

If this soil is used as a site for dwellings with basements, the seasonal high water table and the shrink-swell potential are limitations. The shrink-swell potential and the slope also are limitations on sites for dwellings without basements. Installing subsurface tile drains near the foundations helps to overcome the wetness. Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling. The slope is a limitation where it is more than 8 percent. Cutting, filling, and land shaping help to overcome this limitation.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table is a limitation. Subsurface tile drains lower the water table. The slope is a limitation where it is more than 8 percent. Installing the filter lines on the contour or cutting and land shaping help to overcome this limitation.

The land capability classification is IIIe.

37A—Worthen silt loam, 0 to 2 percent slopes. This nearly level, well drained soil is on alluvial fans extending outward from bluffs. Individual areas are broad and irregular in shape and range from 5 to 300 acres in size.

Typically, the surface layer is very dark gray, friable silt loam about 9 inches thick. The subsurface layer is friable silt loam about 17 inches thick. It is very dark grayish brown in the upper part and dark brown in the lower part. The subsoil to a depth of 60 inches is friable silt loam. The upper part is brown, and the lower part is dark yellowish brown. In some areas the lower part of the subsoil has a higher content of sand. In other areas the lower part of the subsoil and the underlying material are calcareous.

Included with this soil in mapping are small areas of the somewhat poorly drained Littleton soils on the lower parts of the landscape. These soils make up about 5 percent of the unit.

Water and air move through the Worthen soil at a moderate rate. Surface runoff is slow. The available water capacity is very high. Organic matter content is moderate. Reaction is slightly acid in the subsoil and surface layer. 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 and to dwellings and septic tank absorption fields.

No major limitations affect the use of this soil for corn, soybeans, or small grain. A conservation tillage system that leaves crop residue on the surface after planting helps to maintain tilth and fertility.

The land capability classification is I.

37B—Worthen silt loam, 2 to 5 percent slopes. This gently sloping, well drained soil is on foot slopes and alluvial fans extending outward from bluffs. Individual areas are broad and irregular in shape and range from 5 to 500 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 9 inches thick. The subsurface layer is dark brown, friable silt loam about 20 inches thick. The subsoil to a depth of 60 inches is friable silt loam. The upper part is dark brown, and the lower part is brown and dark yellowish brown. In some areas the lower part of the subsoil has a higher content of sand. In other areas the soil has a thin, light colored surface layer of silty overwash.

Included with this soil in mapping are small areas of the somewhat poorly drained Littleton soils on the lower parts of the landscape. These soils make up about 5 percent of the unit.

Water and air move through the Worthen soil at a moderate rate. Surface runoff is medium. The available water capacity is very high. Organic matter content is moderate. Reaction is neutral in the subsoil and surface layer. 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 and to dwellings and septic tank absorption fields.

In areas used for corn, soybeans, or small grain, erosion is a hazard. It can be controlled by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, or by terraces. Returning crop residue to the soil and adding other organic material improve tilth.

The land capability classification is IIe.

37C—Worthen silt loam, 5 to 12 percent slopes. This moderately sloping, well drained soil is on concave foot slopes. Individual areas are irregular in shape and range from 20 to 100 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 7 inches thick. The subsurface layer is friable silt loam about 18 inches thick. The upper part is very dark grayish brown, and the lower part is dark brown. The subsoil to a depth of 60 inches is dark yellowish brown, friable silt loam. In some areas, the surface layer is lighter in color and the subsoil is calcareous. In other areas the surface layer has a higher content of sand.

Included with this soil in mapping are small areas of exposed limestone bedrock along the base of the adjacent bluffs. These areas make up 10 to 15 percent of the unit.

Water and air move through the Worthen soil at a moderate rate. Surface runoff is medium. The available water capacity is very high. Organic matter content is moderate. Reaction is mildly alkaline in the subsoil and neutral in the surface layer. The shrink-swell potential is low, and the potential for frost action is high.

Most areas are cultivated. Some are used for pasture. This soil is well suited to pasture and hay. It is moderately suited to cultivated crops, dwellings, and septic tank absorption fields.

If this soil is used for corn, soybeans, or small grain, erosion is a hazard and tilth is a problem. Soil loss can be kept within tolerable limits by a crop rotation that includes 1 or more years of forage crops, by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, by terraces, or by a combination of these. Returning crop residue to the soil and regularly adding other organic material help to maintain productivity, prevent crusting, and improve tilth.

Adapted forage and hay plants grow well on this soil. Timely deferment of grazing helps to prevent overgrazing and thus also helps to prevent surface compaction, excessive runoff, and a greater susceptibility to erosion. Tilling on the contour when a seedbed is prepared or the pasture is renovated helps to control erosion. Applications of fertilizer are needed. The plants should not be grazed or clipped until they are sufficiently established.

If this soil is used as a site for dwellings or septic tank absorption fields, the slope is a limitation. Cutting, filling, and land shaping help to overcome this limitation on sites for dwellings. Installing the filter lines on the contour helps to overcome this limitation on sites for septic tank absorption fields.

The land capability classification is IIIe.

43A—Ipava silt loam, 0 to 2 percent slopes. This nearly level, somewhat poorly drained soil is on broad upland ridges. Individual areas are irregular in shape and range from 3 to 1,000 acres in size.

Typically, the surface layer is black, friable silt loam about 9 inches thick. The subsurface layer is black, friable silty clay loam about 9 inches thick. The subsoil is mottled, firm silty clay loam about 36 inches thick. The upper part is dark grayish brown, and the lower part is brown. The underlying material to a depth of 60 inches is light brownish gray, mottled, friable silt loam. In some areas the subsoil has a lower content of clay. In other areas the depth to the seasonal high water table is more than 3 feet.

Included with this soil in mapping are small areas of the poorly drained Denny, Sable, and Virden soils, which are subject to ponding. Denny soils are in small depressions surrounded by the Ipava soil. Sable and Virden soils are in drainageways and other low areas. Included soils make up 8 to 12 percent of the unit.

Water and air move through the Ipava soil at a moderately slow rate. Surface runoff is slow. A seasonal high water table is 1 to 3 feet below the surface during the spring. The available water capacity is high. Organic matter content also is high. Reaction is medium acid to mildly alkaline in the subsoil. It is neutral in the surface layer as a result of local liming practices. The shrink-swell potential and the potential for frost action are high.

Most areas are cultivated. This soil is well suited to cultivated crops. It is poorly suited to dwellings and septic tank absorption fields.

No major limitations affect the use of this soil for corn, soybeans, or small grain. The seasonal high water table can delay planting in some years. Subsurface tile drains function satisfactorily if suitable outlets are available. A conservation tillage system that leaves crop residue on the surface after planting helps 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 subsurface tile drains near the foundations helps overcome the wetness. Extending the footings below the subsoil or 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. Subsurface tile drains lower the water table. Grading and land shaping help to remove surface water. Increasing the size of the filter field or replacing the soil with more permeable material helps to overcome the moderately slow permeability.

The land capability classification is I.

43B—Ipava silt loam, 2 to 5 percent slopes. This gently sloping, somewhat poorly drained soil is on upland ridges and convex side slopes along drainageways. Individual areas are irregular in shape and range from 5 to 100 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 14 inches thick. The subsoil is mottled, firm silty clay loam about 36 inches thick. The upper part is brown, and the lower part is yellowish brown. The underlying material to a depth of 60 inches is light brownish gray, mottled, friable silt loam. In some areas, the subsoil has less clay and the depth to the seasonal high water table is more than 3 feet.

Included with this soil in mapping are small areas of the poorly drained Denny, Sable, and Virden soils, which are subject to ponding. Denny soils are in depressions surrounded by the Ipava soil. Sable and Virden soils are in shallow drainageways. Included soils make up 5 to 10 percent of the unit.

Water and air move through the Ipava soil at a moderately slow rate. Surface runoff is medium. A seasonal high water table is 1 to 3 feet below the surface during the spring. The available water capacity is high. Organic matter content also is high. Reaction is medium acid to neutral in the subsoil. It is neutral in the surface layer as a result of local liming practices. The shrink-swell potential and the potential for frost action are high.

Most areas are cultivated. This soil is well suited to cultivated crops. It is poorly suited to dwellings and septic tank absorption fields.

In the areas used for corn, soybeans, or small grain, erosion is a hazard. Also, the wetness can delay planting in some years. It can be reduced by surface ditches. Erosion can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, by contour farming, or by terraces. Returning crop residue to the soil and regularly adding other organic material 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 subsurface tile drains near the foundations helps overcome the wetness. Extending the footings below the subsoil or 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. Subsurface tile drains lower the water table. Increasing the size of the filter field or replacing the soil with more permeable material helps to overcome the moderately slow permeability.

The land capability classification is IIe.

45—Denny silt loam. This nearly level, poorly drained soil is in small depressions on uplands. It is subject to ponding. Individual areas are circular and range from 3 to 10 acres in size.

Typically, the surface layer is very dark gray, friable silt loam about 9 inches thick. The subsurface layer is grayish brown, friable silt loam about 8 inches thick. The subsoil to a depth of 60 inches is silty clay loam. It is mottled. The upper part is grayish brown and firm, and the lower part is light brownish gray and friable. In some areas the dark surface layer is more than 9 inches thick.

Included with this soil in mapping are small areas of the somewhat poorly drained Ipava soils on the rims of the depressions. These soils are not subject to ponding. They make up less than 5 percent of the unit.

Water and air move through the Denny soil at a slow rate. Surface runoff is ponded. A seasonal high water table is 0.5 foot above the surface to 2.0 feet below during the spring. The available water capacity is high. Organic matter content is moderate. Reaction is medium acid or slightly acid in the subsoil and medium acid in the surface layer. The shrink-swell potential and the potential for frost action are high.

Most areas are cultivated. This soil is well suited to cultivated crops. It is generally unsuited to dwellings and septic tank absorption fields because of the ponding and the slow permeability.

If drained, this soil can be used for corn, soybeans, and small grain. A drainage system has been installed in most areas. Measures that maintain or improve the drainage system are needed. Surface drains and surface inlet tile function satisfactorily if suitable outlets are available. Land grading helps to control ponding. Applying a conservation tillage system that leaves crop residue on the surface after planting and returning crop residue to the soil improve tilth, help to prevent surface compaction and crusting, and increase the rate of water intake.

The land capability classification is IIw.

49—Watseka loamy sand. This nearly level, somewhat poorly drained soil is along the base of terraces. Individual areas are long and narrow and range from 10 to 50 acres in size.

Typically, the surface layer is very dark grayish brown, very friable loamy sand about 11 inches thick. The subsoil is dark brown and brown, mottled, very friable loamy sand about 16 inches thick. The underlying material to a depth of 60 inches is brown and light brown, mottled, loose sand. In some areas the subsoil has a higher content of clay.

Included with this soil in mapping are small areas of the poorly drained Ambraw and Orio soils. These soils are less permeable than the Watseka soil and are lower on the landscape. They make up 10 to 15 percent of the unit.

Water and air move through the Watseka soil at a rapid rate. Surface runoff is slow. A seasonal high water table is 1 to 3 feet below the surface during the winter and spring. The available water capacity is low. Organic matter content is moderate. Reaction is medium acid in the subsoil and surface layer. The shrink-swell potential is low, and the potential for frost action is moderate.

Most areas are cultivated. This soil is moderately suited to cultivated crops. It is poorly suited to dwellings and septic tank absorption fields.

In areas used for corn, soybeans, or small grain, soil blowing is a hazard and the low available water capacity is a limitation. A system of conservation tillage that leaves crop residue on the surface after planting helps to maintain productivity, conserves moisture, and helps to control soil blowing.

If this soil is used as a site for dwellings, the seasonal high water table is a limitation. Installing subsurface tile drains near the foundation helps to overcome this limitation.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table and a poor filtering capacity in the underlying material are limitations. The soil readily absorbs but does not adequately filter the effluent from septic tanks. The poor filtering capacity can result in pollution of ground water. Underground drains help to lower the water table. Mounding with suitable fill material improves the filtering capacity of the field and increases the depth to the seasonal high water table.

The land capability classification is IIIs.

50—Virden silty clay loam. This nearly level, poorly drained soil is on broad, low upland flats. It is subject to ponding. Individual areas are irregular in shape and range from 3 to 500 acres in size.

Typically, the surface layer is black, friable silty clay loam about 8 inches thick. The subsurface layer is black, firm silty clay loam about 10 inches thick. The subsoil is mottled, firm silty clay loam about 36 inches thick. The upper part is black, the next part is dark grayish brown, and the lower part is light brownish gray. The underlying material to a depth of 60 inches is light olive, mottled, friable silt loam. In some areas the surface soil is more than 24 inches thick. In other areas the subsoil has a lower content of clay.

Included with this soil in mapping are small areas of the somewhat poorly drained Ipava and moderately well drained Tama soils. These soils are in the more sloping areas above the Virden soil and are not subject to ponding. They make up 10 to 15 percent of the unit.

Water and air move through the Virden soil at a moderately slow rate. Surface runoff is slow or ponded. A seasonal high water table is 0.5 foot above the surface to 2.0 feet below during the spring. The available water capacity is high. Organic matter content also is high. Reaction is neutral in the subsoil and surface layer. The shrink-swell potential and the potential for frost action are high. The surface layer becomes compact and cloddy if plowed when too wet.

Most areas are cultivated. This soil is well suited to cultivated crops. It is poorly suited to dwellings and septic tank absorption fields.

If drained, this soil can be used for corn, soybeans, and small grain. A drainage system has been installed in most areas. Measures that maintain or improve the drainage system are needed. Surface drains, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. Land grading helps to control ponding. Applying a conservation tillage system that leaves crop residue on the surface after planting and returning crop residue to the soil improve tilth, help to prevent surface compaction, and increase the rate of water intake.

The seasonal wetness and the shrink-swell potential are limitations if this soil is used as a site for dwellings. Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings helps to lower the water table. Elevating the floor of dwellings without basements above the surrounding ground level, grading, and diverting surface water also help to overcome the wetness.

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. Subsurface tile drains lower the water table. Grading and land shaping help to remove surface water. Increasing the size of the filter field or replacing the soil with more permeable material helps to overcome the moderately slow permeability.

The land capability classification is IIw.

53B—Bloomfield loamy sand, 2 to 7 percent slopes. This gently sloping, somewhat excessively drained soil is on dunelike ridges in the uplands and on the sides of terraces (fig. 8). Individual areas are irregular in shape and range from 5 to 40 acres in size.

Typically, the surface layer is dark brown, loose loamy sand about 9 inches thick. The subsurface layer is dark yellowish brown, loose loamy sand about 11 inches thick. The subsoil to a depth of 60 inches is yellowish brown, loose fine sand that has bands of brown, very friable loamy sand. In some areas, it does not have bands of loamy sand or the total thickness of the bands is less than 6 inches. In other areas the subsoil has a higher content of clay.

Water and air move through the Bloomfield soil at a rapid rate. Surface runoff is slow. The available water capacity is low. Organic matter content also is low. Reaction is slightly acid or neutral in the subsoil and medium acid in the surface layer.

Most areas are used for pasture. Some are used for cultivated crops. This soil is moderately suited to pasture and to cultivated crops. It is well suited to dwellings but is poorly suited to septic tank absorption fields.

If this soil is used for corn, soybeans, or small grain, droughtiness and low fertility are limitations. Also, soil blowing is a hazard. Irrigation can supply the moisture needed for crops. Frequent applications of a small amount of fertilizer are needed. One application of a

Figure 8.—An area of Bloomfield loamy sand, 2 to 7 percent slopes, on dunelike ridges.

large amount can result in excessive loss of plant nutrients through leaching. Applying a system of conservation tillage that leaves crop residue on the surface after planting, returning crop residue to the soil, and regularly adding other organic material help to maintain productivity, conserve moisture, and help to control soil blowing.

In areas used for pasture, droughtiness and low fertility are limitations and soil blowing is a hazard. Selection of drought-tolerant grasses and legumes for planting helps to maintain or improve forage stands. Fertilizer should be applied frequently and in small amounts. This method of application helps to prevent excessive loss of plant nutrients through leaching. Proper stocking rates, pasture rotation, and timely deferment of grazing help to keep the pasture in good condition and help to control soil blowing.

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 from septic tanks. The poor filtering capacity can result in the pollution of ground water. Filling or mounding with suitable material increases the filtering capacity of the field.

The land capability classification is IIIs.

53D—Bloomfield loamy sand, 7 to 18 percent slopes. This strongly sloping, somewhat excessively drained soil is on the sides of dunelike ridges in the uplands and on terrace side slopes. Individual areas are irregular in shape and range from 5 to 125 acres in size.

Typically, the surface layer is dark yellowish brown, very friable loamy sand about 7 inches thick. The subsurface layer is dark yellowish brown, loose loamy sand about 24 inches thick. The subsoil to a depth of 60 inches is yellowish brown, loose fine sand that has bands of brown, very friable loamy sand. In some areas, the subsoil has no bands of loamy sand or the total thickness of the bands is less than 6 inches. In other areas the subsoil has a higher content of clay.

Water and air move through the Bloomfield soil at a rapid rate. Surface runoff is slow. The available water capacity is low. Organic matter content also is low. Reaction is slightly acid or neutral in the subsoil and neutral in the surface layer.

Most areas are used for pasture. Some are used for cultivated crops. This soil is moderately suited to pasture, hay, woodland, and dwellings. It is poorly suited to cultivated crops and septic tank absorption fields.

In areas used for pasture, droughtiness and low fertility are limitations and soil blowing is a hazard. Selection of drought-tolerant grasses and legumes for planting helps to maintain or improve forage stands. Fertilizer should be applied frequently and in small amounts. This method of application helps to prevent excessive loss of plant nutrients through leaching. Proper stocking rates, pasture rotation, and timely deferment of grazing help to keep the pasture in good condition and help to control soil blowing.

If this soil is used as woodland, seedling mortality is a management concern. It is caused by the low available water capacity. The seedling mortality rate can be reduced by planting nursery stock that is larger than is typical, by planting in furrows, or by mulching. Competing 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. Measures that protect the woodland from fire are needed.

If this soil is used as a site for dwellings, the slope is a limitation. Cutting, filling, and land shaping help to overcome this limitation.

If this soil is used as a site for septic tank absorption fields, the slope and a poor filtering capacity are limitations. The soil readily absorbs but does not adequately filter the effluent from septic tanks. The poor filtering capacity can result in the pollution of ground water. The site should be leveled. Filling or mounding with suitable material increases the filtering capacity of the field.

The land capability classification is IVe.

53E—Bloomfield loamy sand, 18 to 35 percent slopes. This steep, somewhat excessively drained soil is on side slopes in the uplands. Individual areas are irregular in shape and range from 5 to 125 acres in size.

Typically, the surface layer is very dark grayish brown, loose loamy sand about 2 inches thick. The subsurface layer is brown and dark yellowish brown, loose loamy sand about 24 inches thick. The subsoil to a depth of 60 inches is yellowish brown, loose loamy sand that has bands of brown, very friable loamy sand. In some areas, the subsoil has no bands of loamy sand or the total thickness of the bands is less than 6 inches. In other areas the soil has a lower content of sand.

Water and air move through this soil at a rapid rate. Surface runoff is medium. The available water capacity is low. Organic matter content also is low. Reaction is medium acid in the subsoil and strongly acid or medium acid in the surface soil.

Most areas are wooded. Some are used for pasture. This soil is moderately suited to woodland, pasture, and hay. It is generally unsuited to cultivated crops because of the slope and droughtiness and to dwellings and septic tank absorption fields because of the slope.

If this soil is used as woodland, the erosion hazard, the equipment limitation, seedling mortality, and plant competition are management concerns. Logging roads and skid trails should be established on the contour if possible. On the steeper slopes, the logs or trees should be skidded uphill with a cable and winch. Firebreaks should be the grass type. Bare logging areas should be seeded to grass or to a grass-legume mixture. Machinery should be used only when the soil is firm enough to support the equipment. The seedling mortality rate can be reduced by planting species that can withstand droughty conditions, by eliminating all competing vegetation near the seedlings, and by selecting the larger seedlings for planting. 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 VIe.

54B—Plainfield loamy sand, 2 to 7 percent slopes. This gently sloping, excessively drained soil is on broad terraces. Individual areas are irregular in shape and range from 5 to 500 acres in size.

Typically, the surface layer is mixed dark brown and dark yellowish brown, loose loamy sand about 9 inches thick. The subsoil is dark yellowish brown, loose sand about 8 inches thick. The underlying material to a depth of 60 inches is yellowish brown, loose sand. In some areas the subsoil has numerous thin bands of loamy sand. In other areas the surface soil is darker and thicker.

Included with this soil in mapping are small areas of the poorly drained Orio soils in depressions. These soils make up less than 5 percent of the unit.

Water and air move through the Plainfield soil at a rapid rate. Surface runoff is slow. The available water capacity is low. Organic matter content also is low. Reaction is strongly acid throughout the profile.

Most areas are cultivated. Some are used for pasture or are idle. This soil is poorly suited to cultivated crops and moderately suited to pasture and hay. It is well suited to dwellings but is poorly suited to septic tank absorption fields. It is a good source of sand.

If this soil is used for corn, soybeans, or small grain, droughtiness and low fertility are limitations. Also, soil blowing is a hazard. Irrigation can supply the moisture needed for crops. Frequent applications of a small amount of fertilizer are needed. One application of a large amount can result in excessive loss of plant nutrients through leaching. Applying a system of conservation tillage that leaves crop residue on the surface after planting, returning crop residue to the soil, and regularly adding other organic material help to maintain productivity, conserve moisture, and help to control soil blowing.

In areas used for pasture, droughtiness and low fertility are limitations and soil blowing is a hazard. Selection of drought-tolerant grasses and legumes for planting helps to maintain or improve forage stands. Fertilizer should be applied frequently and in small amounts. This method of application helps to prevent excessive loss of plant nutrients through leaching. Proper stocking rates, pasture rotation, and timely deferment of grazing help to keep the pasture in good condition and help to control soil blowing.

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 from septic tanks. The poor filtering capacity can result in the pollution of ground water. Filling or mounding with suitable material increases the filtering capacity of the field.

The land capability classification is IVs.

54D—Plainfield loamy sand, 7 to 15 percent slopes. This strongly sloping, excessively drained soil is on side slopes on terraces and uplands. Individual areas are long and narrow or irregularly shaped and range from 3 to 100 acres in size.

Typically, the surface layer is brown, very friable loamy sand about 7 inches thick. The subsoil is sand about 21 inches thick. The upper part is dark yellowish brown and very friable, and the lower part is brown and loose. The underlying material to a depth of 60 inches is yellowish brown, loose sand. In some areas the subsoil has numerous thin bands of loamy sand.

Included with this soil in mapping are small areas of the poorly drained Orio and somewhat poorly drained Watseka soils along the base of terrace ridges. These soils make up 10 to 15 percent of the unit.

Water and air move through the Plainfield soil at a rapid rate. Surface runoff is slow. The available water capacity is low. Organic matter content also is low. Reaction is strongly acid or medium acid in the subsoil and strongly acid in the surface layer.

Most areas are pastured or are idle. A few are used for cultivated crops. This soil is moderately suited to pasture and hay and to woodland. It is generally unsuited to cultivated crops because of the slope and droughtiness. It is moderately suited to dwellings but is poorly suited to septic tank absorption fields. It is a good source of sand.

If this soil is used as woodland, seedling mortality is a management concern. It is caused by the low available water capacity. The seedling mortality rate can be reduced by planting nursery stock that is larger than is typical, by planting in furrows, or by mulching. Competing 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. Measures that protect the woodland from fire are needed.

If this soil is used as a site for dwellings, the slope is a limitation. Cutting, filling, and land shaping help to overcome this limitation.

If this soil is used as a site for septic tank absorption fields, the slope and a poor filtering capacity are limitations. The soil readily absorbs but does not adequately filter the effluent from septic tanks. The poor filtering capacity can result in the pollution of ground water. The site should be leveled. Filling or mounding with suitable material increases the filtering capacity of the field.

The land capability classification is VIs.

68—Sable silty clay loam. This nearly level, poorly drained soil is on broad, low upland flats and in shallow depressions and drainageways. It is subject to ponding. Individual areas are irregular in shape and range from 3 to 1,000 acres in size.

Typically, the surface layer is black, friable silty clay loam about 9 inches thick. The subsurface layer is black, mottled, firm silty clay loam about 8 inches thick. The subsoil is about 25 inches thick. It is mottled. The upper part is dark grayish brown, firm silty clay loam. The next part is grayish brown, friable silty clay loam. The lower part is light brownish gray, friable silt loam. The underlying material to a depth of 60 inches is light brownish gray, mottled, friable silt loam. In some areas the dark surface soil is more than 24 inches thick. In other areas the subsoil has more clay. In places the soil is calcareous within a depth of 40 inches.

Included with this soil in mapping are small areas of the somewhat poorly drained Ipava and moderately well drained Tama soils. These soils are in the more sloping areas above the Sable soil and are not subject to ponding. They make up 10 to 15 percent of the unit.

Water and air move through the Sable soil at a moderate rate. Surface runoff is slow or ponded. A seasonal high water table is 0.5 foot above the surface to 2.0 feet below during the spring. The available water capacity is very high. Organic matter content is high. Reaction is neutral or mildly alkaline in the subsoil and neutral in the surface layer. The shrink-swell potential is moderate, and the potential for frost action is high. The surface layer becomes compact and cloddy if tilled when too wet.

Most areas are cultivated. This soil is well suited to cultivated crops. It is poorly suited to dwellings and septic tank absorption fields.

If drained, this soil can be used for corn, soybeans, and small grain. A drainage system has been installed in most areas. Measures that maintain or improve the drainage system are needed. Surface drains, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. Land grading helps to control ponding. Applying a conservation tillage system that leaves crop residue on the surface after planting and returning crop residue to the soil improve tilth, help to prevent surface compaction, and increase the rate of water intake.

If this soil is used as a site for dwellings, the ponding is a hazard and the shrink-swell potential is a limitation. The hazard of ponding can be reduced by diverting surface water or constructing the building on raised fill material. Subsurface tile drains and surface inlet tile drains help to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

The seasonal high water table and the moderate permeability are limitations if this soil is used as a site for septic tank absorption fields. Subsurface tile drains lower the water table. Grading and land shaping help to remove excess surface water. Increasing the size of the filter field or replacing the soil with more permeable material helps to overcome the moderate permeability.

The land capability classification is IIw.

71—Darwin silty clay. This nearly level, very poorly drained soil is on broad bottom land. It is subject to ponding. It is protected by levees but is still subject to rare flooding. Individual areas are irregular in shape and range 10 to 1,000 acres in size.

Typically, the surface layer is very dark gray, firm silty clay about 13 inches thick. The subsoil extends to a depth of 60 inches. It is mottled and firm. The upper part is dark gray silty clay, the next part is dark grayish brown silty clay, and the lower part is gray silty clay loam. In some areas the surface layer and subsoil have a lower content of clay. In other areas the dark surface soil is more than 24 inches thick. In some places the lower part of the subsoil is sandy. In other places the soil is ponded for longer periods because of river seepage water.

Included with this soil in mapping are small areas of the moderately permeable Beaucoup and Dupo soils in the slightly higher landscape positions. Also included are areas of dredged material along drainage ditches. Included areas make up 5 to 10 percent of the unit.

Water and air move through the Darwin soil at a very slow rate. Surface runoff is slow or ponded. A seasonal high water table is 1 foot above the surface to 2 feet below during the spring. The available water is moderate. Organic matter content is high. Reaction is slightly acid or neutral in the subsoil and slightly acid in the surface layer. The shrink-swell potential is very high. The potential for frost action is moderate. The surface layer becomes very compact and cloddy if tilled when too wet.

Most areas are cultivated. This soil is moderately suited to cultivated crops. It is generally unsuited to dwellings and septic tank absorption fields because of the flooding and the ponding.

If drained, this soil can be used for corn, soybeans, and small grain. A drainage system has been installed in most areas. Measures that maintain or improve the drainage system are needed. A combination of surface ditches (fig. 9) and land leveling reduces the wetness. Tilling when the soil is wet causes surface compaction and decreases the rate of water infiltration. Returning crop residue to the soil, adding other organic material, and minimizing tillage increase the rate of water infiltration and help to maintain good tilth.

The land capability classification is IIIw.

Figure 9.—A drainage ditch in an area of Darwin silty clay.

73A—Ross loam, 0 to 3 percent slopes. This nearly level, well drained soil is on terraces. It is frequently flooded for brief periods in the winter and spring. Individual areas are irregular in shape and range from 10 to 60 acres in size.

Typically, the surface layer is very dark grayish brown, friable loam about 7 inches thick. The subsurface layer is very dark grayish brown and dark brown, friable loam about 9 inches thick. The subsoil is friable loam about 31 inches thick. The upper part is brown, and the lower part is dark yellowish brown and mottled. The underlying material to a depth of 60 inches is dark yellowish brown, mottled, loose loamy sand. In some areas the seasonal high water table is within a depth of 4 feet. In other areas the subsoil contains more clay.

Included with this soil in mapping are small areas of sandy, droughty soils on ridges of terraces. Also included are small areas of the poorly drained, frequently flooded Beaucoup soils on the lower parts of the landscape. Included soils make up 5 to 10 percent of the unit.

Water and air move through the Ross soil at a moderate rate. Surface runoff is slow. A seasonal high water table is 4 to 6 feet below the surface during late winter and early spring. The available water capacity is high. Organic matter content also is high. Reaction is neutral in the subsoil and surface layer. The potential for frost action is high.

Most areas are used for cultivated crops. Some are managed as wildlife habitat. This soil is well suited to cultivated crops, woodland, and habitat for woodland and openland wildlife. It is generally unsuited to dwellings and septic tank absorption fields because of the flooding.

In the areas used as cropland, the flooding is a hazard, but it occurs less often than once in 2 years during the growing season. Erosion or scouring during floods is a hazard if the soil is cultivated. As a result, the soil should not be cultivated in the fall and strips of grass are needed in critical areas. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Minimizing tillage and returning crop residue to the soil help to maintain good tilth and increase the rate of water infiltration.

If this soil is used as woodland, plant competition is a management concern. It affects the seedlings of desirable species. The competition in openings where timber has been harvested 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. Measures that protect the woodland from fire are needed.

This soil provides good habitat for woodland and openland wildlife. Most areas are adjacent to the bottom land along the Illinois River, which provides water for wildlife. Also available are grain and seed crops, wild herbaceous plants, and other important habitat elements.

The land capability classification is IIw.

78A—Arenzville silt loam, 0 to 3 percent slopes. This nearly level, moderately well drained soil is on bottom land. It is frequently flooded for brief periods in spring. Individual areas are irregular in shape and range from 3 to 100 acres in size.

Typically, the surface soil is brown, friable silt loam about 10 inches thick. The underlying material is about 16 inches of brown, friable silt loam that has thin strata of dark grayish brown and very dark grayish brown material. Below this to a depth of 60 inches is a buried soil of very dark grayish brown and very dark gray, mottled, friable silt loam. In some areas the soil does not have a buried soil and is calcareous throughout. In other areas it has a seasonal high water table within a depth of 3 feet. In places the surface layer is darker.

Water and air move through this soil at a moderate rate. Surface runoff is slow. A seasonal high water table is 3 to 6 feet below the surface during the winter and spring. The available water capacity is very high. Organic matter content is moderately low. Reaction is medium acid or slightly acid in the underlying material and in the buried soil. It is mildly alkaline in the surface layer as a result of local liming practices. The potential for frost action is high. The surface layer tends to crust after hard rains.

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

In the areas used as cropland, the flooding is a hazard, but it occurs less often than once in 2 years during the growing season. Erosion or scouring during floods is a hazard if the soil is cultivated. As a result, the soil should not be cultivated in the fall and strips of grass are needed in critical areas. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Minimizing tillage and returning crop residue to the soil help to maintain good tilth and increase the rate of water infiltration.

The land capability classification is IIw.

81—Littleton silt loam. This nearly level, somewhat poorly drained soil is on alluvial fans. It is protected by levees but is still subject to rare flooding. Individual areas are irregular in shape and range from 10 to 250 acres in size.

Typically, the surface layer is black, friable silt loam about 9 inches thick. The subsurface layer is friable silt loam about 18 inches thick. The upper part is black, and the lower part is very dark grayish brown. The subsoil is mottled, friable silt loam about 23 inches thick. The upper part is dark brown, and the lower part is dark grayish brown. The underlying material to a depth of 60 inches is light olive brown, mottled, friable silt loam. In some areas the surface layer is light colored, silty overwash. In other areas the dark surface soil is less than 24 inches thick. In a few places the subsoil has more clay. In other places the depth to the seasonal high water table is more than 3 feet.

Included with this soil in mapping are small areas of the very slowly permeable Wagner soils in slight depressions or the lower landscape positions. These soils make up about 5 percent of the unit.

Water and air move through the Littleton 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. The available water capacity is very high. Organic matter content is moderate. Reaction is neutral in the subsoil and surface layer. The potential for frost action is high.

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

No major limitations affect the use of this soil for corn, soybeans, or small grain. The seasonal high water table can delay planting in some years. Subsurface tile drains function satisfactorily if suitable outlets are available. A conservation tillage system that leaves crop residue on the surface after planting helps to maintain tilth and fertility.

The land capability classification is I.

87—Dickinson sandy loam. This nearly level, somewhat excessively drained soil is on low terraces. Individual areas are irregular in shape and range from 5 to 100 acres in size.

Typically, the surface layer is very dark grayish brown, very friable sandy loam about 8 inches thick. The subsurface layer also is very dark grayish brown, very friable sandy loam. It is about 11 inches thick. The subsoil is friable sandy loam about 28 inches thick. The upper part is brown, and the lower part is dark yellowish brown. The underlying material to a depth of 60 inches is dark yellowish brown, loose loamy sand. In some areas the subsoil has a higher content of clay.

Included with this soil in mapping are small areas of the somewhat poorly drained Hoopeston soils on the slightly lower parts of the landscape. These soils make up 10 to 15 percent of the unit.

Water and air move through the upper part of the Dickinson soil at a moderately rapid rate and through the lower part at a rapid rate. Surface runoff is slow. The available water capacity is moderate. Organic matter content is moderately low. Reaction is medium acid in the subsoil. It is neutral in the surface layer as a result of local liming practices. The potential for frost action is moderate.

Most areas are cultivated. This soil is moderately suited to cultivated crops. It is well suited to dwellings but is poorly suited to septic tank absorption fields.

If this soil is used for corn, soybeans, or small grain, droughtiness and low fertility are limitations. Also, soil blowing is a hazard. Irrigation can supply the moisture needed for crops. Frequent applications of a small amount of fertilizer are needed. One application of a large amount can result in excessive loss of plant nutrients through leaching. Applying a system of conservation tillage that leaves crop residue on the surface after planting, returning crop residue to the soil, and regularly adding other organic material help to maintain productivity, conserve moisture, and help to control soil blowing.

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 from septic tanks. The poor filtering capacity can result in the pollution of ground water. Filling or mounding with suitable material increases the filtering capacity of the field.

The land capability classification is IIs.

88B—Sparta loamy sand, 1 to 6 percent slopes. This gently sloping, excessively drained soil is on dunelike terrace ridges. Individual areas are irregular in shape and range from 3 to 250 acres in size.

Typically, the surface layer is very dark grayish brown, loose loamy sand about 8 inches thick. The subsurface layer is dark brown, loose loamy sand about 10 inches thick. The subsoil is loose loamy sand about 19 inches thick. The upper part is brown, and the lower part is dark yellowish brown. The underlying material to a depth of 60 inches is dark yellowish brown, loose sand. In some areas the dark surface soil is more than 24 inches thick. In other areas the soil has a lower content of sand.

Included with this soil in mapping are small areas of the somewhat poorly drained Hoopeston and well drained Onarga soils. Hoopeston soils are lower on the landscape than the Sparta soil. Onarga soils have a higher content of clay than the Sparta soil. They are on the crest of ridges. Included soils make up 10 to 15 percent of the unit.

Water and air move through the Sparta soil at a rapid rate. Surface runoff is slow. The available water capacity is low. Organic matter content is moderately low. Reaction is medium acid in the subsoil and strongly acid in the surface layer.

Most areas are cultivated. some are used for pasture or are idle. This soil is poorly suited to cultivated crops and moderately suited to pasture and hay. It is well suited to dwellings but is poorly suited to septic tank absorption fields.

If this soil is used for corn, soybeans, or small grain, droughtiness and low fertility are limitations. Also, soil blowing is a hazard. Irrigation can supply the moisture needed for crops. Frequent applications of a small amount of fertilizer are needed. One application of a large amount can result in excessive loss of plant nutrients through leaching. Applying a system of conservation tillage that leaves crop residue on the surface after planting, returning crop residue to the soil, and regularly adding other organic material help to maintain productivity, conserve moisture, and help to control soil blowing.

In areas used for pasture, droughtiness and low fertility are limitations and soil blowing is a hazard. Selection of drought-tolerant grasses and legumes for planting helps to maintain or improve forage stands. Fertilizer should be applied frequently and in small amounts. This method of application helps to prevent excessive loss of plant nutrients through leaching. Proper stocking rates, pasture rotation, and timely deferment of grazing help to keep the pasture in good condition and help to control soil blowing.

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 from septic tanks. The poor filtering capacity can result in the pollution of ground water. Filling or mounding with suitable material increases the filtering capacity of the field.

The land capability classification is IVs.

107—Sawmill silty clay loam. This nearly level, poorly drained soil is on bottom land. It is frequently flooded for brief periods in spring. Individual areas are long and narrow or irregularly shaped and range from 5 to 100 acres in size.

Typically, the surface layer is very dark grayish brown, firm silty clay loam about 5 inches thick. The subsurface layer is mottled, firm silty clay loam about 21 inches thick. The upper part is very dark grayish brown, and the lower part is very dark gray. The subsoil is mottled, firm silty clay loam about 22 inches thick. The upper part is very dark gray, the next part is dark grayish brown, and the lower part is grayish brown. The underlying material to a depth of 60 inches is grayish brown, mottled, firm silty clay loam. In some areas the dark surface soil is more than 36 inches thick. In other areas the subsoil has a higher content of clay.

Included with this soil in mapping are small areas where the soil is undrained and is subject to ponding. These areas make up less than 5 percent of the unit.

Water and air move through the Sawmill soil at a moderate rate. Surface runoff is slow. A seasonal high water table is within a depth of 2 feet during the spring. The available water capacity is high. Organic matter content also is high. Reaction is slightly acid or neutral in the subsoil and neutral in the surface layer. The shrink-swell potential is moderate, and the potential for frost action is high. The surface layer becomes compact and cloddy if tilled when too wet.

Most areas are cultivated. Some are wooded. This soil is well suited to cultivated crops and to woodland. It is generally unsuited to dwellings and septic tank absorption fields because of the flooding.

If this soil is used for corn, soybeans, or small grain, the flooding is a hazard and the wetness is a limitation. The flooding occurs less often than once every 2 years during the growing season. A drainage system has been installed in most areas. Measures that maintain or improve the drainage system are needed. Subsurface tile drains function satisfactorily if suitable outlets are available. Dikes or diversions can reduce the extent of the crop damage caused by floodwater. A conservation tillage system that leaves crop residue on the surface after planting improves tilth, helps to prevent surface compaction and crusting, and increases the rate of water intake.

If this soil is used as woodland, the equipment limitation, seedling mortality, and windthrow are management concerns. They are caused by the wetness. Plant competition also is a concern. It affects the seedlings of desirable species. Machinery should be used only when the soil is firm enough to support the equipment. The seedling mortality rate can be reduced by planting species that can withstand excessive wetness. Harvesting methods that do not isolate the remaining trees or leave them widely spaced reduce the windthrow hazard. Only high-value trees should be removed from a strip 50 feet wide along the west and south edges of the woodland. The plant competition in openings where timber has been harvested 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. Measures that protect the woodland from fire are needed.

The land capability classification is IIw.

119D2—Elco silt loam, 10 to 15 percent slopes, eroded. This strongly sloping, moderately well drained soil is on side slopes in the uplands. Individual areas are long and irregular in shape and range from 3 to 125 acres in size.

Typically, the surface layer is brown, friable silt loam about 5 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part is yellowish brown, friable silt loam; the next part is yellowish brown and brown, mottled, firm silty clay loam; and the lower part is light brownish gray, mottled, firm silty clay loam. In some areas the lower part of the subsoil has a lower content of sand.

Included with this soil in mapping are small areas of very slowly permeable soils on the lower part of the slopes. These soils make up 5 to 10 percent of the unit.

Water and air move through the upper part of the Elco soil at a moderate rate and through the lower part at a moderately slow rate. Surface runoff is medium. A perched water table is 2.5 to 4.5 feet below the surface during the spring. The available water capacity is high. Organic matter content is moderately low. Reaction is strongly acid to neutral in the subsoil. It is neutral in the surface layer as a result of local liming practices. The shrink-swell potential is moderate, and the potential for frost action is high. The surface layer tends to crust after hard rains.

Most areas are used for pasture. Some are used for cultivated crops. This soil is well suited to woodland. It is moderately suited to cultivated crops, pasture, hay, and dwellings without basements. It is poorly suited to dwellings with basements and to septic tank absorption fields.

If this soil is used for corn, soybeans, or small grain, further erosion is a hazard. A crop rotation dominated by forage crops and a combination of contour farming and a conservation tillage system that leaves crop residue on the surface after planting help to keep soil loss within tolerable limits. Stripcropping also helps to control erosion. Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and productivity.

Adapted forage and hay crops grow well on this soil. Timely deferment of grazing helps to prevent overgrazing and thus also helps to prevent surface compaction, excessive runoff, and a greater susceptibility to erosion. Tilling on the contour when a seedbed is prepared or the pasture is renovated helps to control erosion. Applications of fertilizer are needed. The plants should not be grazed or clipped until they are sufficiently established.

If this soil is used as woodland, plant competition is a management concern. It affects the seedlings of desirable species. The competition in openings where timber has been harvested 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. Measures that protect the woodland from fire are needed.

If this soil is used as a site for dwellings without basements, the seasonal high water table, the shrink-swell potential, and the slope are limitations. Installing subsurface tile drains near the foundations lowers the water table. Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling. Cutting, filling, and land shaping help to overcome the slope.

The seasonal high water table, the moderately slow permeability, and the slope are limitations if this soil is used as a site for septic tank absorption fields. Installing subsurface tile drains higher on the side slopes than the absorption field helps to intercept seepage water. Increasing the size of the filter field or replacing the soil with more permeable material helps to overcome the moderately slow permeability. Installing the filter lines on the contour or cutting and filling help to overcome the slope.

The land capability classification is IIIe.

119D3—Elco silty clay loam, 10 to 15 percent slopes, severely eroded. This strongly sloping, moderately well drained soil is on side slopes in the uplands. Individual areas are long and irregular in shape and range from 3 to 50 acres in size.

Typically, the surface layer is exposed subsoil material. It is dark yellowish brown, firm silty clay loam about 5 inches thick. The subsoil to a depth of 60 inches is mottled, firm silty clay loam. The upper part is dark yellowish brown, the next part is grayish brown, and the lower part is light brownish gray. In some areas the lower part of the subsoil has a lower content of sand.

Included with this soil in mapping are small areas of very slowly permeable soils on the lower part of the slopes. These soils make up 5 to 10 percent of the unit.

Water and air move through the upper part of the Elco soil at a moderate rate and through the lower part at a moderately slow rate. Surface runoff is medium. A perched water table is 2.5 to 4.5 feet below the surface during the spring. The available water capacity is high. Organic matter content is low. Reaction is strongly acid to neutral in the subsoil. It is neutral in the surface layer as a result of local liming practices. The shrink-swell potential is moderate, and the potential for frost action is high. Tilth is poor in the surface layer. This layer becomes compact and cloddy if tilled when too wet.

Most areas are cultivated. Some are used for pasture. This soil is poorly suited to cultivated crops, well suited to woodland, and moderately suited to pasture and hay and to dwellings without basements. It is poorly suited to dwellings with basements and to septic tank absorption fields.

Unless the surface is protected, further erosion is a severe hazard in the areas used for corn, soybeans, or small grain. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, contour farming, terraces, and a crop rotation that is dominated by forage crops. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and help to maintain tilth.

Establishing pasture and hay crops helps to keep soil loss within tolerable limits. Seedbed preparation is difficult on severely eroded side slopes where the subsoil is exposed. A no-till method of pasture renovation or seeding helps to control further erosion. The plants should not be grazed until they are sufficiently established. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to prevent surface compaction and excessive runoff.

If this soil is used as woodland, plant competition is a management concern. It affects the seedlings of desirable species. The competition in openings where timber has been harvested 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. Measures that protect the woodland from fire are needed.

If this soil is used as a site for dwellings without basements, the seasonal high water table, the shrink-swell potential, and the slope are limitations. Installing subsurface tile drains near the foundations lowers the water table. Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling. Cutting, filling, and land shaping help to overcome the slope.

The seasonal high water table, the moderately slow permeability, and the slope are limitations if this soil is used as a site for septic tank absorption fields. Installing subsurface tile drains higher on the side slopes than the absorption field helps to intercept seepage water. Increasing the size of the filter field or replacing the soil with more permeable material helps to overcome the moderately slow permeability. Installing the filter lines on the contour or cutting and filling help to overcome the slope.

The land capability classification is IVe.

119E2—Elco silt loam, 15 to 20 percent slopes, eroded. This moderately steep, moderately well drained soil is on side slopes in the uplands. Individual areas are long and narrow and range from 3 to 30 acres in size.

Typically, the surface layer is dark grayish brown and dark yellowish brown, friable silt loam about 4 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part is yellowish brown, firm silty clay loam; the next part is brown and grayish brown, mottled, firm silty clay loam, and the lower part is grayish brown, mottled, firm clay loam. In some areas the soil has a higher content of sand and gravel. In other areas the lower part of the subsoil has a lower content of sand.

Included with this soil in mapping are small areas of very slowly permeable soils on the lower part of the slopes. These soils make up 5 to 10 percent of the unit.

Water and air move through the upper part of the Elco soil at a moderate rate and through the lower part at a moderately slow rate. Surface runoff is rapid. A perched water table is 2.5 to 4.5 feet below the surface during the spring. The available water capacity is high. Organic matter content is moderately low. Reaction is strongly acid or medium acid in the subsoil. It is mildly alkaline in the surface layer as a result of local liming practices. The shrink-swell potential is moderate, and the potential for frost action is high.

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

If this soil is used for corn, soybeans, or small grain, further erosion is a hazard. Also, poor tilth is a limitation. A conservation tillage system that leaves crop residue on the surface after planting, a crop rotation that is dominated by forage crops, contour farming, or a combination of these can help to keep soil loss within tolerable limits. Returning crop residue to the soil and regularly adding other organic material improve tilth and increase the rate of water intake.

Erosion control is needed when grasses and legumes are becoming established in the pastured areas. In areas where the pasture is established, seeding legumes on the contour improves forage quality and helps to control erosion. A permanent cover of pasture plants helps to control erosion and maintains tilth. Selection of suitable species for planting, proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture and the soil in good condition.

If this soil is used as woodland, the erosion hazard, the equipment limitation, seedling mortality, and plant competition are management concerns. Logging roads and skid trails should be established on the contour if possible. On the steeper slopes, the logs or trees should be skidded uphill with a cable and winch. Firebreaks should be the grass type. Bare logging areas should be seeded to grass or to a grass-legume mixture. Machinery should be used only when the soil is firm enough to support the equipment. The seedling mortality rate can be reduced by eliminating all competing vegetation near the seedlings and by selecting the larger seedlings for planting. 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.

This soil is suitable for grain and seed crops, for wild herbaceous plants, and for hardwood trees, all of which are needed in areas of woodland wildlife habitat. Food plots of grain or seed crops should be established only in the less steep areas. Also, the crops should be planted on the contour. Measures that protect the habitat from fire and grazing are needed.

The land capability classification is IVe.

131B—Alvin fine sandy loam, 2 to 7 percent slopes. This gently sloping, well drained soil is on ridges on uplands and terraces. Individual areas are long and irregular in shape and range from 3 to 50 acres in size.

Typically, the surface layer is brown, very friable fine sandy loam about 10 inches thick. The subsoil is dark yellowish brown sandy loam about 26 inches thick. The upper part is friable, the next part is firm, and the lower part is friable. The upper part of the underlying material is yellowish brown, loose loamy sand. The lower part to a depth of 60 inches is strong brown, friable sandy loam. In some areas the subsoil has more clay. In other areas it has more sand and less clay.

Included with this soil in mapping are small areas of the somewhat excessively drained Bloomfield soils. These soils are in landscape positions similar to those of the Alvin soil. Also included are poorly drained soils in small depressions. Included soils make up 5 to 8 percent of the unit.

Water and air move through the Alvin soil at a moderately rapid rate. Surface runoff is slow. The available water capacity is moderate. Organic matter content is low. Reaction is slightly acid in the subsoil and surface layer. The potential for frost action is moderate.

Most areas are cultivated. Some are used for pasture. This soil is moderately suited to cultivated crops. It is well suited to pasture and hay, woodland, dwellings, and septic tank absorption fields.

If this soil is used for corn, soybeans, or small grain, erosion and soil blowing are hazards. Also, the moderate available water capacity and the level of fertility are limitations. Erosion can be controlled and moisture conserved by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, or by terraces. Field windbreaks and a tillage system that leaves the surface rough are effective in controlling soil blowing.

Adapted forage and hay plants grow well on this soil. Timely deferment of grazing helps to prevent overgrazing and thus a greater susceptibility to erosion and soil blowing. The plants should not be grazed until they are sufficiently established. Applications of fertilizer are needed.

The land capability classification is IIe.

131D—Alvin fine sandy loam, 7 to 15 percent slopes. This strongly sloping, well drained soil is on side slopes on uplands and terraces. Individual areas are long and irregular in shape and range from 3 to 30 acres in size.

Typically, the surface soil is brown and dark yellowish brown, friable fine sandy loam about 12 inches thick. The subsoil is about 31 inches thick. The upper part is brown, friable fine sandy loam, and the lower part is strong brown, friable sandy loam. The upper part of the underlying material is strong brown, loose loamy sand. The lower part to a depth of 60 inches is strong brown, friable sandy loam. In some areas the subsoil has more clay. In other areas it has more sand and less clay.

Water and air move through this soil at a moderately rapid rate. Surface runoff is medium. The available water capacity is moderate. Organic matter content is low. Reaction is strongly acid or medium acid in the subsoil and medium acid in the surface layer. The potential for frost action is moderate.

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

If this soil is used for corn, soybeans, or small grain, erosion and soil blowing are hazards. Also, the moderate available water capacity and the level of fertility are limitations. Erosion can be controlled and moisture conserved by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, by terraces, or by a combination of these. Field windbreaks and a tillage system that leaves the surface rough are effective in controlling soil blowing.

Adapted forage and hay plants grow well on this soil. Timely deferment of grazing helps to prevent overgrazing and thus a greater susceptibility to erosion and soil blowing. The plants should not be grazed or clipped until they are sufficiently established. Planting on the contour helps to control erosion.

If this soil is used as woodland, plant competition is a management concern. It affects the seedlings of desirable species. The competition in openings where timber has been harvested 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. Measures that protect the woodland from fire are needed.

This soil is suitable for grain and seed crops, for wild herbaceous plants, and for hardwood trees, all of which are needed in areas of woodland wildlife habitat. Food plots of grain or seed crops should be established only in the less steep areas. Also, the crops should be planted on the contour. Measures that protect the habitat from fire and grazing are needed.

If this soil is used as a site for dwellings or septic tank absorption fields, the slope is a limitation. Cutting, filling, and land shaping help to overcome this limitation on sites for dwellings. Installing the filter lines on the contour helps to overcome this limitation on sites for septic tank absorption fields.

The land capability classification is IIIe.

150B—Onarga fine sandy loam, 1 to 5 percent slopes. This gently sloping, well drained soil is on terrace ridges and side slopes. Individual areas are irregular in shape and range from 3 to 50 acres in size.

Typically, the surface layer is very dark brown, very friable fine sandy loam about 9 inches thick. The subsurface layer is very dark grayish brown, very friable fine sandy loam about 7 inches thick. The subsoil is brown and dark yellowish brown, friable and firm sandy loam about 21 inches thick. The underlying material to a depth of 60 inches is brown and dark yellowish brown, loose, stratified loamy sand, sandy loam, and sand. In some areas the surface layer is lighter in color. In other areas the subsoil has a higher content of clay.

Included with this soil in mapping are small areas of the excessively drained Dickinson and somewhat poorly drained Hoopeston soils. These soils are in the less sloping areas below the Onarga soil. They 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 lower part at a rapid rate. Surface runoff is slow. The available water capacity is moderate. Organic matter content also is moderate. Reaction is medium acid in the subsoil and surface layer. The potential for frost action is moderate.

Most areas are cultivated. This soil is moderately suited to cultivated crops. It is well suited to dwellings but is poorly suited to septic tank absorption fields.

If this soil is used for corn, soybeans, or small grain, erosion and soil blowing are hazards. Also, the moderate available water capacity and the level of fertility are limitations. Applying a system of conservation tillage that leaves crop residue on the surface after planting and regularly adding other organic material help to control erosion and soil blowing, conserve moisture, and improve fertility.

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 from septic tanks. The poor filtering capacity can result in the pollution of ground water. Filling or mounding with suitable material increases the filtering capacity of the field.

The land capability classification is IIe.

172A—Hoopeston sandy loam, 0 to 3 percent slopes. This nearly level, somewhat poorly drained soil is on low terraces. Individual areas are irregular in shape and range from 5 to 200 acres in size.

Typically, the surface layer is very dark brown, very friable sandy loam about 10 inches thick. The subsurface layer is very dark grayish brown, very friable sandy loam about 11 inches thick. The subsoil is about 32 inches thick. It is mottled and friable. The upper part is brown sandy loam, the next part is dark yellowish brown sandy loam, and the lower part is dark yellowish brown sandy loam and loamy sand. The underlying material to a depth of 60 inches is dark yellowish brown, mottled, loose sand that has thin strata of loamy sand. In some areas the subsoil has more clay. Some terrace side slopes are more sloping.

Included with this soil in mapping are small areas of the excessively drained Sparta and well drained Onarga soils. These soils are on the crest of ridges above the Hoopeston soil. They make up 10 to 15 percent of the unit.

Water and air move through the upper part of the Hoopeston soil at a moderately rapid rate and through the lower part at a rapid rate. Surface runoff is slow. A seasonal high water table is 1 to 3 feet below the surface in late winter and in spring. The available water capacity is moderate. Organic matter content also is moderate. Reaction is slightly acid or neutral in the subsoil and neutral in the surface layer. The potential for frost action is high.

Most areas are cultivated. This soil is moderately suited to cultivated crops. It is poorly suited to dwellings and septic tank absorption fields.

If this soil is used for corn, soybeans, or small grain, the moderate available water capacity and the level of fertility are limitations and soil blowing is a hazard. A system of conservation tillage that leaves crop residue on the surface after planting and regularly adding other organic material help to control soil blowing, conserve moisture, and improve fertility.

If this soil is used as a site for dwellings, the seasonal high water table is a limitation. Installing subsurface tile drains near the foundation helps to overcome this limitation.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table and a poor filtering capacity in the underlying material are limitations. The soil readily absorbs but does not adequately filter the effluent from septic tanks. The poor filtering capacity can result in the pollution of ground water. Underground drains help to lower the water table. Mounding with suitable fill material increases the filtering capacity of the field and the depth to the seasonal high water table.

The land capability classification is IIs.

180—Dupo silt loam. This nearly level, somewhat poorly drained soil is on broad bottom land. It is protected by levees but is still subject to rare flooding. Individual areas are irregular in shape and range from 10 to 250 acres in size.

Typically, the surface layer is dark grayish brown, friable silt loam about 8 inches thick. The subsurface layer also is dark grayish brown, friable silt loam. It is about 3 inches thick. The next layer is stratified brown and dark grayish brown, mottled, friable silt loam about 15 inches thick. Below this to a depth of 60 inches is a buried soil of black and very dark gray, mottled, firm silty clay. In some areas depth to the buried soil is less than 20 inches, and in other areas it is more than 60 inches. In places the buried soil has a lower content of clay.

Included with this soil in mapping are small areas where the soil is ponded for long periods. These areas make up 5 to 10 percent of the unit.

Water and air move through the upper part of the Dupo soil at a moderate rate and through the buried soil at a slow rate. Surface runoff is slow. A seasonal high water table is 1.5 to 3.5 feet below the surface during the spring. The available water capacity is high. Organic matter content is moderately low. Reaction is neutral below the surface layer. It is mildly alkaline in the surface layer as a result of local liming practices. The shrink-swell potential and the potential for frost action are high. The surface layer tends to crust after hard rains.

Most areas are cultivated. This soil is well suited to cultivated crops. 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, the wetness delays planting in some years. It can be reduced, however, by surface ditches or subsurface drains. Tilling when the soil is wet causes surface cloddiness and compaction. Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

The land capability classification is IIw.

200—Orio sandy loam. This nearly level, poorly drained soil is in depressions or low areas on terraces. It is subject to ponding. Individual areas are irregular in shape and range from 3 to 100 acres in size.

Typically, the surface layer is very dark grayish brown, very friable sandy loam about 9 inches thick. The subsurface layer is dark grayish brown and grayish brown, mottled, very friable sandy loam about 16 inches thick. The subsoil is about 29 inches thick. It is firm and mottled. The upper part is grayish brown sandy clay loam, the next part is grayish brown clay loam, and the lower part is grayish brown and light brownish gray sandy clay loam. The underlying material to a depth of 60 inches is brown, mottled, stratified sandy loam and sandy clay loam. In some areas the subsurface layer is thicker. In other areas the subsoil has less clay. In a few places the dark surface layer is thicker.

Included with this soil in mapping are small areas of the excessively drained Plainfield and somewhat poorly drained Hoopeston soils. Plainfield soils are droughty. They are on ridges. Hoopeston soils are not subject to ponding and are higher on the landscape than the Orio soil. Included soils make up 5 to 10 percent of the unit.

Water and air move through the Orio soil at a moderately slow rate. Surface runoff is ponded. A seasonal high water table is 0.5 foot above the surface to 1.0 foot below during the spring. The available water capacity is high. The organic matter content is moderately low. Reaction is slightly acid in the subsoil. It is neutral in the surface layer as a result of local liming practices. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is moderately suited to cultivated crops. It is generally unsuited to dwellings and septic tank absorption fields because of the ponding and the moderately slow permeability.

If drained, this soil can be used for corn, soybeans, and small grain. A drainage system has been installed in most areas. Measures that maintain or improve the drainage system are needed. Surface drains, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. Land grading helps to control the ponding. Applying a conservation tillage system that leaves crop residue on the surface after planting and returning crop residue to the soil improve tilth, help to prevent surface compaction, and increase the rate of water intake.

The land capability classification is IIw.

242B—Kendall silt loam, 1 to 5 percent slopes. This gently sloping, somewhat poorly drained soil is on terraces. Individual areas are irregular in shape and are 5 to 10 acres in size.

Typically, the surface layer is dark grayish brown and brown, friable silt loam about 8 inches thick. The subsurface layer is grayish brown and brown, mottled, friable silt loam about 6 inches thick. The subsoil is mottled, firm silty clay loam about 43 inches thick. The upper part is brown, and the lower part is grayish brown. The underlying material to a depth of 60 inches is yellowish brown and light yellowish brown, mottled, friable silt loam. In some areas the subsurface layer is thicker.

Included with this soil in mapping are small areas of well drained soils on the crest of terrace ridges and on the steeper side slopes. These soils make up 10 to 15 percent of the unit.

Water and air move through the Kendall soil at a moderate rate. Surface runoff is medium. A seasonal high water table is 1 to 3 feet below the surface during the spring. The available water capacity is high. Organic matter content is moderate. Reaction is strongly acid in the upper part of the subsoil and moderately alkaline in the lower part. It is neutral in the surface layer as a result of local liming practices. The shrink-swell potential is moderate, and the potential for frost action is high. The surface layer tends to crust after hard rains.

Most areas are cultivated. This soil is well suited to cultivated crops. It is poorly suited to dwellings and septic tank absorption fields.

In the areas used for corn, soybeans, or small grain, erosion is a hazard unless the surface is protected. Also, the wetness can delay planting in some years. It can be reduced by surface ditches or subsurface tile. Erosion can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, by contour farming, or by terraces. Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.

If this soil is used as a site for dwellings, the seasonal high water table and the shrink-swell potential are limitations. Installing subsurface tile drains near the foundations helps overcome the wetness. Extending the footings below the subsoil or 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. Subsurface tile drains lower the water table. Increasing the size of the filter field or replacing the soil with more permeable material helps to overcome the moderate permeability.

The land capability classification is IIe.

244—Hartsburg silty clay loam. This nearly level, poorly drained soil is on broad, low upland flats. It is subject to ponding. Individual areas are irregular in shape and range from 10 to 250 acres in size.

Typically, the surface layer is black, firm silty clay loam about 7 inches thick. The subsurface layer is very dark gray, mottled, firm silty clay loam about 6 inches thick. The subsoil is calcareous, friable silty clay loam about 36 inches thick. It is mottled. The upper part is dark grayish brown, and the lower part is grayish brown. The underlying material to a depth of 60 inches is light brownish gray and light yellowish brown, mottled, calcareous, friable silt loam. In some areas the upper part of the subsoil is more acid. In other areas the dark surface soil is more than 24 inches thick. In a few places the subsoil has a higher content of clay.

Included with this soil in mapping are small areas of the somewhat poorly drained Ipava soils on slight rises above the Hartsburg soil. These soils are not subject to ponding. They make up 5 to 10 percent of the unit.

Water and air move through the Hartsburg soil at a moderate rate. Surface runoff is slow or ponded. A seasonal high water table is 0.5 foot above the surface to 2.0 feet below during the spring. The available water capacity is high. Organic matter content also is high. Reaction is neutral or mildly alkaline in the subsoil and neutral in the surface layer. The shrink-swell potential is moderate, and the potential for frost action is high. The surface layer becomes compact and cloddy if tilled when too wet.

Most areas are cultivated. This soil is well suited to cultivated crops. It is poorly suited to dwellings and septic tank absorption fields.

If drained, this soil can be used for corn, soybeans, and small grain. A drainage system has been installed in most areas. Measures that maintain or improve the drainage system are needed. Surface drains, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. Land grading helps to control the ponding. Applying a conservation tillage system that leaves crop residue on the surface after planting and returning crop residue to the soil improve tilth, help to prevent surface compaction, and increase the rate of water intake.

If this soil is used as a site for dwellings, the ponding is a hazard and the shrink-swell potential is a limitation. The hazard of ponding can be reduced by diverting surface water or constructing the building on raised fill material. Subsurface tile drains and surface inlet tile drains help to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

The seasonal high water table and the moderate permeability are limitations if this soil is used as a site for septic tank absorption fields. Subsurface tile drains lower the water table. Grading and land shaping help to remove excess surface water. Adding several feet of suitable fill material reduces the hazard of ponding and helps to overcome the moderate permeability.

The land capability classification is IIw.

257A—Clarksdale silt loam, 0 to 3 percent slopes. This nearly level, somewhat poorly drained soil is on uplands. Individual areas are narrow and irregular in shape and range from 3 to 100 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 9 inches thick. The subsurface layer is dark grayish brown, friable silt loam about 10 inches thick. The subsoil is mottled, firm silty clay loam about 37 inches thick. The upper part is brown, the next part is yellowish brown, and the lower part is light brownish gray. The underlying material to a depth of 60 inches is light olive, mottled, friable silt loam. In some areas the dark surface layer is thicker. In other areas the surface layer is lighter in color. In a few places the seasonal high water table is at a depth of more than 3 feet.

Included with this soil in mapping are small areas of the poorly drained Virden soils. These soils are in drainageways and low areas below the Clarksdale soil and are subject to ponding. They make up 5 to 10 percent of the unit.

Water and air move through the Clarksdale soil at a moderately slow rate. Surface runoff is slow. A seasonal high water table is 1 to 3 feet below the surface during the spring. The available water capacity is high. The organic matter content is moderate. Reaction is strongly acid to slightly acid in the subsoil and is slightly acid in the surface layer. The shrink-swell potential and the potential for frost action are high.

Most areas are cultivated or are used for pasture. This soil is well suited to cultivated crops, pasture, and hay. It is poorly suited to dwellings and septic tank absorption fields.

No major limitations affect the use of this soil for corn, soybeans, or small grain. The seasonal high water table can delay planting in some years. Subsurface tile drains function satisfactorily if suitable outlets are available. A conservation tillage system that leaves crop residue on the surface after planting helps 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 subsurface tile drains near the foundations helps to overcome the wetness. Extending the footings below the subsoil or 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. Subsurface tile drains lower the water table. Grading and land shaping help to remove surface water. Increasing the size of the filter field or replacing the soil with more permeable material helps to overcome the moderately slow permeability.

The land capability classification is I.

259C2—Assumption silt loam, 5 to 10 percent slopes, eroded. This moderately sloping, moderately well drained soil is on side slopes in the uplands. Individual areas are long and irregular in shape and range from 10 to 150 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 9 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part is dark yellowish brown, friable silt loam, the next part is dark yellowish brown, firm silty clay loam, and the lower part is grayish brown, mottled, firm silty clay loam. In some areas the lower part of the subsoil has a lower content of sand.

Water and air move through the upper part of this soil at a moderate rate and through the lower part at a moderately slow rate. Surface runoff is medium. A perched water table is 2.5 to 4.5 feet below the surface in late winter and in spring. The available water capacity is high. Organic matter content is moderate. Reaction is slightly acid in the subsoil. It is neutral in the surface layer as a result of local liming practices. 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 suited to dwellings and poorly suited to septic tank absorption fields.

If this soil is used for corn, soybeans, or small grain, erosion is a hazard and tilth is a problem. Soil loss can be kept within tolerable limits by a crop rotation that includes 1 or more years of forage crops, by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, by terraces, or by a combination of these. Returning crop residue to the soil and regularly adding other organic material help to maintain productivity, prevent crusting, and improve tilth.

If this soil is used as a site for dwellings with basements, the seasonal high water table and the shrink-swell potential are limitations. The shrink-swell potential also is a limitation on sites for dwellings without basements. Installing subsurface tile drains near the foundations helps to overcome the wetness. Extending the footings below the subsoil or 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. Installing subsurface tile drains higher on the side slopes than the absorption field helps to intercept seepage water. Increasing the size of the filter field or replacing the soil with more permeable material helps to overcome the moderately slow permeability.

The land capability classification is IIIe.

259D2—Assumption silt loam, 10 to 15 percent slopes, eroded. This strongly sloping, moderately well drained soil is on side slopes in the uplands. Individual areas are long and irregular in shape and range from 5 to 75 acres in size.

Typically, the surface layer is very dark grayish brown and dark brown, friable silt loam about 7 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part is brown and dark yellowish brown, firm silty clay loam; the next part is olive brown, mottled, firm silty clay loam; and the lower part is gray, mottled, firm clay loam. In some areas the lower part of the subsoil has a lower content of sand.

Water and air move through the upper part of this soil at a moderate rate and through the lower part at a moderately slow rate. Surface runoff is medium. A perched water table is 2.5 to 4.5 feet below the surface in late winter and in spring. The available water capacity is high. Organic matter content is moderate. Reaction is slightly acid in the subsoil. It is mildly alkaline in the surface layer as a result of local liming practices. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is a moderately suited to cultivated crops. It is moderately suited to dwellings and poorly suited to septic tank absorption fields.

If this soil is used for corn, soybeans, or small grain, further erosion is a hazard. A crop rotation dominated by forage crops and a combination of contour farming and a conservation tillage system that leaves crop residue on the surface after planting help to keep soil loss within tolerable limits. Stripcropping also helps to control erosion. Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and productivity.

If this soil is used as a site for dwellings with basements, the seasonal high water table, the slope, and the shrink-swell potential are limitations. The shrink-swell potential and the slope also are limitations on sites for dwellings without basements. Installing subsurface tile drains near the foundations helps to overcome the wetness. Cutting, filling, and land shaping help to overcome the slope. Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

The seasonal high water table, the moderately slow permeability, and the slope are limitations if this soil is used as a site for septic tank absorption fields. Installing subsurface tile drains higher on the side slopes than the absorption field helps to intercept seepage water. Increasing the size of the filter field or replacing the soil with more permeable material helps to overcome the moderately slow permeability. Installing the filter lines on the contour or cutting and filling help to overcome the slope.

The land capability classification is IIIe.

279B—Rozetta silt loam, 2 to 5 percent slopes. This gently sloping, moderately well drained soil is on ridgetops and side slopes in the uplands. Individual areas are long and irregular in shape and range from 5 to 300 acres in size.

Typically, the surface soil is brown, friable silt loam about 11 inches thick. The subsoil is about 43 inches thick. The upper part is dark yellowish brown, friable silt loam; the next part is yellowish brown, mottled, firm silty clay loam; and the lower part is yellowish brown, mottled, friable silt loam. The underlying material to a depth of 60 inches is yellowish brown, mottled, friable silt loam. In some areas the subsoil has a higher content of clay. In other areas a seasonal high water table is within a depth of 4 feet.

Water and air move through this soil at a moderate rate. Surface runoff is medium. A seasonal high water is 4 to 6 feet below the surface during the spring. The available water capacity is very high. Organic matter content is moderately low. Reaction is strongly acid or medium acid in the subsoil. It is neutral in the surface layer as a result of local liming practices. The shrink-swell potential is moderate, and the potential for frost action is high. The surface layer tends to crust after hard rains.

Most areas are cultivated. Some are used for pasture. This soil is well suited to cultivated crops, to pasture and hay, and to woodland. It is moderately suited to dwellings and septic tank absorption fields.

In areas used for corn, soybeans, or small grain, erosion is a hazard. It can be controlled by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, or by terraces. Returning crop residue to the soil and adding other organic material improve tilth.

Adapted forage and hay plants grow well on this soil. Timely deferment of grazing helps to prevent overgrazing and thus a greater susceptibility to erosion and soil blowing. The plants should not be grazed until they are sufficiently established. Applications of fertilizer are needed.

If this soil is used as woodland, plant competition is a management concern. It affects the seedlings of desirable species. The competition in openings where timber has been harvested 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. Measures that protect the woodland from fire are needed.

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. Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling. Installing subsurface tile drains near the foundations lowers the water table.

The seasonal high water table is a limitation if this soil is used as a site for septic tank absorption fields. Subsurface tile drains lower the water table.

The land capability classification is IIe.

279C2—Rozetta silt loam, 5 to 10 percent slopes, eroded. This moderately sloping, moderately well drained soil is on side slopes in the uplands. Individual areas are long and narrow and range from 3 to 100 acres in size.

Typically, the surface layer is brown, friable silt loam about 9 inches thick. The subsoil extends a depth of more than 60 inches. It is yellowish brown. The upper part is friable silty clay loam, the next part is mottled, firm silty clay loam, and the lower part is mottled, friable silt loam. In some areas the soil is calcareous within a depth of 40 inches. In severely eroded areas the surface layer has more clay.

Water and air move through this soil at a moderate rate. Surface runoff is medium. A seasonal high water table is 4 to 6 feet below the surface during the spring. The available water capacity is very high. Organic matter content is moderately low. Reaction is medium acid or slightly acid in the subsoil. It is neutral in the surface layer as a result of local liming practices. The shrink-swell potential is moderate, and the potential for frost action is high. The surface layer tends to crust after hard rains.

Most areas are cultivated. Some are used for pasture. This soil is moderately suited to cultivated crops and well suited to pasture, hay, and woodland. It is moderately suited to dwellings and septic tank absorption fields.

If this soil is used for corn, soybeans, or small grain, further erosion is a hazard. A crop rotation that includes 1 or more years of forage crops, a conservation tillage system that leaves crop residue on the surface after planting, contour farming, terraces, or a combination of these can help to keep soil loss within tolerable limits. Returning crop residue to the soil and regularly adding other organic material help to maintain productivity and tilth.

Adapted forage and hay plants grow well on this soil. Timely deferment of grazing helps to prevent overgrazing and thus a greater susceptibility to erosion and soil blowing. The plants should not be grazed until they are sufficiently established. Applications of fertilizer are needed.

If this soil is used as woodland, plant competition is a management concern. It affects the seedlings of desirable species. The competition in openings where timber has been harvested 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. Measures that protect the woodland from fire are needed.

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. Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling. Installing subsurface tile drains near the foundations lowers the water table.

The seasonal high water table is a limitation if this soil is used as a site for septic tank absorption fields. Subsurface tile drains lower the water table.

The land capability classification is IIIe.

279C3—Rozetta silty clay loam, 5 to 10 percent slopes, severely eroded. This moderately sloping, moderately well drained soil is on side slopes in the uplands. Individual areas are long and narrow and range from 5 to 50 acres in size.

Typically, the surface layer is exposed subsoil material. It is yellowish brown, firm silty clay loam about 5 inches thick. The subsoil is yellowish brown silty clay loam about 32 inches thick. The upper part is firm, and the lower part is friable and mottled. The underlying material to a depth of 60 inches is pale brown and grayish brown, mottled, friable silt loam. In some areas a seasonal high water table is within a depth of 4 feet. In other areas the lower part of the subsoil has a higher content of sand.

Water and air move through this soil at a moderate rate. Surface runoff is medium. A seasonal high water table is 4 to 6 feet below the surface during the spring. The available water capacity is very high. Organic matter content is low. Reaction is strongly acid in the subsoil and in the surface layer. The shrink-swell potential is moderate, and the potential for frost action is high. The surface layer tends to crust after hard rains and becomes compact and cloddy if tilled when too wet.

Most areas are cultivated. This soil is poorly suited to cultivated crops. It is well suited to woodland and moderately suited to dwellings and septic tank absorption fields.

Unless the surface is protected, further erosion is a severe hazard in the areas used for corn, soybeans, or small grain. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, contour farming or terraces, and a crop rotation that is dominated by forage crops. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.

Establishing pasture and hay crops helps to keep soil loss within tolerable limits. Seedbed preparation is difficult on severely eroded side slopes where the subsoil is exposed. A no-till method of pasture renovation or seeding helps to control further erosion. The plants should not be grazed until they are sufficiently established. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to prevent surface compaction and excessive runoff.

If this soil is used as woodland, plant competition is a management concern. It affects the seedlings of desirable species. The competition in openings where timber has been harvested 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. Measures that protect the woodland from fire are needed.

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. Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling. Installing subsurface tile drains near the foundations lowers the water table.

The seasonal high water table is a limitation if this soil is used as a site for septic tank absorption fields. Subsurface tile drains lower the water table.

The land capability classification is IVe.

280B—Fayette silt loam, 2 to 5 percent slopes. This gently sloping, well drained soil is on upland ridgetops. Individual areas are long and narrow and range from 3 to 100 acres in size.

Typically, the surface soil is brown, friable silt loam about 10 inches thick. The subsoil extends to a depth of 60 inches. It is dark yellowish brown. The upper part is firm silty clay loam, and the lower part is friable silt loam. In some areas the subsoil has less clay. In other areas a seasonal high water table is within a depth of 6 feet.

Included with this soil in mapping are small areas of soils that have rapidly permeable sand below a depth of 40 inches. These soils are in landscape positions similar to those of the Fayette soil. They make up less than 5 percent of the unit.

Water and air move through the Fayette soil at a moderate rate. Surface runoff is medium. The available water capacity is high. Organic matter content is moderately low. Reaction is strongly acid to medium acid in the subsoil. It is neutral in the surface layer as a result of local liming practices. The shrink-swell potential is moderate, and the potential for frost action is high. The surface layer tends to crust after hard rains.

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

In areas used for corn, soybeans, or small grain, erosion is a hazard. It can be controlled by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, or by terraces. Returning crop residue to the soil and adding other organic material improve tilth.

Adapted forage and hay plants grow well on this soil. Timely deferment of grazing helps to prevent overgrazing and thus a greater susceptibility to erosion and soil blowing. The plants should not be grazed until they are sufficiently established. Applications of fertilizer are needed.

If this soil is used as woodland, plant competition is a management concern. It affects the seedlings of desirable species. The competition in openings where timber has been harvested 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. Measures that protect the woodland from fire are needed.

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

The land capability classification is IIe.

280C2—Fayette silt loam, 5 to 10 percent slopes, eroded. This moderately sloping, well drained soil is on ridgetops and side slopes in the uplands. Individual areas are long and narrow and range from 3 to 100 acres in size.

Typically, the surface layer is brown and dark yellowish brown, friable silt loam about 9 inches thick. The subsoil is dark yellowish brown silty clay loam about 36 inches thick. The upper part is firm, and the lower part is friable. The underlying material to a depth of 60 inches is dark yellowish brown, mottled, friable silt loam. In some areas the soil is calcareous at a depth of 40 inches or less. In severely eroded areas the surface layer has more clay.

Water and air move through this soil at a moderate rate. Surface runoff is medium. The available water capacity is high. Organic matter content is moderately low. Reaction is strongly acid or medium acid in the subsoil. It is neutral in the surface layer as a result of local liming practices. The shrink-swell potential is moderate, and the potential for frost action is high. The surface layer tends to crust after hard rains.

Most areas are cultivated. Some are used for pasture. This soil is moderately suited to cultivated crops. It is well suited to pasture and hay and to woodland. It is moderately suited to dwellings and well suited to septic tank absorption fields.

If this soil is used for corn, soybeans, or small grain, further erosion is a hazard. A crop rotation that includes 1 or more years of forage crops, a conservation tillage system that leaves crop residue on the surface after planting, contour farming, terraces, or a combination of these can help to keep soil loss within tolerable limits. Returning crop residue to the soil and regularly adding other organic material help to maintain productivity and tilth.

Adapted forage and hay plants grow well on this soil. Timely deferment of grazing helps to prevent overgrazing and thus a greater susceptibility to erosion and soil blowing. The plants should not be grazed until they are sufficiently established. Applications of fertilizer are needed.

If this soil is used as woodland, plant competition is a management concern. It affects the seedlings of desirable species. The competition in openings where timber has been harvested 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. Measures that protect the woodland from fire are needed.

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

The land capability classification is IIIe.

280D2—Fayette silt loam, 10 to 15 percent slopes, eroded. This strongly sloping, well drained soil is on side slopes in the uplands. Individual areas are long and irregular in shape and range from 5 to 50 acres in size.

Typically, the surface layer is brown and dark yellowish brown, friable silt loam about 7 inches thick. The subsoil extends to a depth of 60 inches. It is friable. The upper part is dark yellowish brown silt loam, the next part is dark yellowish brown silty clay loam, and the lower part is dark brown silt loam. In some areas the soil is calcareous at a depth of 40 inches or less. In severely eroded areas the surface layer has more clay. In places the lower part of the subsoil has a higher content of sand.

Water and air move through this soil at a moderate rate. Surface runoff is medium. The available water capacity is high. Organic matter content is moderately low. Reaction is medium acid or slightly acid in the subsoil. It is neutral in the surface layer as a result of local liming practices. The shrink-swell potential is moderate, and the potential for frost action is high. The surface layer tends to crust after hard rains.

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

If this soil is used for corn, soybeans, or small grain, further erosion is a hazard. A crop rotation dominated by forage crops and a combination of contour farming and a conservation tillage system that leaves crop residue on the surface after planting help to keep soil loss within tolerable limits. Stripcropping also helps to control erosion. Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and productivity.

Adapted forage and hay crops grow well on this soil. Timely deferment of grazing helps to prevent overgrazing and thus also helps to prevent surface compaction, excessive runoff, and a greater susceptibility to erosion. Tilling on the contour when a seedbed is prepared or the pasture is renovated helps to control erosion. Applications of fertilizer are needed. The plants should not be grazed or clipped until they are sufficiently established.

If this soil is used as woodland, plant competition is a management concern. It affects the seedlings of desirable species. The competition in openings where timber has been harvested 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. Measures that protect the woodland from fire are needed.

If this soil is used as a site for dwellings, the slope and the shrink-swell potential are limitations. Cutting, filling, and land shaping help to overcome the slope. Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

The slope is a limitation if this soil is used as a site for septic tank absorption fields. Installing the filter lines on the contour or cutting and land shaping help to overcome this limitation.

The land capability classification is IIIe.

280D3—Fayette silty clay loam, 10 to 15 percent slopes, severely eroded. This strongly sloping, well drained soil is on side slopes in the uplands. Individual areas are long and irregular in shape and range from 5 to 50 acres in size.

Typically, the surface layer is exposed subsoil material. It is brown, friable silty clay loam about 4 inches thick. The subsoil is about 37 inches thick. It is dark yellowish brown. The upper part is firm silty clay loam, and the lower part is friable silt loam. The underlying material to a depth of 60 inches is dark yellowish brown, friable silt loam. In some areas the soil is calcareous at a depth of 40 inches or less. In other areas the lower part of the soil has a higher content of sand.

Water and air move through this soil at a moderate rate. Surface runoff is medium. The available water capacity is high. Organic matter content is low. Reaction is strongly acid or medium acid in the subsoil and strongly acid in the surface layer. The shrink-swell potential is moderate, and the potential for frost action is high. The surface layer tends to crust after hard rains and becomes compact and cloddy if it is plowed when too wet.

Most areas are cultivated. This soil is poorly suited to cultivated crops. It is well suited to pasture, hay, and woodland. It is moderately suited to dwellings and septic tank absorption fields.

Unless the surface is protected, further erosion is a severe hazard in the areas used for soybeans, corn, or small grain. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, contour farming, terraces, and a crop rotation that is dominated by forage crops. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and help to maintain tilth.

Establishing pasture and hay crops helps to keep soil loss within tolerable limits. Seedbed preparation is difficult on severely eroded side slopes where the subsoil is exposed. A no-till method of pasture renovation or seeding helps to control further erosion. The plants should not be grazed until they are sufficiently established. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to prevent surface compaction and excessive runoff.

If this soil is used as woodland, plant competition is a management concern. It affects the seedlings of desirable species. The competition in openings where timber has been harvested 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. Measures that protect the woodland from fire are needed.

If this soil is used as a site for dwellings, the slope and the shrink-swell potential are limitations. Cutting, filling, and land shaping help to overcome the slope. Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

The slope is a limitation if this soil is used as a site for septic tank absorption fields. Installing the filter lines on the contour or cutting and land shaping help to overcome this limitation.

The land capability classification is IVe.

280E2—Fayette silt loam, 15 to 30 percent slopes, eroded. This steep, well drained soil is on side slopes in the uplands. Individual areas are long and irregular in shape and range from 5 to 75 acres in size.

Typically, the surface layer is brown and dark yellowish brown, friable silt loam about 7 inches thick. The subsoil is about 43 inches thick. It is dark yellowish brown. The upper part is friable silt loam, the next part is firm silty clay loam, and the lower part is mottled, friable silt loam. The underlying material to a depth of 60 inches is dark yellowish brown, mottled, friable silt loam. In some areas the soil is calcareous at a depth of 40 inches or less. In other areas it has a higher content of sand. In a few places the subsoil has a lower content of clay.

Water and air move through this soil at a moderate rate. Surface runoff is rapid. The available water capacity is high. Organic matter content is moderately low. Reaction is strongly acid to slightly acid in the subsoil and slightly acid in the surface layer. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are used for pasture or cultivated crops. Some are wooded. Because of the slope, this soil is generally unsuited to cultivated crops, dwellings, and septic tank absorption fields. It is well suited to pasture and hay, to woodland, and to habitat for woodland wildlife.

Erosion control is needed when grasses and legumes are becoming established in the pastured areas. In areas where the pasture is established, seeding legumes on the contour improves forage quality and helps to control erosion. A permanent cover of pasture plants helps to control erosion and maintains tilth. Selection of suitable species for planting, proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture and the soil in good condition.

If this soil is used as woodland, the erosion hazard and the equipment limitation are management concerns. They are caused by the slope. Plant competition also is a management concern. It affects the seedlings of desirable species. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Logging roads and skid trails should be established on the contour if possible. On the steeper slopes, the logs or trees should be skidded uphill with a cable and winch. Firebreaks should be the grass type. Bare logging areas should be seeded to grass or to a grass-legume mixture. Machinery should be used only when the soil is firm enough to support the equipment. 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.

This soil is suitable for grain and seed crops, for wild herbaceous plants, and for hardwood trees, all of which are needed in areas of woodland wildlife habitat. Food plots of grain or seed crops should be established only in the less steep areas. Also, the crops should be planted on the contour. Measures that protect the habitat from fire and grazing are needed.

The land capability classification is VIe.

284—Tice silt loam. This nearly level, somewhat poorly drained soil is on bottom land. It is protected by levees but is still subject to rare flooding. Individual areas are irregular in shape and range from 15 to 200 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 10 inches thick. The subsoil is about 39 inches thick. It is mottled and firm. The upper part is brown silty clay loam, the next part is dark grayish brown silty clay loam, and the lower part is grayish brown silt loam. The underlying material to a depth of 60 inches is light brownish gray, mottled, friable silt loam. In some areas the subsoil has a lower content of clay.

Included with this soil in mapping are small areas of the poorly drained Wagner soils and other soils on the low parts of the landscape that are subject to ponding. These soils make up less than 5 percent of the unit.

Water and air move through the Tice soil at a moderate rate. Surface runoff is slow. A seasonal high water table is 1.5 to 3.0 feet below the surface during the spring. The available water capacity is high. Organic matter content is moderate. Reaction is neutral in the subsoil and slightly acid in the surface layer. 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 generally unsuited to dwellings and septic tank absorption fields because of the flooding.

No major limitations affect the use of this soil for corn, soybeans, or small grain. The seasonal high water table can delay planting in some years. Subsurface tile drains function satisfactorily if suitable outlets are available. A conservation tillage system that leaves crop residue on the surface after planting helps to maintain tilth and fertility.

The land capability classification is I.

288—Petrolia silt loam. This nearly level, poorly drained soil is on bottom land. It is subject to ponding. It is protected by levees but is still subject to rare flooding. Individual areas are long and irregular in shape and range from 75 to 300 acres in size.

Typically, the surface layer is dark grayish brown, friable silt loam about 7 inches thick. The underlying material to a depth of 60 inches is dark grayish brown, mottled, firm silty clay loam. In some areas the soil is not subject to ponding.

Water and air move through this soil at a moderately slow rate. Surface runoff is slow or ponded. A seasonal high water table is 0.5 foot above the surface to 3.0 feet below during the spring. The available water capacity is high. Organic matter content is moderate. Reaction is neutral in the underlying material and slightly acid in the surface layer. 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 generally unsuited to dwellings and septic tank absorption fields because of the flooding.

If drained, this soil can be used for corn, soybeans, and small grain. A drainage system has been installed in most areas. Measures that maintain or improve the drainage system are needed. Surface drains, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. Land grading helps to control ponding. Applying a conservation tillage system that leaves crop residue on the surface after planting and returning crop residue to the soil improve tilth, help to prevent surface compaction, and increase the rate of water intake.

The land capability classification is IIw.

302—Ambraw clay loam. This nearly level, poorly drained soil is on broad bottom land. It is protected by levees but is still subject to rare flooding. Individual areas are irregular in shape and range from 3 to 200 acres in size.

Typically, the surface layer is very dark gray, firm clay loam about 8 inches thick. The subsurface layer also is very dark gray, firm clay loam about 8 inches thick. The subsoil is about 37 inches thick. It is mottled and firm.

The upper part is dark gray clay loam and sandy clay loam, the next part is gray sandy clay loam, and the lower part is dark grayish brown sandy clay loam that has thin strata of loamy sand. The underlying material to a depth of 60 inches is grayish brown, mottled, friable sandy loam. In some areas the lower part of the subsoil and underlying material contain more sand. In other areas a seasonal high water table is at a depth of more than 2 feet.

Included with this soil in mapping are small areas of the very slowly permeable Darwin soils in swales. These soils make up 5 to 10 percent of the unit.

Water and air move through the Ambraw soil at a moderately slow rate. Surface runoff is slow. A seasonal high water table is within a depth of 2 feet during the spring. The available water capacity is high. Organic matter content is moderate. Reaction is slightly acid or neutral in the subsoil and neutral in the surface layer. The shrink-swell potential is moderate, and potential for frost action is high. The surface layer becomes compact and cloddy if it is tilled when too wet.

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

If drained, this soil can be used for corn, soybeans, and small grain. A drainage system has been installed in most areas. Measures that maintain or improve the drainage system are needed. Surface drains, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. Land grading helps to control ponding. Applying a conservation tillage system that leaves crop residue on the surface after planting and returning crop residue to the soil improve tilth, help to prevent surface compaction, and increase the rate of water intake.

The land capability classification is IIw.

333—Wakeland silt loam. This nearly level, somewhat poorly drained soil is on bottom land. It is frequently flooded for brief periods in the spring. Individual areas are long and irregular in shape and range from 5 to 500 acres in size.

Typically, the surface layer is dark grayish brown and brown, friable silt loam about 10 inches thick. The underlying material to a depth of 60 inches is stratified dark grayish brown and brown, mottled, friable silt loam. In places the surface layer is darker. In a few places the underlying material has a higher content of clay. In some areas the soil is calcareous and has a seasonal high water table at a depth of more than 3 feet. In other areas a dark buried soil is within a depth of 40 inches.

Water and air move through this soil at a moderate rate. Surface runoff is slow. A seasonal high water table is 1 to 3 feet below the surface during the winter and early spring. The available water capacity is very high. Organic matter content is moderately low. Reaction is neutral in the underlying material. As a result of local liming practices, it also is neutral in the surface layer. The potential for frost action is high. The surface layer tends to crust after hard rains.

Most areas are cultivated. This soil is well suited to cultivated crops. 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, the wetness or the flooding delays planting in most years. Crops are occasionally damaged by floodwater. The wetness can be reduced by surface ditches or subsurface drains. Tilling when the soil is wet causes surface cloddiness and excessive runoff and erosion. Returning crop residue to the soil and minimizing tillage help to maintain good tilth and increase the rate of water infiltration.

The land capability classification is IIw.

415—Orion silt loam. This nearly level, somewhat poorly drained soil is on bottom land. It is frequently flooded for brief periods in the spring. Individual areas are irregular in shape and range from 3 to 300 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 5 inches thick. The subsurface layer is brown, friable silt loam about 11 inches thick. The underlying material is dark grayish brown and brown, mottled, friable silt loam about 16 inches thick. Below this to a depth of 60 inches is a buried soil. The upper part of the buried soil is black and very dark gray, mottled, friable silt loam, and the lower part is very dark grayish brown, mottled, firm silty clay loam. In some areas the dark surface layer is thicker. In other areas the soil does not have a buried soil within a depth of 40 inches. In a few places the depth to a seasonal high water table is more than 3 feet.

Water and air move through this soil at a moderate rate. Surface runoff is slow. A seasonal high water table is 1 to 3 feet below the surface during winter and spring. The available water capacity is very high. Organic matter content is moderately low. Reaction is neutral in the underlying material and slightly acid in the surface layer. This layer tends to crust after hard rains. The potential for frost action is high.

Most areas are cultivated or used for pasture. This soil is well suited to cultivated crops and pasture. It is generally unsuited to dwellings and septic tank absorption fields because of the flooding.

In the areas used for soybeans, corn, or small grain, the wetness or the flooding delays planting in most years. Crops are occasionally damaged by floodwater. The wetness can be reduced by surface ditches or subsurface drains. Tilling when the soil is wet causes surface cloddiness and excessive runoff and erosion. Returning crop residue to the soil and minimizing tillage help to maintain good tilth and increase the rate of water infiltration.

In areas used for pasture or hay, the flooding is a hazard and the seasonal wetness is a limitation. Dikes and diversions help to control the flooding, and subsurface tile drains lower the water table. Overgrazing causes surface compaction and poor tilth. Proper stocking rates, rotation grazing, restricted use during wet periods, and applications of fertilizer help to keep the pasture in good condition. The flooding delays harvesting of hay in some years.

The land capability classification is IIlw.

451—Lawson silt loam. This nearly level, somewhat poorly drained soil is on bottom land. It is frequently flooded for brief periods in the spring. Individual areas are long and irregular in shape and range from 5 to 500 acres in size.

Typically, the surface layer is black, friable silt loam about 11 inches thick. The subsurface layer is black and very dark grayish brown, friable silt loam about 24 inches thick. The underlying material to a depth of 60 inches is brown and dark grayish brown, friable silt loam. In some areas as much as 15 inches of light colored, silty overwash is on the surface. In other areas the underlying material has a higher content of clay.

Water and air move through this soil at a moderate rate. Surface runoff is slow. A seasonal high water table is 1 to 3 feet below the surface during the winter and spring. The available water capacity is very high. Organic matter content is moderate. The surface soil is slightly acid or neutral. The potential for frost action is high.

Most areas are cultivated or used for pasture. This soil is well suited to cultivated crops and pasture. It is generally unsuited to dwellings and septic tank absorption fields because of the flooding.

In the areas used for soybeans, corn, or small grain, the wetness or the flooding delays planting in most years. Crops are occasionally damaged by floodwater. The wetness can be reduced by surface ditches or subsurface drains. Tilling when the soil is wet causes surface cloddiness and excessive runoff and erosion. Returning crop residue to the soil and minimizing tillage help to maintain good tilth and increase the rate of water infiltration.

In areas used for pasture or hay, the flooding is a hazard and the seasonal wetness is a limitation. Dikes and diversions help to control the flooding, and subsurface tile drains lower the water table. Overgrazing causes surface compaction and poor tilth. Proper stocking rates, rotation grazing, restricted use during wet periods, and applications of fertilizer help to keep the pasture in good condition. The flooding delays harvesting of hay in some years.

The land capability classification is IIlw.

533—Urban land. This map unit occurs as 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 Jacksonville, but some are industrial areas south of Meredosia. Individual areas are 10 to 100 acres in size. They commonly are square or rectangular, but some are long and narrow.

More than 85 percent of this map unit is covered by buildings and pavement. Most of the paved areas are parking lots adjacent shopping centers, industrial plants, and other commercial buildings. The soils have been so extensively modified by cutting and filling that the soil series cannot be identified.

Included with the Urban land in mapping are small areas of Ipava, Sable, and Tama soils. The poorly drained Sable and somewhat poorly drained Ipava soils are in slight depressions and drainageways. The moderately well drained Tama soils are in the more sloping landscape positions. 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 into storm drainage systems. In some areas, however, it is diverted onto adjacent soils. This additional water causes erosion on these soils and causes flooding in some areas.

This map unit is not assigned to a land capability classification.

567C2—Elkhart silt loam, 5 to 10 percent slopes, eroded. This moderately sloping, well drained soil is on side slopes in the uplands. Individual areas are long and narrow and range from 5 to 200 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 9 inches thick. The subsoil is about 19 inches thick. It is dark yellowish brown and friable. The upper part is silty clay loam, and the lower part is calcareous, mottled silt loam. The underlying material to a depth of 60 inches is pale brown, light olive brown, and light brownish gray, mottled, friable, calcareous silt loam. In some areas the soil is calcareous within a depth of 20 inches. In other areas it is more sloping.

Water and air move through this soil at a moderate rate. Surface runoff is medium. The available water capacity is very high. Organic matter content is moderate. Reaction is neutral to moderately alkaline in the subsoil and slightly acid in the surface layer. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. Some are used for pasture. This soil is well suited to cultivated crops, pasture, and hay. It is moderately suited to dwellings without basements and well suited to dwellings with basements and to septic tank absorption fields.

If this soil is used for corn, soybeans, or small grain, erosion is a hazard and tilth is a problem. Soil loss can be kept within tolerable limits by a crop rotation that includes 1 or more years of forage crops, by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, by terraces, or by a combination of these. Returning crop residue to the soil and regularly adding other organic material help to maintain productivity, prevent crusting, and improve tilth.

Adapted forage and hay plants grow well on this soil. Timely deferment of grazing helps to prevent overgrazing and thus a greater susceptibility to erosion and soil blowing. The plants should not be grazed until they are sufficiently established. Applications of fertilizer are needed.

If this soil is used as a site for dwellings without basements, the shrink-swell potential is a limitation. Reinforcing the foundation or extending it below the subsoil helps to overcome this limitation.

The land capability classification is IIIe.

588—Sparta loamy sand, loamy substratum. This nearly level, excessively drained soil is on low terraces in river valleys. Individual areas are irregular in shape and range from 5 to 100 acres in size.

Typically, the surface soil is very dark grayish brown and dark brown, very friable loamy sand about 18 inches thick. The subsoil is about 15 inches thick. It is brown, very friable loamy sand in the upper part, and dark yellowish brown, loose sand in the lower part. The upper part of the underlying material is dark yellowish brown, loose sand. The lower part to a depth of 60 inches is dark yellowish brown and brown, mottled, stratified, friable sandy loam and firm clay loam. In some areas the dark surface soil is less than 10 inches thick. In other areas the depth to loamy material is more than 60 inches.

Included with this soil in mapping are small areas of the poorly drained Orio soils in depressions. These soils make up less than 5 percent of the unit.

Water and air move through the upper part of the Sparta soil at a rapid rate and through the lower part at a moderate rate. Surface runoff is slow. The available water capacity is low. Organic matter content is moderately low. Reaction is medium acid in the subsoil. It is neutral in the surface layer as a result of local liming practices.

Most areas are cultivated. This soil is moderately suited to cultivated crops. It is well suited to dwellings but is poorly suited to septic tank absorption fields.

If this soil is used for corn, soybeans, or small grain, droughtiness and low fertility are limitations. Also, soil blowing is a hazard. Irrigation can supply the moisture needed for crops. Frequent applications of a small amount of fertilizer are needed. One application of a large amount can result in excessive loss of plant nutrients through leaching. Applying a system of conservation tillage that leaves crop residue on the surface after planting, returning crop residue to the soil, and regularly adding other organic material help to maintain productivity, conserve moisture, and help to control soil blowing.

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 from septic tanks. The poor filtering capacity can result in the pollution of ground water. Filling or mounding with suitable material increases the filtering capacity of the field.

The land capability classification is IIIs.

682A—Medway loam, 0 to 3 percent slopes. This nearly level, moderately well drained soil is on bottom land and low terraces. It is protected by levees but is still subject to rare flooding. Individual areas are irregular in shape and range from 3 to 250 acres in size.

Typically, the surface soil is very dark gray and very dark grayish brown, friable loam about 16 inches thick. The subsoil is mottled, friable loam about 24 inches thick. The upper part is brown, and the lower part is dark yellowish brown. The upper part of the underlying material is dark yellowish brown, mottled, friable sandy loam. The lower part to a depth of 60 inches is grayish brown, mottled, firm silty clay loam. In some areas the subsoil has a higher content of clay. In other areas the depth to a seasonal high water table is less than 1.5 feet. In places the soil has a higher content of sand.

Included with this soil in mapping are small areas of the excessively drained, droughty Dickinson and Sparta soils. These soils are in the higher, more sloping areas. They make up 10 to 15 percent of the unit.

Water and air move through the Medway soil at a moderate rate. Surface runoff is slow. A seasonal high water table is 1.5 to 3.0 feet below the surface during the winter and spring. The available water capacity is high. Organic matter content is moderate. Reaction is slightly acid or neutral in the subsoil and slightly acid in the surface soil. The potential for frost action is high.

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

No major limitations affect the use of this soil for corn, soybeans, or small grain. The seasonal high water table can delay planting in some years. Subsurface tile drains function satisfactorily if suitable outlets are available. A conservation tillage system that leaves crop residue on the surface after planting helps to maintain tilth and fertility.

The land capability classification is I.

864—Pits, quarry. This map unit consists of excavations and spoil piles in areas where limestone has been mined for use in road construction, for use as ground lime, and for other agricultural and industrial purposes. The quarries consist mainly of nearly level and gently sloping basins and nearly vertical sidewalls.

Individual areas are mainly rectangular and range from 20 to 60 acres in size.

The basins and sidewalls are mainly exposed limestone bedrock. Strips of Bloomfield, Fayette, and Hamburg soils are generally along the rim of the sidewalls. A talus slope is along the basin in places. Included in mapping are roads used in hauling the quarried material, stockpiles of crushed limestone, and spoil material that supports a sparse cover of vegetation.

This map unit is poorly suited to most uses. Areas no longer used for mining can be used as recreation areas and wildlife habitat. Plants generally do not grow well because the spoil material is shallow and rocky. The feasibility of reclamation depends on the conditions at the site and the desired alternative use.

This map unit is not assigned a land capability classification.

915D2—Elco-Ursa silt loams, 10 to 15 percent slopes, eroded. These strongly sloping soils are on side slopes in the uplands. The moderately well drained Elco soil is on the upper part of the slopes, and the well drained Ursa soil is on the lower part. Individual areas are long and irregular in shape and range from 5 to 30 acres in size. They are 45 to 60 percent Elco soil and 25 to 40 percent Ursa soil. The two soils occur as areas so small that separating them in mapping is not practical.

Typically, the surface layer of the Elco soil is dark yellowish brown, friable silt loam about 4 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part is dark yellowish brown, firm silty clay loam. The lower part is light gray and light grayish brown, mottled, firm silty clay loam and clay loam. In some areas the lower part of the soil has a lower content of sand. In other areas the upper part of the soil has a higher content of sand.

Typically, the surface layer of the Ursa soil is brown, friable silt loam about 6 inches thick. The subsoil extends to a depth of about 60 inches. The upper part is dark yellowish brown, friable silty clay loam; the next part is dark yellowish brown, mottled, firm silty clay; and the lower part is gray and light brownish gray, mottled, firm silty clay and clay loam. In some areas the upper part of the soil has a lower content of sand and a higher content of clay. In other areas the soil has a higher content of gravel and a lower content of clay throughout.

Included with these soils in mapping are small areas of very slowly permeable soils on the lower part of the slopes. These included soils make up 5 to 10 percent of the unit.

Water and air move through the the upper part of the Elco soil at a moderate rate and through the lower part at a moderately slow rate. They move through the Ursa soil at a slow rate. Surface runoff is medium on both soils. The Elco soil has a perched water table 2.5 to 4.5 feet below the surface during the spring. The available water capacity is high in both soils. Organic matter content is moderately low. Reaction is slightly acid or neutral in the subsoil of the Elco soil and is neutral in the subsoil of the Ursa soil. It is slightly acid or neutral in the surface layer of both soils. The shrink-swell potential is moderate in the Elco soil and high in the Ursa soil. The potential for frost action is high in the Elco soil and moderate in the Ursa soil.

Most areas are used for pasture. The Elco soil is moderately suited to cultivated crops and to pasture and hay. It is well suited to woodland, moderately suited to dwellings without basements, and poorly suited to dwellings with basements and to septic tank absorption fields. The Ursa soil is poorly suited to cultivated crops and moderately suited to pasture and hay and to woodland. It is generally unsuited to dwellings and septic tank absorption fields because of the shrink-swell potential, the slow permeability, and the slope.

In the areas used for corn, soybeans, or small grain, further erosion is a hazard. A crop rotation dominated by forage crops and a combination of contour farming and a conservation tillage system that leaves crop residue on the surface after planting help to keep soil loss within tolerable limits. Stripcropping also helps to control erosion. Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and productivity.

Adapted forage and hay crops grow well on these soils. Timely deferment of grazing helps to prevent overgrazing and thus also helps to prevent surface compaction, excessive runoff, and a greater susceptibility to erosion. Tilling on the contour when a seedbed is prepared or the pasture is renovated helps to control erosion. Applications of fertilizer are needed. The plants should not be grazed or clipped until they are sufficiently established.

If these soils are used as woodland, plant competition is a management concern. It affects the seedlings of desirable species. The competition in openings where timber has been harvested 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. Measures that protect the woodland from fire are needed.

If the Elco soil is used as a site for dwellings without basements, the seasonal high water table, the shrink-swell potential, and the slope are limitations. Installing subsurface tile drains near the foundations lowers the water table. Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling. Cutting, filling, and land shaping help to overcome the slope.

The seasonal high water table, the moderately slow permeability, and the slope are limitations if the Elco soil is used as a site for septic tank absorption fields. Installing subsurface tile drains higher on the side slopes than the absorption field helps to intercept seepage water. Increasing the size of the filter field or replacing the soil with more permeable material helps to overcome the moderately slow permeability. Installing the filter lines on the contour or cutting and filling help to overcome the slope.

The land capability classification is IVe.

915E2—Elco-Ursa silt loams, 15 to 30 percent slopes, eroded. These moderately steep soils are on side slopes in the uplands. The moderately well drained Elco soil is on the slightly less sloping, upper part of the slopes, and the well drained Ursa soil is on the lower part. Individual areas are long and irregular in shape and range from 5 to 175 acres in size. They are 45 to 60 percent Elco soil and 25 to 40 percent Ursa soil. The two soils occur as areas so small that separating them in mapping is not practical.

Typically, the surface layer of the Elco soil is dark brown and yellowish brown, friable silt loam about 6 inches thick. The subsurface layer is yellowish brown, friable silt loam about 5 inches thick. The subsoil extends to a depth of more than 60 inches. It is yellowish brown. The upper part is friable silt loam, and the lower part is mottled, firm silty clay loam. In some areas the subsoil has a higher content of clay. In other areas the upper part of the subsoil has a higher content of sand and gravel.

Typically, the surface layer of the Ursa soil is brown, friable silt loam about 6 inches thick. The subsoil extends to a depth of about 60 inches. The upper part is yellowish brown, firm silty clay; the next part is yellowish brown, mottled, firm silty clay; and the lower part is gray, mottled, firm clay loam. In some areas the subsoil has a higher content of gravel and a lower content of clay.

Included with these soils in mapping are small areas of very slowly permeable soils on the lower part of the slopes and areas of exposed shale and limestone bedrock along the base of the slopes and in streambeds (fig. 10). Included areas make up 10 to 15 percent of the unit.

Water and air move through the upper part of the Elco soil at a moderate rate and through the lower part at a moderately slow rate. They move through the Ursa soil at a slow rate. Surface runoff is rapid on both soils. The Elco soil has a perched water table 2.5 to 4.5 feet below the surface during the spring. The available water capacity is high in both soils. Organic matter content is moderately low. Reaction is strongly acid or medium acid in the subsoil of the Elco soil and is very strongly acid to mildly alkaline in the subsoil of the Ursa soil. It is medium acid or slightly acid in the surface layer of both soils. The shrink-swell potential is moderate in the Elco soil and high in the Ursa soil. The potential for frost action is high in the Elco soil and moderate in the Ursa soil.

Most areas are used for pasture. Some are wooded. The Elco soil is moderately suited to pasture and hay and well suited to woodland. The Ursa soil is poorly suited to pasture and hay and to woodland. Both soils are generally unsuited to dwellings and septic tank absorption fields because of the slope.

Erosion control is needed when grasses and legumes are becoming established in the pastured areas. In areas where the pasture is established, seeding legumes on the contour improves forage quality and helps to control erosion. A permanent cover of pasture plants helps to control erosion and maintains tilth. Selection of suitable species for planting, proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture and the soil in good condition.

If these soils are used as woodland, the erosion hazard, the equipment limitation, seedling mortality, and plant competition are management concerns. Logging roads and skid trails should be established on the contour if possible. On the steeper slopes, the logs or trees should be skidded uphill with a cable and winch. Firebreaks should be the grass type. Bare logging areas should be seeded to grass or to a grass-legume mixture. Machinery should be used only when the soil is firm enough to support the equipment. The seedling mortality rate can be reduced by eliminating all competing vegetation near the seedlings and by selecting the larger seedlings for planting. 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.

962D3—Sylvan-Bold complex, 10 to 15 percent slopes, severely eroded. These strongly sloping, well drained soils are on side slopes in the uplands. The Sylvan soil is on the upper part of the slopes, and the Bold soil is on the lower part. Individual areas are long and irregular in shape and range from 3 to 50 acres in size. They are 45 to 75 percent Sylvan soil and 20 to 50 percent Bold soil. The two soils occur as areas so small that separating them in mapping is not practical.

Typically, the surface layer of the Sylvan soil is exposed subsoil material. It is dark yellowish brown, friable silty clay loam about 5 inches thick. The subsoil is about 16 inches thick. It is dark yellowish brown. It is firm silty clay loam in the upper part and friable silt loam in the lower part. The underlying material to a depth of 60 inches is light olive brown and yellowish brown, mottled, friable, calcareous silt loam. In some areas the soil is not calcareous within a depth of 40 inches.

Typically, the surface layer of the Bold soil is yellowish brown and dark yellowish brown, friable silt loam about 5 inches thick. The underlying material to a depth of 60 inches is friable, calcareous silt loam. The upper part is yellowish brown and pale brown, the next part is brown

Figure 10.—Outcrops of shale and limestone along the base of slopes and in a streambed included in an area of Elco-Ursa silt loams, 15 to 30 percent slopes, eroded.

and yellowish brown, and the lower part is pale brown and yellowish brown.

Water and air move through both soils at a moderate rate. Surface runoff is medium. The available water capacity is very high. Organic matter content is low. Reaction is mildly alkaline in the subsoil and surface layer of the Sylvan soil and moderately alkaline throughout the Bold soil. The shrink-swell potential is moderate in the Sylvan soil. The potential for frost action is high in both soils. The surface layer of the Sylvan soil tends to crust after hard rains and becomes compact and cloddy if it is tilled when too wet.

Most areas are cultivated. Some are used for pasture. The Sylvan soil is poorly suited to cultivated crops. It is well suited to pasture and hay and to woodland. The Bold soil is generally unsuited to cultivated crops because of low fertility and is moderately suited to pasture and hay. Both soils are moderately suited to dwellings and septic tank absorption fields.

Unless the surface is protected, further erosion is a severe hazard in the areas used for corn, soybeans, or small grain. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, contour farming, terraces, and a crop rotation that is dominated by forage crops. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and help to maintain tilth.

Establishing pasture and hay crops helps to keep soil loss within tolerable limits. Seedbed preparation is difficult on severely eroded side slopes where the subsoil is exposed. A no-till method of pasture renovation or seeding helps to control further erosion. The plants should not be grazed until they are sufficiently established. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to prevent surface compaction and excessive runoff.

If the Sylvan soil is used as woodland, plant competition is a management concern. It affects the seedlings of desirable species. The competition in openings where timber has been harvested 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. Measures that protect the woodland from fire are needed.

If these soils are used as sites for dwellings, the slope is a limitation. On sites for dwellings without basements, the shrink-swell potential of the Sylvan soil also is a limitation. Cutting, filling, and land shaping help to overcome the slope. Reinforcing the foundation or extending it below the subsoil help to overcome the shrink-swell potential.

The slope is a limitation if these soils are used as sites for septic tank absorption fields. Installing the filter lines on the contour or cutting and land shaping help to overcome this limitation.

The land capability classification is IVe.

962E2—Bold-Sylvan silt loams, 15 to 35 percent slopes, eroded. These steep, well drained soils are on side slopes in the uplands. The Bold soil is on the lower part of the slopes, and the Sylvan soil is on the upper part. Individual areas are long and irregular in shape and range from 5 to 200 acres in size. They are 40 to 70 percent Bold soil and 20 to 50 percent Sylvan soil. The two soils occur as areas so small that separating them in mapping is not practical.

Typically, the surface layer of the Bold soil is dark brown, friable silt loam about 7 inches thick. The subsurface layer is yellowish brown, friable silt loam about 4 inches thick. The underlying material to a depth of 60 inches is friable, calcareous silt loam. The upper part is yellowish brown, and the lower part is light brownish gray and yellowish brown and is mottled. In some areas the dark surface layer is thicker.

Typically, the surface layer of the Sylvan soil is dark brown, friable silt loam about 4 inches thick. The subsoil is about 19 inches thick. The upper part is dark yellowish brown, friable silty clay loam, and the lower part is yellowish brown, mottled, friable silt loam. The underlying material to a depth of 60 inches is yellowish brown and light brownish gray, mottled, friable, calcareous silt loam. In some areas the soil is not calcareous within a depth of 40 inches.

Water and air move through both soils at a moderate rate. Surface runoff is rapid. The available water capacity is very high. Organic matter content is low in the Bold soil and moderately low in the Sylvan soil. Reaction is moderately alkaline throughout the Bold soil and neutral in the subsoil and surface layer of the Sylvan soil. The shrink-swell potential is moderate in the Sylvan soil. The potential for frost action is high in both soils.

Most areas are used for pasture. A few are cultivated. Others are wooded. These soils are moderately suited to pasture and hay. The Sylvan soil is well suited to woodland, but the Bold soil is generally unsuited because of a high content of calcium carbonates. Both soils are generally unsuited to cultivated crops and to dwellings and septic tank absorption fields because of the slope.

Erosion control is needed when grasses and legumes are becoming established in the pastured areas. In areas where the pasture is established, seeding legumes on the contour improves forage quality and helps to control erosion. A permanent cover of pasture plants helps to control erosion and maintains tilth. Operating machinery is difficult on the steeper slopes. Selection of suitable species for planting, proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture and the soil in good condition.

If the Sylvan soil is used as woodland, the erosion hazard, the equipment limitation, seedling mortality, and plant competition are management concerns. Logging roads and skid trails should be established on the contour if possible. On the steeper slopes, the logs or trees should be skidded uphill with a cable and winch. Firebreaks should be the grass type. Bare logging areas should be seeded to grass or to a grass-legume mixture. Machinery should be used only when the soil is firm enough to support the equipment. The seedling mortality rate can be reduced by eliminating all competing vegetation near the seedlings and by selecting the larger seedlings for planting. 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 VIe.

962E3—Bold-Sylvan complex, 15 to 35 percent slopes, severely eroded. These steep, well drained soils are on side slopes in the uplands. The Bold soil is on the lower part of the slopes, and the Sylvan soil is on the upper part. Individual areas are long and irregular in shape and range from 3 to 200 acres in size. They are 40 to 70 percent Bold soil and 20 to 50 percent Sylvan soil. The two soils occur as areas so small that separating them in mapping is not practical.

Typically, the surface layer of the Bold soil is dark yellowish brown, friable silt loam about 5 inches thick. The underlying material to a depth of 60 inches is mottled, friable, calcareous silt loam. The upper part is yellowish brown, the next part is light brownish gray, and the lower part is pale brown. In some areas the surface layer is darker.

Typically, the surface layer of the Sylvan soil is exposed subsoil material. It is dark yellowish brown and yellowish brown, friable silty clay loam about 5 inches thick. The subsoil is yellowish brown, firm silty clay loam about 28 inches thick. The underlying material to a depth of 60 inches is pale brown and light brownish gray, mottled, friable, calcareous silt loam. In some areas the soil is not calcareous within a depth of 40 inches.

Water and air move through both soils at a moderate rate. Surface runoff is rapid. The available water capacity is very high. Organic matter content is low. Reaction is moderately alkaline throughout the Bold soil and medium acid in the subsoil and surface layer of the Sylvan soil. The shrink-swell potential is moderate in the Sylvan soil. The potential for frost action is high in both soils.

Most areas are used for pasture. Some small areas are used for cultivated crops. These soils are moderately suited to pasture and hay. The Sylvan soil is well suited to woodland, but the Bold soil is generally unsuited because of a high content of calcium carbonates. Both soils are generally unsuited to cultivated crops and to dwellings and septic tank absorption fields because of the slope.

Erosion control is needed when grasses and legumes are becoming established in the pastured areas. In areas where the pasture is established, seeding legumes on the contour improves forage quality and helps to control erosion. A permanent cover of pasture plants helps to control erosion and maintains tilth. Operating machinery is difficult on the steeper slopes. Selection of suitable species for planting, proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture and the soil in good condition.

If the Sylvan soil is used as woodland, the erosion hazard, the equipment limitation, seedling mortality, and plant competition are management concerns. Logging roads and skid trails should be established on the contour if possible. On the steeper slopes, the logs or trees should be skidded uphill with a cable and winch. Firebreaks should be the grass type. Bare logging areas should be seeded to grass or to a grass-legume mixture. Machinery should be used only when the soil is firm enough to support the equipment. The seedling mortality rate can be reduced by eliminating all competing vegetation near the seedlings and by selecting the larger seedlings for planting. 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 VIe.

2036B—Tama-Urban land complex, 2 to 5 percent slopes. This gently sloping map unit occurs as areas of a moderately well drained Tama soil intermingled with areas of Urban land. It is on upland ridges and side slopes. Individual areas range from 3 to 700 acres in size. They are 40 to 55 percent Tama soil and 35 to 45 percent Urban land. The Tama soil and Urban land occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the surface soil of the Tama soil is very dark grayish brown, friable silt loam about 18 inches thick. The subsoil is about 28 inches thick. The upper part is brown and yellowish brown, friable silt loam. The next part is yellowish brown, mottled, firm silty clay loam. The lower part is yellowish brown, mottled, friable silt loam. The underlying material to a depth of 60 inches is yellowish brown and pale brown, mottled, friable silt loam. In some areas the surface layer contains cinders, concrete, or brick. In other areas the depth to a seasonal high water table is less than 4 feet.

The Urban land is covered by streets, parking lots, buildings, and other structures. The soils in these areas are so obscured or modified that the soil series cannot be identified.

Included with the Tama soil in mapping are small areas of the poorly drained Sable soils in slight depressions and shallow drainageways. These soils make up 5 to 10 percent of the unit.

Water and air move through the Tama soil at a moderate rate. Surface runoff is medium on the Tama soil and rapid on the Urban land. A seasonal high water table is 4 to 6 feet below the surface of the Tama soil during the spring. The available water capacity is very high in this soil. Organic matter content is moderate. Reaction is strongly acid or medium acid in the subsoil and strongly acid in the surface layer. The shrink-swell potential is moderate, and the potential for frost action is high.

The Tama soil is used for parks, golf fairways, building sites, lawns, and gardens. It is well suited to lawns, vegetable and flower gardens, and ornamental trees and shrubs because the available water capacity is high and the surface layer is friable and can be easily tilled throughout a wide range in moisture content. The soil also is well suited to recreational uses. It is moderately suited to dwellings and septic tank absorption fields. It is poorly suited to local roads and streets. Erosion is a hazard on construction sites if the surface is bare for considerable periods.

If the Tama soil is used as a site for dwellings with basements, the seasonal high water table and the shrink-swell potential are limitations. The shrink-swell potential also is a limitation on sites for dwellings without basements. Installing subsurface tile drains near the foundations helps to overcome the wetness. Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

The seasonal high water table is a limitation if the Tama soil is used as a site for septic tank absorption fields. Subsurface tile drains lower the water table. Where available, municipal sewers should be used.

Low strength and the potential for frost action are limitations if the Tama soil is used as a site for local roads and streets. Strengthening or replacing the subgrade material helps to prevent the damage caused by low strength and frost action. Installing a drainage system and then grading the roads so that they shed water reduce the wetness and thus help to prevent the damage caused by frost action.

This map unit is not assigned a land capability classification.

2036C—Tama-Urban land complex, 5 to 10 percent slopes. This moderately sloping map unit occurs as areas of a moderately well drained Tama soil intermingled with areas of Urban land. It is on upland ridges and side slopes. Individual areas range from 5 to 400 acres in size. They are 40 to 55 percent Tama soil and 35 to 45 percent Urban land. The Tama soil and Urban land occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the surface layer of the Tama soil is very dark grayish brown and dark brown, friable silt loam about 10 inches thick. The subsoil to a depth of 60 inches is friable silty clay loam. The upper part is dark brown, the next part is brown, and the lower part is dark yellowish brown and mottled. In some places the surface layer is mixed with cinders, concrete, or bricks. In other places the surface layer is lighter in color. Some areas have been cut, filled, and leveled, so that the altered landscape is less sloping than is typical.

The Urban land is covered by streets, parking lots, buildings, and other structures. The soils in these areas are so obscured or modified that the soil series cannot be identified.

Included with the Tama soil in mapping are small areas of the somewhat poorly drained Ipava soils on the less sloping, lower parts of the landscape. These soils make up 5 to 10 percent of the unit.

Water and air move through the Tama soil at a moderate rate. Surface runoff is medium on the Tama soil and rapid on the Urban land. A seasonal high water table is 4 to 6 feet below the surface of the Tama soil during the spring. The available water capacity is very high in this soil. Organic matter content is moderate. Reaction is strongly acid in the surface layer and strongly acid to slightly acid in the subsoil. The shrink-swell potential is moderate, and the potential for frost action is high.

The Tama soil is used for parks, golf fairways, building sites, lawns, and gardens. It is moderately suited to lawns, vegetable and flower gardens, most recreational uses, dwellings, and septic tank absorption fields. It is poorly suited to local roads and streets. Erosion is a hazard on construction sites if the surface is bare for considerable periods.

If the Tama soil is used as a site for dwellings with basements, the seasonal high water table, the slope, and the shrink-swell potential are limitations. The shrink-swell potential and the slope also are limitations on sites for dwellings without basements. Installing subsurface tile drains near the foundations helps to overcome the wetness. Cutting, filling, and land shaping help to overcome the slope. Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If the Tama soil is used as a site for septic tank absorption fields, the seasonal high water table and the slope are limitations. Subsurface tile drains lower the water table. Installing the filter lines on the contour or cutting and land shaping help to overcome the slope. Where available, municipal sewers should be used.

Low strength and the potential for frost action are limitations if the Tama soil is used as a site for local roads and streets. Strengthening or replacing the subgrade material helps to prevent the damage caused by low strength and frost action. Installing a drainage system and then grading the roads so that they shed water reduce the wetness and thus help to prevent the damage caused by frost action.

This map unit is not assigned a land capability classification.

2043A—Ipava-Urban land complex, 0 to 3 percent slopes. This nearly level map unit occurs as areas of a somewhat poorly drained Ipava soil intermingled with areas of Urban land. It is on slight rises and ridges in the uplands. Individual areas range from 20 to more than 800 acres in size. They are 40 to 55 percent Ipava soil and 35 to 45 percent Urban land. The Ipava soil and Urban land occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the surface layer of the Ipava soil is very dark gray, friable silt loam about 10 inches thick. The subsurface layer is black, friable silt loam about 11 inches thick. The subsoil is about 23 inches thick. The upper part is yellowish brown, mottled, firm silty clay loam, and the lower part is dark yellowish brown and pale brown, mottled, friable silt loam. The underlying material to a depth of 60 inches is pale brown, mottled, friable silt loam. In some areas the depth to a seasonal high water table is more than 3 feet. In other areas the surface layer is mixed with cinders, concrete, or brick.

The Urban land is covered by streets, parking lots, buildings, and other structures. The soils in these areas are so obscured or modified that the soil series cannot be identified.

Included with the Ipava soil in mapping are small areas of the poorly drained Sable soils. These soils are in slight depressions and drainageways below the Ipava soil. They make up 5 to 10 percent of the unit.

Water and air move through the Ipava soil at a moderately slow rate. Surface runoff is slow on the Ipava soil and rapid on the Urban land. A seasonal high water table is 1 to 3 feet below the surface of the Ipava soil during the spring. The available water capacity is high in this soil. Organic matter content also is high. Reaction is medium acid in the surface layer and medium acid or slightly acid in the subsoil. The shrink-swell potential and the potential for frost action are high.

The Ipava soil is used for parks, building sites, lawns, and gardens. It is moderately well suited to lawns, vegetable and flower gardens, and ornamental trees and shrubs. It is poorly suited to recreational uses, dwellings, septic tank absorption fields, and local roads and streets. Erosion is a hazard on construction sites if the surface is bare for considerable periods.

If the Ipava soil is used as a site for dwellings, the seasonal high water table and the shrink-swell potential are limitations. Installing subsurface tile drains near the foundations helps to overcome the wetness. Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If the Ipava soil is used as a site for septic tank absorption fields, the seasonal high water table and the moderately slow permeability are limitations. Subsurface tile drains lower the water table. Grading and land shaping help to remove surface water. Increasing the size of the filter field or replacing the soil with more permeable material helps to overcome the moderately slow permeability. Where available, municipal sewers should be used.

Low strength, the potential for frost action, and the shrink-swell potential are limitations if the Ipava 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 then grading the roads so that they shed water reduce the wetness and thus help to prevent the damage caused by frost action.

This map unit is not assigned a land capability classification.

2244—Hartsburg-Urban land complex. This nearly level map unit occurs as areas of a poorly drained Hartsburg soil intermingled with areas of Urban land. It is on low upland flats and in drainageways that are occasionally ponded for brief periods. Individual areas are 45 to 60 percent Hartsburg soil and 25 to 40 percent Urban land. The Hartsburg soil and Urban land occur as areas so intricately mixed or so small that mapping them separately is not practical.

Typically, the surface soil of the Hartsburg soil is black, firm silty clay loam about 14 inches thick. The subsoil is about 26 inches thick. The upper part is very dark grayish brown, mottled, firm silty clay loam; the next part is grayish brown, mottled, firm silty clay loam; and the lower part is light brownish gray, mottled, friable, calcareous silt loam. The underlying material to a depth of 60 inches is light brownish gray, mottled, friable, calcareous silt loam. In some areas the surface layer is mixed with cinders, concrete, or brick. In other areas the soil is not calcareous within a depth of 40 inches.

The Urban land is covered by streets, parking lots, buildings, and other structures. The soils in these areas are so obscured that the soil series cannot be identified.

Included with the Hartsburg soil in mapping are small areas of the somewhat poorly drained Ipava soils, which are not subject to ponding. Also included are areas that have been built up or filled, so that the altered landscape is more sloping and is not subject to ponding. Included areas make up 10 to 15 percent of the unit.

Water and air move through the Hartsburg soil at a moderate rate. Surface runoff is slow or ponded on the Hartsburg soil and slow on the Urban land. Excess water is drained through storm sewers, gutters, drainage tile, and, to a lesser extent, surface ditches. Unless drained, the Hartsburg soil has a seasonal high water table that ranges from 0.5 foot above the surface to 2.0 feet below during the spring. The available water capacity is high in this soil. Organic matter content also is high in this soil. Reaction is slightly acid in the surface layer and neutral to moderately alkaline in the subsoil. The shrink-swell potential is moderate, and the potential for frost action is high.

The Hartsburg soil is used for parks, building site development, lawns, and gardens. It 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, vegetable and flower gardens, ornamental trees and shrubs, and recreational uses. Lowering the water table with underground drains and installing surface drains help to overcome this limitation.

If the Hartsburg soil is used as a site for dwellings, the ponding is a hazard, and the shrink-swell potential is a limitation. The hazard of ponding can be reduced by diverting surface water or constructing the building on raised fill material. Subsurface tile drains and surface inlet tile drains help to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

The seasonal high water table and the moderate permeability are limitations if the Hartsburg soil is used as a site for septic tank absorption fields. Subsurface tile drains lower the water table. Grading and land shaping help to remove excess surface water. Increasing the size of the filter field or replacing the soil with more permeable material helps to overcome the moderate permeability. Where available, municipal sewers should be used.

If the Hartsburg soil is used as a site for local roads and streets, low strength, the potential for frost action, and the shrink-swell potential are limitations. Also, the ponding is a hazard. Providing suitable subgrade material helps to prevent the damage caused by low strength, frost action, and shrinking and swelling. Installing a drainage system and then grading the roads so that they shed water help to prevent the damage caused by ponding and frost action.

This map unit is not assigned a land capability classification.

3070—Beaucoup silty clay loam, frequently flooded. This nearly level, poorly drained soil is on broad bottom land. It is subject to ponding and is frequently flooded for long periods in the spring. Individual areas are irregular in shape and range from 20 to 500 acres in size.

Typically, the surface layer is black, firm silty clay loam about 10 inches thick. The subsurface layer is dark grayish brown, mottled, firm silty clay loam about 9 inches thick. The subsoil is mottled, firm silty clay loam about 30 inches thick. The upper part is dark grayish brown, and the lower part is grayish brown. The underlying material to a depth of 60 inches is grayish brown, mottled, friable silt loam. In some areas the soil has a higher content of clay. In other areas it is stratified with silty and loamy material.

Included with this soil in mapping are small areas of the very slowly permeable Darwin soils in the lower landscape positions. Also included are sandy soils on small ridges and along the edge of small lakes or other bodies of water. Included soils make up 10 to 15 percent of the unit.

Water and air move through the Beaucoup soil at a moderately slow rate. Surface runoff is slow to ponded. A seasonal high water table ranges from 0.5 foot above the surface to 2.0 feet below during the spring. The available water capacity is high. Organic matter content also is high. Reaction is medium acid to neutral in the subsoil and mildly alkaline in the surface layer. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are wooded and are used as wetland wildlife habitat. This soil is well suited to woodland and to wetland wildlife habitat. It is generally unsuited to cultivated crops, dwellings, and septic tank absorption fields because of the flooding.

If this soil is used as woodland, the equipment limitation, seedling mortality, and windthrow are management concerns. They are caused by the wetness. Plant competition also is a concern. It affects the seedlings of desirable species. Machinery should be used only when the soil is firm enough to support the equipment. The seedling mortality rate can be reduced by planting species that can withstand excessive wetness. Harvesting methods that do not isolate the remaining trees or leave them widely spaced reduce the windthrow hazard. Only high-value trees should be removed from a strip 50 feet wide along the west and south edges of the woodland. The plant competition in openings where timber has been harvested 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. Measures that protect the woodland from fire are needed.

This soil provides good habitat for wetland wildlife. Most areas are adjacent to the Illinois River or small lakes, which provide habitat for game fish and a water supply for other wildlife. Also available are grain and seed crops, wild herbaceous plants, wetland plants, and other important habitat elements.

The land capability classification is Vw.

7070—Beaucoup silty clay loam, rarely flooded. This nearly level, poorly drained soil is on broad bottom land. It is protected by levees but is still subject to rare flooding. It also is subject to ponding. Individual areas are irregular in shape and range from 3 to 400 acres in size.

Typically, the surface soil is very dark gray and very dark grayish brown, friable silty clay loam about 12 inches thick. The subsoil is about 34 inches thick. It is mottled. The upper part is dark gray and dark grayish brown, firm silty clay loam. The lower part is grayish brown and light brownish gray, friable silty clay loam and silt loam. The underlying material to a depth of 60 inches is light gray, mottled, friable silt loam. In some areas the soil has a higher content of sand. In other areas the subsoil is calcareous.

Included with this soil in mapping are small areas of the very slowly permeable Darwin soils in the slightly lower landscape positions. These soils make up 5 to 10 percent of the unit.

Water and air move through the Beaucoup soil at a moderately slow rate. Surface runoff is slow to ponded. A seasonal high water table is 0.5 foot above the surface to 2.0 feet below during the spring. The available water capacity is high. Organic matter content also is high. Reaction is neutral in the subsoil and surface layer. The shrink-swell potential is moderate, and the potential for frost action is high. The surface layer becomes compact and cloddy if it is plowed when too wet.

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

If drained, this soil can be used for corn, soybeans, and small grain. A drainage system has been installed in most areas. Measures that maintain or improve the drainage system are needed. Surface drains, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. Land grading helps to control ponding. Applying a conservation tillage system that leaves crop residue on the surface after planting and returning crop residue to the soil improve tilth, help to prevent surface compaction, and increase the rate of water intake.

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.

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 and 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 inputs 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 Soil Conservation Service.

About 318,000 acres in Morgan and Scott Counties, or more than 60 percent of the total acreage, meets the soil requirements for prime farmland. Of the associations described under the heading "General Soil Map Units," associations 1, 2, and 7 have the highest percentage, but the prime farmland is throughout the counties. About 302,000 acres of the prime farmland is used for crops, mainly corn and soybeans. The crops grown on this land account for most of the local agricultural income each year.

A recent trend in land use in some parts of the survey area has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

The map units in Morgan and Scott Counties 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 soils that are frequently flooded during the growing season can qualify for prime farmland only in areas where these limitations have been overcome by such measures as drainage 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 Morgan and Scott Counties, 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 avoid 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 behavior 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 recreation 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

Steve Webber, district conservationist, Soil Conservation Service, helped prepare this section.

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 Soil 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 "Detailed Soil Map Units." Specific information can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

Most of the soils in Morgan and Scott Counties have good potential for crop production, particularly if the latest crop production techniques and management practices are applied to the cropland. This soil survey can greatly facilitate the application of such technology.

In 1978, a total of 279,401 acres in Morgan County was cropland and 57,005 acres was pasture. A total of 109,168 acres in Scott County was cropland and 27,830 acres was pasture (*13*).

The primary crops in Morgan and Scott Counties are corn and soybeans. Wheat is the main close-growing crop. In 1980, corn was grown on about 170,000 acres and soybeans on 114,000 acres. About 24,000 acres was used for wheat and 1,000 acres for oats. Hay was grown on about 8,000 acres (*5*).

Suitable pasture and hay plants include several legumes, cool-season grasses, and warm-season native grasses. Alfalfa and red clover are the main legumes grown for hay. They also are grown in mixtures with smooth bromegrass, orchardgrass, and fescue for hay and pasture. Alsike clover and ladino clover are other legumes included in the pasture mixtures.

Suitable warm-season native grasses are little bluestem, indiangrass, and switchgrass. These grasses grow well during the summer. They require different management techniques for establishment and grazing than cool-season grasses.

Alfalfa is best suited to deep, moderately well drained and well drained soils, such as Fayette, Hickory, Rozetta, and Seaton. Other legumes and grasses grow well on these soils and on somewhat poorly drained soils on uplands. Elco and Keomah are examples of soils that are suited to most pasture and hay plants. On Ambraw, Beaucoup, Sable, Virden, and other poorly drained soils, water-tolerant plants, such as ladino clover and reed canarygrass, should be selected for planting.

Well managed stands of forage are effective in controlling erosion. The need for lime and fertilizer and overgrazing are common management concerns. The amount of lime and fertilizer to be applied should be based on the results of soil tests, the needs of the plants, and the expected level of production.

Overgrazing reduces the productivity of the pasture. It also allows weeds and brush to increase in extent. It can be prevented by measures that maintain fertility, deferred grazing, rotation grazing, and proper stocking rates. Deferred grazing gives the pasture a rest period that allows the forage species to build up carbohydrate reserves. Rotation grazing among several areas of pasture gives each area a rest period. The information in table 6 can be helpful in estimating the number of animals that can be carried in a pasture.

Many soils in the survey area have a high water table in the spring. Where possible, grazing should be avoided when the surface layer is wet. Deferred grazing during wet periods minimizes compaction. Pasture renovation helps to restore areas where compaction has occurred. Frost heaving of alfalfa and red clover is a more serious hazard on the soils that have a high water table than on other soils. This hazard can be reduced by a cover of stubble, 4 to 6 inches high, during winter, and by selection of grass-legume mixtures for planting.

The paragraphs that follow describe the major concerns in managing the cropland and pasture in the survey area. These concerns are water erosion, soil blowing, wetness, droughtiness, fertility, and tilth.

Water erosion is the major management concern on about 60 percent of the cropland and pasture in Morgan County and on about 70 percent of the cropland and pasture in Scott County. Erosion is adequately controlled on about 45 percent of the land in Morgan County and on about 30 percent of the land in Scott County. Soils that have a slope of more than 2 percent are subject to erosion. Some soils that have a slope of less than 2 percent also are subject to erosion, particularly if the slopes are long.

Loss of the surface layer through sheet and rill erosion is damaging for three reasons. First, the organic matter content and natural fertility level are lowered as the surface layer is lost and part of the subsoil is incorporated into the plow layer. As a result, soil productivity is reduced.

Second, severe erosion on sloping soils results in deterioration of tilth in the surface soil and reduces the rate of water intake. A surface layer of silty clay loam or clay loam tends to become cloddy if tilled when too wet. Because of the cloddiness, preparing a good seedbed is difficult. Also, a surface crust tends to form after hard rains. The crusting increases the runoff rate.

Third, soil erosion on farmland results in sedimentation in streams, rivers, ponds, and road ditches. Control of this pollution improves the quality of the water available for municipal use, for recreation, and for fish and wildlife.

A cropping system that keeps plants or crop residue on the surface for extended periods helps to control erosion and maintain the productive capacity of the soil. Including grasses and legumes in the cropping sequence minimizes crusting, improves tilth, and provides nitrogen for the following crop.

Conservation tillage, terraces, diversions, contour farming, and a cropping system that rotates grasses or close-growing crops with row crops help to control erosion. A system of conservation tillage that leaves crop residue on the surface after planting is being applied on an increasing acreage in Morgan and Scott Counties. Examples of conservation tillage are chisel plowing and no-till planting. These systems can be used on most of the soils in the survey area. They are effective in reducing the hazard of erosion, maintaining or developing good soil structure, minimizing compaction, and improving soil aeration, water infiltration, and tilth.

Terraces and diversions reduce the length of slopes, thereby reducing the risks of runoff and erosion. They intercept runoff and carry it at a nonerosive velocity to a stable outlet. Terraces are most practical on well drained soils that have long, uniform slopes, such as Fayette soils. Contour farming is best suited to soils that have smooth, uniform slopes of 2 to 7 percent. Rozetta and Tama soils are examples.

Crop rotations that include small grain, grasses, and legumes are needed to control erosion on moderately sloping and strongly sloping soils, such as Elco and Sylvan soils. In addition to reducing soil loss, these rotations increase the content of organic matter, the level of nitrogen in the soil, and the available water capacity and improve tilth. Also, they can reduce the number of crop-damaging weeds and insects on and in the soil by annually changing the soil environment.

Soil blowing is a hazard on sandy soils, such as Sparta and Plainfield soils. A protective plant cover, surface mulch, or a system of conservation tillage that leaves crop residue on the surface after planting minimizes soil blowing on these soils. Windbreaks are also effective in controlling soil blowing.

Wetness is a major management concern on about 40 percent of the cropland in Morgan County and on about 30 percent of the cropland in Scott County. The poorly drained soils, such as Hartsburg, Sable, and Virden soils, require some kind of drainage system if they are used for the crops commonly grown in the survey area. In Morgan and Scott Counties, a drainage system has been installed in most areas of these soils. The wetness of Ipava, Keomah, and other somewhat poorly drained soils can delay planting and thus reduce yields in some years. A drainage system has been installed in most areas of these soils. Measures that maintain the drainage system are needed.

Troublesome seepy spots are common in areas of Assumption and Elco soils on side slopes, especially in wet years. A drainage system is needed in these areas.

The design of drainage systems varies with the kind of soil. If properly spaced, tile drains alone generally are sufficient in most upland soils. Soils that are moderately permeable or moderately slowly permeable, such as Ipava, Sable, and Virden soils, can be adequately drained by tile if outlets are available. Field drainage ditches are needed, however, in areas of the slowly permeable and very slowly permeable soils on bottom land, such as Darwin and Wagner soils.

Droughtiness limits the productivity of some soils used for crops and pasture. The coarse texture of some soils limits the amount of water available to plants. Plainfield and Sparta soils are examples. Although the wet, clayey Darwin soils can hold large amounts of water, little of the moisture is readily available to plant roots during periods of moderate to high moisture demand. Most of the water is tightly held in a film surrounding the clay particles.

The adverse effects of droughtiness can be reduced by increasing the available water capacity, reducing runoff and evaporation rates, and planting drought-tolerant crops. Applying a system of conservation tillage, returning crop residue to the soil or adding other organic material, and seeding permanent pastures to suitable grasses and legumes increase the available water capacity and reduce runoff and evaporation rates.

Natural fertility levels in the soils of Morgan and Scott Counties range from low to high. They are low, for example, in Hickory soils and high in Sable soils. Plants on most of the soils in the counties respond well to applications of nitrogen, phosphorus, and potassium fertilizer. The soils range from acid to alkaline in reaction. The acid Keomah and Rozetta soils require applications of ground limestone to raise the pH sufficiently for good crop production. The calcareous Bold soils do not require applications of lime because of their naturally high pH. On all soils the kind and amount of lime and fertilizer to be applied should be based on the results of soil tests, the needs of the crop, and the expected level of yields. The Cooperative Extension Service can help in determining the rate of application after tests are made.

Tilth affects the infiltration of water and the germination of seeds. Most of the soils used for crops in the survey area have a silt loam surface layer and can be tilled throughout a wide range of moisture content. Some of the soils, such as Rozetta and Keomah soils, are lower in content of organic matter than others. Generally, these soils have weak soil structure. A crust forms at their surface during periods of heavy rainfall. The crust is hard when dry and is nearly impervious to water. It decreases the rate of water infiltration and increases the runoff rate. Regular additions of crop residue, manure, and other organic material improve soil structure and minimize crusting. Leaving crop residue on the surface also minimizes crusting.

Poor tilth is a problem in the very poorly drained Darwin and poorly drained Sable and Virden soils. If tilled when too wet, these soils tend to become cloddy. As a result, preparing a good seedbed is difficult. These soils often stay wet until late in spring. This wetness limits the opportunity for primary tillage. If the soils are tilled in the fall, enough crop residue should be left on the surface to prevent excessive soil blowing.

The latest information about growing crops can be obtained from local offices of the Cooperative Extension Service and the Soil Conservation Service.

Yields Per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 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. Available yield data from nearby counties and results of field trials and demonstrations are also considered (*3*).

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 Soil Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

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

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit (*11*). 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 limitation is 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 capability classification of each map unit is given the the section "Detailed Soil Map Units" and in the yields table.

Woodland Management and Productivity

Tom Wilson, district forester, Illinois State Department of Conservation, helped prepare this section.

About 24,965 acres in Morgan County and 14,605 acres in Scott County are used as woodland. Virgin forest once covered most of Scott County and the northwestern and western parts of Morgan County. The trees have been cleared from most of the areas suitable for cultivation. The remaining woodland is in areas that are too steep or remote for farming. The soils in these areas have poor to good potential for woodland. Those having good potential can produce trees of high quality if the woodland is properly managed. Most of the woodland is privately owned. Currently, Morgan County has one sawmill and Scott County two sawmills.

The largest areas of woodland are in soil associations 3 and 4, which are described in the section "General Soil Map Units." The most common trees in the uplands are white oak, black oak, northern red oak, black walnut, and various species of hickory. Other species are sugar maple, ash, black locust, and osageorange. The main species on the bottom land are willow, cottonwood, linden, sycamore, and silver maple.

Table 7 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; and *F*, a high content of rock fragments in the soil. 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, and F.

In table 7, *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, fire lanes, and 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 or season of use is not significantly restricted by soil factors. Soil wetness can restrict equipment use, but the wet period does not exceed 1 month. A rating of *moderate* indicates that equipment use is moderately restricted because of one or more soil factors. If the soil is wet, the wetness restricts equipment use for a period of 1 to 3 months. A rating of *severe* indicates that equipment use is severely restricted either as to the kind of equipment that can be used or the season of use. If the soil is wet, the wetness restricts equipment use for more than 3 months.

Seedling mortality refers to the death of naturally occurring or planted tree seedlings, as influenced by the kinds of soil, soil wetness, or topographic conditions. The factors used in rating the soils for seedling mortality are texture of the surface layer, depth to a seasonal high water table and the length of the period when the water table is high, rock fragments in the surface layer, effective rooting depth, and slope aspect. A rating of *slight* indicates that seedling mortality is not likely to be a problem under normal conditions. Expected mortality is less than 25 percent. A rating of *moderate* indicates that some problems from seedling mortality can be expected. Extra precautions are advisable. Expected mortality is 25 to 50 percent. A rating of *severe* indicates that seedling mortality is a serious problem. Extra precautions are important. Replanting may be necessary. Expected mortality is more than 50 percent.

Windthrow hazard is the likelihood that trees will be uprooted by the wind because the soil is not deep enough for adequate root anchorage. The main restrictions that affect rooting are a seasonal high water table and the depth to bedrock, a fragipan, or other limiting layers. A rating of *slight* indicates that under normal conditions no trees are blown down by the wind. Strong winds may damage trees, but they do not uproot them. A rating of *moderate* indicates that some trees can be blown down during periods when the soil is wet and winds are moderate or strong. A rating of *severe* indicates that many trees can be blown down during these periods.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index* and as a *volume* number. The site index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

The *volume*, a number, is the yield likely to be produced by the most important trees. This number, expressed as cubic feet per acre per year, indicates the amount of fiber produced on 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 is the dominant species on the soil and 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 8 shows the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates in table 8 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 Soil Conservation Service or the Cooperative Extension Service or from a commercial nursery.

Recreation

The soils of the survey area are rated in table 9 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 sewerlines. 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 recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 9, 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 9 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 12 and interpretations for dwellings without basements and for local roads and streets in table 11.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

Stephen Brady, biologist, Soil Conservation Service, helped prepare this section.

The soils in Morgan and Scott Counties provide habitat for a variety of wildlife species, including quail, deer, rabbits, squirrels, and many important nongame species. Morgan County is on the fringe of the range of ring-necked pheasant. Although not numerous, pheasants inhabit principally the northern and eastern parts of the county. Ducks and other waterfowl inhabit the bottom land along the Illinois River and areas along upland streams. Streams and lakes are inhabited by smallmouth bass, largemouth bass, catfish, sunfish, carp, and other fish. Many farm ponds are stocked with largemouth bass, bluegill, and channel catfish.

In most areas in the two counties, wildlife habitat can be improved by providing the food, cover, and water needed by wildlife. In the following paragraphs, the soil associations described in the section "General Soil Map Units" are grouped into three wildlife areas.

Wildlife area 1 consists of the Ipava-Tama-Sable and Ipava-Virden associations. The soils in these associations formed under prairie vegetation. They are nearly level to moderately sloping and are poorly drained to moderately well drained. The chief wildlife species are ring-necked pheasant, raccoon, and nongame animals, such as the horned lark, dickcissel, meadowlark, and other species adapted to prairie or openland habitat.

This wildlife area is mainly cropland, much of which is used for corn or soybeans year after year. Wildlife habitat is generally of poor quality because of a scarcity of crop residue, herbaceous nesting and roosting cover, woody cover, and travel lanes or hedgerows. Measures that can improve or maintain the habitat are delayed mowing of grassy cover on roadsides, ditchbanks, and waterways until after the nesting season; seeding of terrace ridges or back slopes to smooth bromegrass or other desirable grasses; protection of the existing woody cover; establishment of hedgerows and windbreaks; and a system of conservation tillage, which provides crop residue and waste grain for wildlife cover and food throughout the winter.

Wildlife area 2 consists of the Rozetta-Hickory-Elco, Fayette-Sylvan-Bold, and Lawson-Wakeland-Arenzville associations. The soils in these associations are nearly level to very steep and are somewhat poorly drained to well drained. The major game species are white-tailed deer, mourning dove, bobwhite quail, fox, squirrel, and rabbit. Nongame species include horned lark, dickcissel, meadowlark, great horned owl, ground squirrel, and a variety of reptiles and amphibians.

This wildlife area is much more diversified than wildlife area 1. It consists of cropland, pasture, and woodland and includes streams and ponds, which provide favorable habitat for a wide variety of wildlife. Good pasture management, protection of woodland from grazing by livestock, crop residue management, delayed mowing of grassy cover until after the nesting season, and establishment of field and farmstead windbreaks, hedgerows, and brushy fencerows can improve the habitat.

Wildlife area 3 consists of the Darwin-Beaucoup-Ambraw, Worthen-Littleton, and Plainfield-Sparta-Hoopeston associations. The soils in these associations are on the flood plains and low terraces along the Illinois River. They are nearly level to strongly sloping. They either are very poorly drained to well drained or are excessively drained. Some are subject to flooding, but most areas are protected by levees.

This wildlife area is mainly cropland. A few areas are used as woodland. The areas of hardwoods on the bottom land provide good habitat for wood ducks, white-tailed deer, raccoons, and other woodland wildlife. The very poorly drained and poorly drained soils provide wetland habitat for waterfowl, shore birds, muskrat, and mink. The valley along the Illinois River provides habitat for a wide variety of songbirds, shore birds, and waterfowl that migrate in spring and fall.

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 10, 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 flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, timothy, 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 flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, ragweed, and foxtail.

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. The 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, 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.

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. The ratings are given in the following tables: 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 need to 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, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. 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 (1) evaluate the potential of areas for residential, commercial, industrial, and recreation uses; (2) make preliminary estimates of construction conditions; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; (5) plan detailed onsite investigations of soils and geology; (6) locate potential sources of gravel, sand, earthfill, and topsoil; (7) plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and (8) 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 11 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 the 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, shrink-swell potential, 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 to 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 12 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 12 also shows the suitability of the soils for use as daily cover for landfills. 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, and flooding affect absorption of the effluent. Large stones 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 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 12 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 due to rapid permeability of 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 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 needs to be considered.

The ratings in table 12 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 type 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 type 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 the 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 13 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 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, 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 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 the depth to the water table is 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. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. In table 13, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal 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 14 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 potential 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 reduce 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. 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 18.

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 characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classifications, 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 15 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "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.

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

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

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

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

Physical and Chemical Properties

Table 16 shows estimates of some 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, and plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3 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, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

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 change is based on the soil fraction less than 2 millimeters in diameter. 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. Sands, coarse 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 sands, loamy fine sands, and loamy very fine sands. These soils are very highly erodible. Crops can be grown if intensive measures to control soil blowing are used.

3. Sandy loams, coarse 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 loamy soils that are less than 35 percent clay and more than 5 percent finely divided calcium carbonate. These soils are erodible. Crops can be grown if intensive measures to control soil blowing are used.

4. Clays, silty clays, 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. Loamy soils that are less than 20 percent clay and less than 5 percent finely divided calcium carbonate and sandy clay loams and sandy clays that are less than 5 percent finely divided calcium carbonate. These soils are slightly erodible. Crops can be grown if measures to control soil blowing are used.

6. Loamy soils that are 20 to 35 percent clay and less than 5 percent finely divided calcium carbonate, except silty clay loams. These soils are very slightly erodible. Crops can easily be grown.

7. Silty clay loams that are less than 35 percent clay and less than 5 percent finely divided calcium carbonate. These soils are very slightly erodible. Crops can easily be grown.

8. Stony or gravelly soils and other soils not subject to soil blowing.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 16, 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 of 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 17 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the intake 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 17, 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 17 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; *occasional* that it occurs, on the average, once or less in 2 years; and *frequent* that it occurs, on the average, more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; November-May, for example, means that flooding can occur during the period November through May.

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 absence of distinctive horizons that form in soils that are not subject to flooding.

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 depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 17 are the 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 17.

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 creates a severe corrosion environment. 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 18 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 2217 (ASTM); Liquid limit—T 89 (AASHTO), D 423 (ASTM); Plasticity index—T 90 (AASHTO), D 424 (ASTM); and Moisture density, Method A—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 (*12*). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 19 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Ten 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. Mostly 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-silty, 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* (*10*). Many of the technical terms used in the descriptions are defined in *Soil Taxonomy* (*12*). 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 rapidly permeable soils on ridges and side slopes on uplands and terrace breaks. These soils formed in sandy and loamy material. Slopes range from 2 to 15 percent.

Alvin soils are similar to Onarga soils and commonly are adjacent to Bloomfield soils. Onarga soils have a mollic epipedon. Bloomfield soils are on dunelike ridges and side slopes above the Alvin soils. Their subsoil has less clay than that of the Alvin soils and has lamellae.

Typical pedon of Alvin fine sandy loam, 7 to 15 percent slopes, 1,420 feet east and 840 feet north of the southwest corner of sec. 26, T. 14 N., R. 13 W.

A—0 to 6 inches; brown (10YR 4/3) fine sandy loam, pale brown (10YR 6/3) dry; weak fine and medium granular structure; very friable; many very fine roots; common faint dark brown (10YR 3/3) organic coatings on faces of peds; medium acid; abrupt smooth boundary.

E—6 to 12 inches; dark yellowish brown (10YR 4/4) fine sandy loam, pale brown (10YR 6/3) dry; weak fine granular structure; very friable; many very fine roots; medium acid; clear smooth boundary.

BE—12 to 20 inches; brown (7.5YR 4/4) fine sandy loam; weak fine subangular blocky structure; friable; many very fine roots; medium acid; clear smooth boundary.

Bt—20 to 36 inches; strong brown (7.5YR 5/6) fine sandy loam; moderate medium and fine subangular blocky structure; friable; many very fine roots; many distinct brown (7.5YR 4/4) clay films on faces of peds; strongly acid; clear smooth boundary.

BC—36 to 43 inches; strong brown (7.5YR 5/6) fine sandy loam; weak medium subangular blocky structure; friable; common very fine roots; strongly acid; clear smooth boundary.

C1—43 to 53 inches; strong brown (7.5YR 5/6) loamy sand; single grained; loose; few very fine roots; strongly acid; clear smooth boundary.

C2—53 to 60 inches; strong brown (7.5YR 5/6) sandy loam; single grained; very friable; few very fine roots; strongly acid.

The thickness of the solum ranges from 36 to 53 inches. The Ap horizon has value of 3 or 4 and chroma of 2 or 3. In pedons where the surface layer has value of 3, it is less than 6 inches thick. In some pedons the Bt horizon has a layer of clay loam less than 5 inches thick. This horizon ranges from very strongly acid to medium acid. The C horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 6. It ranges from strongly acid to neutral.

Ambraw Series

The Ambraw series consists of poorly drained, moderately slowly permeable soils on bottom land. These soils formed in stratified, loamy alluvium. Slopes range from 0 to 2 percent.

Ambraw soils are similar to Beaucoup soils and commonly are adjacent to Beaucoup, Darwin, and Medway soils. Beaucoup soils are silty. They are slightly higher on the landscape than the Ambraw soils. The very poorly drained Darwin soils are clayey. They are in landscape positions similar to those of the Ambraw soils. The somewhat poorly drained Medway soils are on broad, low terraces above the Ambraw soils.

Typical pedon of Ambraw clay loam, 60 feet west and 180 feet south of the center of sec. 28, T. 14 N., R. 13 W.

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

A—8 to 16 inches; very dark gray (10YR 3/1) clay loam, gray (10YR 5/1) dry; weak medium subangular blocky structure; firm; few very fine roots; neutral; clear smooth boundary.

Bg1—16 to 22 inches; dark gray (10YR 4/1) clay loam; common fine prominent dark yellowish brown (10YR 3/6) mottles; weak medium subangular blocky structure; firm; common faint very dark gray (10YR 3/1) organic coatings on faces of peds; few fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

Bg2—22 to 30 inches; dark gray (10YR 4/1) sandy clay loam; common medium prominent dark yellowish brown (10YR 4/6) mottles; weak 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 rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

Bg3—30 to 42 inches; gray (10YR 5/1) sandy clay loam; many coarse distinct dark yellowish brown (10YR 4/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few thin dark gray (10YR 4/1) exteriors of peds; few fine rounded concretions (iron and manganese oxides); slightly acid; clear smooth boundary.

BCg—42 to 53 inches; dark grayish brown (10YR 4/2) sandy clay loam that has thin strata of grayish brown (10YR 5/2) loamy sand; many coarse distinct dark yellowish brown (10YR 4/6) mottles; weak fine prismatic structure parting to weak medium subangular blocky; firm; neutral; clear smooth boundary.

Cg—53 to 60 inches; grayish brown (10YR 5/2) sandy loam that has thin strata of loamy sand; common medium distinct dark yellowish brown (10YR 4/6) mottles; single grained; loose; neutral.

The thickness of the solum ranges from 50 to 60 inches. The thickness of the mollic epipedon ranges from 13 to 22 inches.

The Ap horizon has value of 2 or 3 and chroma of 1 or 2. It is clay loam, silty clay loam, or loam. The Bg horizon has value of 4 to 6 and chroma of 1 or 2. It ranges from medium acid to neutral. The Cg horizon is stratified clay loam, loam, or sandy loam and has thin strata of sandy material. It ranges from slightly acid to moderately alkaline.

Arenzville Series

The Arenzville series consists of moderately well drained, moderately permeable soils along upland streams. These soils formed in silty alluvium 20 to 40 inches deep over a dark, silty buried soil. Slopes range from 0 to 3 percent.

Arenzville soils are similar to Orion soils and commonly are adjacent to Orion and Wakeland soils. The somewhat poorly drained Orion and Wakeland soils are on bottom land below the Arenzville soils.

Typical pedon of Arenzville silt loam, 0 to 3 percent slopes, 1,340 feet north and 180 feet west of the southeast corner of sec. 35, T. 15 N., R. 13 W.

Ap—0 to 6 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; thin yellowish brown (10YR 5/4) and very dark grayish brown (10YR 3/2) strata; weak fine granular structure; friable; common very fine and fine roots; mildly alkaline; abrupt smooth boundary.

A—6 to 10 inches; brown (10YR 4/3) silt loam; yellowish brown (10YR 5/4) and very dark grayish brown (10YR 3/2) strata; weak fine granular structure; coarse bedding planes; friable; common very fine and fine roots; neutral; clear smooth boundary.

C—10 to 26 inches; brown (10YR 5/3) silt loam; dark grayish brown (10YR 4/2) and very dark grayish brown (10YR 3/2) strata; massive; medium bedding planes; friable; common very fine and fine roots; medium acid; abrupt smooth boundary.

Ab1—26 to 34 inches; very dark grayish brown (10YR 3/2) silt loam; few fine distinct brown (7.5YR 4/4) mottles; weak thick platy structure parting to weak medium granular; friable; few very fine and common fine roots; medium acid; clear smooth boundary.

Ab2—34 to 60 inches; very dark gray (10YR 3/1) silt loam; few fine distinct brown (7.5YR 4/4) and dark reddish gray (5YR 4/2) mottles; weak medium prismatic structure parting to weak medium subangular blocky; friable; few very fine and fine roots; slightly acid.

The depth to the buried soil ranges from 20 to 40 inches. The Ap horizon has value of 4 or 5 and chroma of 2 or 3. The C horizon has value of 3 to 5 and chroma of 2 or 3. It ranges from medium acid to mildly alkaline. The Ab horizon is commonly silt loam, but in some pedons it is silty clay loam. A C' horizon is below the Ab horizon in some pedons. It is silt loam or silty clay loam. It has hue of 10YR, value of 4, and chroma of 2. It ranges from slightly acid to mildly alkaline.

Assumption Series

The Assumption series consists of moderately well drained soils on side slopes. These soils formed in 20 to 40 inches of loess, in 0 to 24 inches of silty pedisediment, and in the underlying paleosol, which formed in glacial till. Permeability is moderate in the upper part of the profile and moderately slow in the lower part. Slopes range from 5 to 15 percent.

These soils have a thinner dark surface soil than is definitive for the Assumption series. This difference, however, does not significantly affect the usefulness or behavior of the soils.

Assumption soils are similar to Elco, Elkhart, and Tama soils and commonly are adjacent to Tama soils. Elco soils have a surface layer that is lighter colored than that of the Assumption soils. Elkhart and Tama soils formed entirely in loess. Tama soils are on the less sloping ridgetops and side slopes.

Typical pedon of Assumption silt loam, 5 to 10 percent slopes, eroded, 1,300 feet east and 400 feet south of the center of sec. 21, T. 15 N., R. 8 W.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) silt loam mixed with dark yellowish brown (10YR 4/4) subsoil material; brown (10YR 5/3) dry; weak fine granular structure; friable; few very fine roots; neutral; clear smooth boundary.

BA—9 to 13 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine subangular blocky structure; friable; few very fine roots; many faint dark brown (10YR 3/3) and few very dark grayish brown (10YR 3/2) organic coatings on faces of peds; slightly acid; clear smooth boundary.

Bt1—13 to 18 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine and medium subangular blocky structure; firm; many faint brown (10YR 4/3) clay films on faces of peds; few fine rounded concretions (iron and manganese oxides); slightly acid; clear smooth boundary.

Bt2—18 to 31 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium subangular blocky structure; firm; many distinct brown (10YR 4/3) clay films on faces of peds; few fine rounded concretions (iron and manganese oxides); slightly acid; clear smooth boundary.

Bt3—31 to 36 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium subangular blocky structure; firm; common distinct brown (10YR 4/3) clay films on faces of peds; about 15 percent fine sand; few fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

2Btg—36 to 60 inches; grayish brown (10YR 5/2) silty clay loam; common fine prominent dark yellowish brown (10YR 4/6) mottles; moderate medium and coarse subangular blocky structure; firm; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; about 25 percent sand; few fine rounded concretions (iron and manganese oxides); neutral.

The solum is more than 60 inches thick. The depth to the paleosol ranges from 20 to 40 inches.

The Ap 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 to 6. It is silty clay loam or silt loam. It is medium acid to neutral. The 2Btg horizon has hue of 5Y, 2.5Y, or 10YR, value of 4 to 6, and chroma of 1 to 4. It is silty clay loam or clay loam.

Beaucoup Series

The Beaucoup series consists of poorly drained, moderately slowly permeable soils on bottom land. These soils formed in silty alluvium. Slopes range from 0 to 2 percent.

Beaucoup soils are similar to Ambraw soils and commonly are adjacent to Ambraw and Darwin soils in the slightly lower positions on the landscape. Ambraw soils contain more sand than the Beaucoup soils. The very poorly drained Darwin soils are clayey.

Typical pedon of Beaucoup silty clay loam, rarely flooded, 1,247 feet east and 111 feet north of the southwest corner of sec. 10, T. 13 N., R. 13 W.

Ap—0 to 9 inches; very dark gray (10YR 3/1) silty clay loam, dark gray (10YR 4/1) dry; weak fine granular structure; friable; common very fine roots; neutral; abrupt smooth boundary.

AB—9 to 12 inches; very dark grayish brown (10YR 3/2) silty clay loam, dark gray (10YR 4/1) dry; common fine distinct brown (7.5YR 4/4) mottles; weak fine subangular blocky structure; friable; few very fine roots; common faint very dark gray (10YR 3/1) organic coatings on faces of peds; neutral; clear smooth boundary.

Bg1—12 to 18 inches; dark grayish brown (10YR 4/2) silty clay loam; common fine distinct brown (7.5YR 4/4) and dark yellowish brown (10YR 4/6) mottles; moderate medium subangular blocky structure; firm; few very fine roots; common faint dark gray (10YR 4/1) organic coatings on faces of peds; neutral; clear smooth boundary.

Bg2—18 to 26 inches; dark gray (10YR 4/1) silty clay loam; common medium prominent dark yellowish brown (10YR 4/6) mottles; moderate medium subangular blocky structure; firm; few very fine and common fine roots; many faint very dark gray (10YR 3/1) organic coatings on faces of peds; few medium rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

Bg3—26 to 33 inches; grayish brown (10YR 5/2) silty clay loam; many medium prominent yellowish brown (10YR 5/8) and few fine distinct strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; friable; few very fine and fine roots; few faint dark gray (10YR 4/1) organic coatings on faces of peds; few fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

BCg—33 to 46 inches; light brownish gray (10YR 6/2) silt loam; many medium prominent yellowish brown (10YR 5/8) and few fine prominent strong brown (7.5YR 5/6) mottles; weak coarse subangular blocky structure; friable; few very fine roots; few faint dark gray (10YR 4/1) and gray (10YR 5/1) organic coatings on faces of peds and lining pores; mildly alkaline; clear smooth boundary.

Cg—46 to 60 inches; light gray (5Y 6/1) silt loam; many medium prominent yellowish brown (10YR 5/8) mottles; massive; friable; few fine rounded concretions (iron and manganese oxides); mildly alkaline.

The thickness of the solum ranges from 40 to 55 inches. The thickness of the mollic epipedon ranges from 10 to 18 inches.

The Ap horizon has value of 2 or 3 and chroma of 1 or 2. The Bg horizon has hue of 10YR, 2.5Y, or 5Y. In some pedons it has strata of silt loam or sandy loam in the lower part. It ranges from slightly acid to mildly alkaline. The C horizon ranges from very fine sandy loam to silty clay loam and is stratified in some pedons.

Bloomfield Series

The Bloomfield series consists of somewhat excessively drained, rapidly permeable soils on dunelike ridges and side slopes in the uplands and on terraces. These soils formed in wind-deposited sandy material. Slopes range from 2 to 35 percent.

Bloomfield soils are similar to Plainfield soils and commonly are adjacent to Alvin soils. Plainfield soils do not have lamellae in the subsoil. Alvin soils have a higher content of clay in the subsoil than the Bloomfield soils. They are on ridges and side slopes below the Bloomfield soils.

Typical pedon of Bloomfield loamy sand, 7 to 18 percent slopes, 1,420 feet west and 820 feet south of the northeast corner of sec. 1, T. 13 N., R. 13 W.

Ap—0 to 7 inches; dark yellowish brown (10YR 4/4) loamy sand, yellowish brown (10YR 5/4) dry; weak medium granular structure; very friable; common very fine roots; neutral; abrupt smooth boundary.

E—7 to 31 inches; dark yellowish brown (10YR 4/6) fine sand; single grained; loose; few very fine roots; few dark brown (7.5YR 4/4) lamellae 1/16 to 1 inch thick; neutral; clear smooth boundary.

E&Bt—31 to 60 inches; yellowish brown (10YR 5/6) fine sand (E); single grained; loose; dark brown (7.5YR 4/4) loamy sand lamellae (Bt); massive; very friable; few fine roots; few lamellae 1/8 inch to 2 inches thick in the upper part; common lamellae 1 inch to 4 inches thick in the lower part; neutral.

The solum is more than 60 inches thick. In many pedons a few lamellae are within a depth of 36 inches. They are 1/16 to 1/8 inch thick. Below a depth of 36 inches, the lamellae increase in abundance and are 1 to 4 inches thick. The total thickness of the lamellae is more than 6 inches.

Some pedons have an A1 horizon. This horizon has value of 3 or 4 and chroma of 2 or 3. The A horizon is loamy sand or fine sand. The E horizon and the E part of the E&Bt horizon have value of 4 or 5 and chroma of 3 to 6. They are commonly fine sand but are loamy sand in some pedons. The Bt part of the E&Bt horizon has hue of 7.5YR or 10YR. It is medium acid to neutral. It is dominantly loamy sand, but a few lamellae are sandy loam.

Bold Series

The Bold series consists of well drained, moderately permeable soils on side slopes in the uplands. These soils formed in calcareous loess. Slopes range from 10 to 35 percent.

Bold soils are similar to Hamburg soils and commonly are adjacent to Fayette and Sylvan soils. The excessively drained Hamburg soils have more sand and coarse silt in the control section than the Bold soils. Fayette and Sylvan soils have an argillic horizon. They are on side slopes above the Bold soils.

Typical pedon of Bold silt loam, in an area of Bold-Sylvan complex, 15 to 35 percent slopes, severely eroded, 1,120 feet south and 260 feet east of the center of sec. 7, T. 16 N., R. 11 W.

Ap—0 to 5 inches; dark brown (10YR 4/3) silt loam, yellowish brown (10YR 5/4) dry; weak fine granular structure; friable; common very fine roots; slight effervescence; moderately alkaline; abrupt smooth boundary.

C1—5 to 17 inches; yellowish brown (10YR 5/4 and 5/6) silt loam; common medium distinct light gray (10YR 7/2) and few medium distinct yellowish brown (10YR 5/8) mottles; massive; very friable; common very fine roots; slight effervescence; moderately alkaline; clear smooth boundary.

C2—17 to 40 inches; light brownish gray (10YR 6/2) silt loam; common fine and medium distinct yellowish brown (10YR 5/6 and 5/8) mottles; massive; very friable; common very fine roots; few coarse irregular concretions (calcium and magnesium carbonates); strong effervescence; moderately alkaline; clear smooth boundary.

C3—40 to 60 inches; pale brown (10YR 6/3) silt loam; common medium distinct yellowish brown (10YR 5/8) mottles; massive; very friable; common fine rounded concretions (iron and manganese oxides); strong effervescence; moderately alkaline.

The thickness of the solum ranges from 3 to 10 inches. The Ap horizon has value of 4 or 5 and chroma of 2 to 4. Some pedons have an A1 horizon. This horizon has value of 3 or 4 and chroma of 1 to 4. Some pedons have an AC horizon. The C horizon has value of 5 or 6 and chroma of 2 to 8.

Clarksdale Series

The Clarksdale series consists of somewhat poorly drained, moderately slowly permeable soils on interstream divides. These soils formed in loess. Slopes range from 0 to 3 percent.

Clarksdale soils are similar to Ipava and Keomah soils and commonly are adjacent to Keomah and Rozetta soils. Ipava soils have a mollic epipedon. Keomah soils have a surface layer that is lighter colored than that of the Clarksdale soils. They are in landscape positions similar to those of the Clarksdale soils. The moderately well drained Rozetta soils are on more sloping ridgetops and side slopes.

Typical pedon of Clarksdale silt loam, 0 to 3 percent slopes, 1,380 feet north and 320 feet east of the center of sec. 26, T. 13 N., R. 10 W.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; common fine faint dark yellowish brown (10YR 3/4) mottles; weak medium and fine granular structure; friable; many very fine roots; slightly acid; clear smooth boundary.

E1—9 to 14 inches; dark grayish brown (10YR 4/2) silt loam, gray or light gray (10YR 6/1) dry; mixed with some dark brown (10YR 3/3) material from the Ap horizon; weak thin platy structure; friable; many very fine roots; many prominent silt coatings on faces of peds, white (10YR 8/1) dry; strongly acid; clear smooth boundary.

E2—14 to 19 inches; dark grayish brown (10YR 4/2) and dark gray (10YR 4/1) silt loam; moderate fine subangular blocky structure parting to weak fine granular; friable; many very fine roots; many prominent silt coatings on faces of peds, white (10YR 8/1) dry; strongly acid; gradual smooth boundary.

Bt1—19 to 23 inches; brown (10YR 5/3) silty clay loam; common medium distinct yellowish brown (10YR 5/6) and common fine faint grayish brown (10YR 5/2) mottles; strong medium and fine subangular blocky structure; firm; common very fine roots; many distinct very dark gray (10YR 3/1) and dark gray (10YR 4/1) organic coatings and clay films on faces of peds; strongly acid; clear smooth boundary.

Bt2—23 to 33 inches; brown (10YR 5/3) silty clay loam; common medium distinct yellowish brown (10YR 5/8) and common fine distinct dark yellowish brown (10YR 4/6) and pale olive (5Y 6/3) mottles;

moderate medium subangular blocky structure; firm; common very fine roots; many faint very dark gray (10YR 3/1) organic coatings and common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; strongly acid; clear smooth boundary.

Bt3—33 to 43 inches; light brownish gray (2.5Y 6/2) silty clay loam; many medium prominent yellowish brown (10YR 5/4) and common fine distinct pale olive (5Y 6/3) mottles; weak medium prismatic structure; firm; few very fine roots; common faint very dark gray (10YR 3/1) organic coatings and common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few medium rounded concretions (iron and manganese oxides); medium acid; clear smooth boundary.

BC—43 to 56 inches; light olive gray (5Y 6/2) silty clay loam; common medium prominent yellowish brown (10YR 5/6) mottles; weak coarse subangular blocky structure; friable; very few fine roots; few very dark gray (10YR 3/1) and dark gray (10YR 4/1) fillings in channels; slightly acid; gradual smooth boundary.

C—56 to 60 inches; light olive gray (5Y 6/2) silt loam; common coarse prominent yellowish brown (10YR 5/8) and common medium distinct grayish brown (10YR 5/2) mottles; massive; friable; few very fine roots; few very dark gray (10YR 3/1) and dark gray (10YR 4/1) fillings in channels; slightly acid.

The thickness of the solum ranges from 40 to 60 inches. The Ap horizon is 6 to 9 inches thick. It has value of 2 or 3 and chroma of 1 or 2. The Bt horizon has value of 4 to 6 and chroma of 1 to 4. It ranges from strongly acid to neutral. The C horizon is commonly silt loam but is silty clay loam in some pedons. It ranges from slightly acid to moderately alkaline.

Darwin Series

The Darwin series consists of very poorly drained, very slowly permeable soils on bottom land. These soils formed in clayey alluvium. Slopes range from 0 to 2 percent.

Darwin soils commonly are adjacent to Ambraw, Beaucoup, and Dupo soils. Ambraw and Beaucoup soils are poorly drained. Ambraw soils are loamy, and Beaucoup soils are silty. Ambraw soils are in landscape positions similar to those of the Darwin soils. Beaucoup and Dupo soils are on slight rises above the Darwin soils. The somewhat poorly drained Dupo soils have silty sediments 20 to 40 inches deep over a clayey buried soil.

Typical pedon of Darwin silty clay, 2,468 feet west and 300 feet north of the southeast corner of sec. 32, T. 13 N., R. 13 W.

Ap—0 to 8 inches; very dark gray (10YR 3/1) silty clay, dark grayish brown (10YR 4/2) dry; weak fine granular and weak fine subangular blocky structure; firm; few very fine roots; slightly acid; abrupt smooth boundary.

AB—8 to 13 inches; very dark gray (10YR 3/1) silty clay, dark gray (10YR 4/1) dry; few fine prominent dark yellowish brown (10YR 4/6) mottles; moderate fine subangular blocky structure; firm; few very fine roots; slightly acid; clear smooth boundary.

Bg1—13 to 19 inches; dark gray (10YR 4/1) silty clay; common fine prominent dark yellowish brown (10YR 4/6) mottles; moderate medium angular blocky structure; firm; very few fine roots; many faint very dark gray (10YR 3/1) organic coatings on faces of peds; slightly acid; clear smooth boundary.

Bg2—19 to 27 inches; dark gray (10YR 4/1) silty clay; common fine prominent dark yellowish brown (10YR 4/6) mottles; moderate medium angular blocky structure; firm; few very fine roots; many prominent dark gray (10YR 4/1) slickensides on faces of peds; slightly acid; gradual smooth boundary.

Bg3—27 to 42 inches; gray (5Y 5/1) silty clay; many fine prominent dark yellowish brown (10YR 4/6) mottles; strong medium prismatic structure parting to moderate medium angular blocky; firm; few very fine roots; many prominent dark gray (5Y 4/1) slickensides on faces of peds; neutral; gradual smooth boundary.

BCg—42 to 60 inches; gray (5Y 5/1) silty clay loam; common medium prominent yellowish brown (10YR 5/8) and dark yellowish brown (10YR 4/6) mottles; weak medium prismatic structure parting to moderate medium angular blocky; firm; common prominent dark gray (5Y 4/1) slickensides on faces of peds; neutral.

The thickness of the solum ranges from 45 to 60 inches. The thickness of the mollic epipedon ranges from 10 to 24 inches.

The Ap horizon has value of 2 or 3 and chroma of 1 or 2. In some pedons it is silty clay loam. The Bg horizon has chroma of 1 or 2.

Denny Series

The Denny series consists of poorly drained, slowly permeable soils in depressions on uplands. These soils formed in loess. Slopes range from 0 to 2 percent.

Denny soils are similar to Wagner soils and commonly are adjacent to Ipava and Sable soils. Wagner soils have more clay in the control section than the Denny soils and formed in clayey alluvium. Ipava and Sable soils have a mollic epipedon. The somewhat poorly drained Ipava soils surround the depressional Denny soils. Sable soils are on broad, low flats.

Typical pedon of Denny silt loam, 1,640 feet west and 520 feet north of the southeast corner of sec. 32, T. 15 N., R. 12 W.

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

A—7 to 9 inches; very dark gray (10YR 3/1) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; common very fine and fine roots; slightly acid; abrupt smooth boundary.

E—9 to 17 inches; grayish brown (10YR 5/2) silt loam; common fine prominent strong brown (7.5YR 4/6) mottles; moderate medium platy structure; friable; common fine and few very fine roots; few faint dark gray (10YR 4/1) and very dark gray (10YR 3/1) organic coatings on faces of peds; many fine rounded concretions (iron and manganese oxides); slightly acid; abrupt smooth boundary.

Btg1—17 to 21 inches; grayish brown (10YR 5/2) silty clay loam; few fine prominent strong brown (7.5YR 4/6) mottles; weak fine prismatic structure parting to weak fine and medium subangular blocky; firm; common fine and few very fine roots; common distinct dark gray (10YR 4/1) clay films and common faint very dark gray (10YR 3/1) organic coatings on faces of peds; common fine rounded concretions (iron and manganese oxides); medium acid; clear smooth boundary.

Btg2—21 to 38 inches; grayish brown (10YR 5/2) silty clay loam; few fine prominent strong brown (7.5YR 4/6) and common fine prominent yellowish brown (10YR 5/8) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; firm; common fine and few very fine roots; common prominent dark gray (10YR 4/1) clay films and few faint very dark gray (10YR 3/1) organic coatings on faces of peds; common medium rounded concretions (iron and manganese oxides); medium acid; clear smooth boundary.

Btg3—38 to 48 inches; grayish brown (10YR 5/2) silty clay loam; common fine prominent strong brown (7.5YR 4/6) and many medium prominent yellowish brown (10YR 5/8) mottles; weak medium prismatic structure parting to weak medium subangular blocky; firm; few fine roots; common prominent dark gray (10YR 4/1) clay films on faces of peds; common medium rounded concretions (iron and manganese oxides); medium acid; clear smooth boundary.

BCg—48 to 60 inches; light brownish gray (10YR 6/2) silty clay loam; few fine prominent strong brown (7.5YR 4/6), common medium prominent brownish yellow (10YR 6/8), and many medium prominent yellowish brown (10YR 5/8) mottles; weak coarse subangular blocky structure; friable; few distinct dark gray (10YR 4/1) clay films on faces of peds and very dark gray (10YR 3/1) fillings in channels; common medium rounded concretions (iron and manganese oxides); slightly acid.

The thickness of the solum ranges from 48 to more than 60 inches. The Ap horizon is 7 to 9 inches thick. It has value of 2 or 3 and chroma of 1 or 2. The E horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 1 or 2. It ranges from 6 to 12 inches in thickness. The Btg horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, and chroma of 1 or 2. It is medium acid or slightly acid.

Dickinson Series

The Dickinson series consists of somewhat excessively drained, moderately rapidly permeable soils on low terraces. These soils formed in water-deposited loamy and sandy material. Slopes range from 0 to 2 percent.

Dickinson soils are similar to Onarga soils and commonly are adjacent to Hoopeston, Onarga, and Sparta soils. Onarga soils have more clay in the subsoil than the Dickinson soils. They are on the more sloping ridges. The somewhat poorly drained Hoopeston soils are lower on the landscape than the Dickinson soils. Sparta soils have more sand than the Dickinson soils. They are in the more sloping areas.

Typical pedon of Dickinson sandy loam, 90 feet east and 680 feet south of the northwest corner of sec. 8, T. 15 N., R. 13 W.

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) sandy loam, dark grayish brown (10YR 4/2) dry; weak fine granular structure; very friable; few very fine and fine roots; neutral; clear smooth boundary.

A—8 to 19 inches; very dark grayish brown (10YR 3/2) sandy loam, dark grayish brown (10YR 4/2) dry; moderate fine granular structure; very friable; few very fine and fine roots; slightly acid; clear smooth boundary.

Bw1—19 to 24 inches; brown (10YR 4/3) sandy loam; weak medium subangular blocky structure; friable; few very fine roots; few faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; medium acid; clear smooth boundary.

Bw2—24 to 33 inches; brown (10YR 4/3) sandy loam; moderate medium subangular blocky structure; friable; few faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; medium acid; clear smooth boundary.

Bw3—33 to 41 inches; dark yellowish brown (10YR 4/4) sandy loam; moderate medium subangular blocky structure; friable; few faint brown (7.5YR 4/4) clay films on faces of peds; few faint very dark grayish brown (10YR 3/2) fillings in channels; few fine rounded concretions (iron and manganese oxides); medium acid; clear smooth boundary.

BC—41 to 47 inches; dark yellowish brown (10YR 4/4) and brown (7.5YR 4/4) sandy loam; weak medium and coarse subangular blocky structure; friable; few fine and medium rounded concretions (iron and manganese oxides); medium acid; clear smooth boundary.

C—47 to 60 inches; dark yellowish brown (10YR 4/6) loamy sand; single grained; loose; strongly acid.

The thickness of the solum ranges from 40 to 50 inches. The Ap and A horizons have value of 2 or 3 and chroma of 1 or 2. The Bw horizon has value of 4 or 5 and chroma of 3 to 6. It is strongly acid or medium acid.

Dupo Series

The Dupo series consists of somewhat poorly drained soils on bottom land. These soils formed in silty alluvium 20 to 40 inches deep over a clayey buried soil. Permeability is moderate in the upper part of the profile and slow in the lower part. Slopes range from 0 to 2 percent.

Dupo soils are similar to Orion soils and commonly are adjacent to Beaucoup and Darwin soils. Orion soils have a silty buried soil. The poorly drained Beaucoup and very poorly drained Darwin soils are Mollisols. They have more clay in the upper part than the Dupo soils. Also, they are lower on the bottom land.

Typical pedon of Dupo silt loam, 300 feet east and 2,460 feet south of the northwest corner of sec. 27, T. 13 N., R. 13 W.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; few very fine roots; mildly alkaline; clear smooth boundary.

A—8 to 11 inches; dark grayish brown (10YR 4/2) silt loam; weak fine subangular blocky structure; friable; few very fine roots; mildly alkaline; clear smooth boundary.

C1—11 to 16 inches; stratified brown (10YR 5/3) and dark grayish brown (10YR 4/2) silt loam; massive; friable; few very fine roots; neutral; clear smooth boundary.

C2—16 to 26 inches; stratified dark grayish brown (10YR 4/2) and brown (10YR 5/3) silt loam; few fine prominent dark reddish brown (5YR 3/4) and yellowish red (5YR 4/6) mottles; massive; friable; few fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

2Ab1—26 to 46 inches; black (10YR 2/1) silty clay; few medium distinct dark reddish brown (5YR 3/3) mottles; weak medium subangular blocky structure; firm; neutral; clear smooth boundary.

2Ab2—46 to 60 inches; very dark gray (10YR 3/1) silty clay; few fine prominent dark reddish brown (5YR 3/4) mottles; moderate medium angular blocky structure; firm; neutral.

The depth to the 2Ab horizon ranges from 20 to 40 inches. The Ap horizon has value of 3 to 5 and chroma of 2 or 3. The C horizon generally has value of 4 to 6 but has strata with value of 3 to 6. It ranges from medium acid to moderately alkaline. The 2Ab horizon has chroma of 1 or 2. It is commonly silty clay, but in some pedons it is silty clay loam in the lower part. It is neutral or mildly alkaline.

Elco Series

The Elco series consists of moderately well drained soils on side slopes in the uplands. These soils formed in 20 to 40 inches of loess, in 0 to 24 inches of silty pedisediment, and in the underlying paleosol, which formed in glacial till. Permeability is moderate in the upper part of the profile and moderately slow in the lower part. Slopes range from 10 to 25 percent.

Elco soils are similar to Assumption, Hickory, and Rozetta soils and commonly are adjacent to Hickory, Rozetta, and Ursa soils. Assumption soils have a mollic epipedon. Hickory soils formed in glacial till on side slopes below the Elco soils. Rozetta soils formed in loess on the less sloping side slopes and ridgetops. Ursa soils formed in less than 20 inches of loess and in the underlying paleosol, which formed in glacial till. They occur as areas closely intermingled with areas of the Elco soils on side slopes.

Typical pedon of Elco silt loam, 10 to 15 percent slopes, eroded, 1,460 feet south and 480 feet east of the center of sec. 31, T. 13 N., R. 10 W.

Ap—0 to 5 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; yellowish brown (10YR 5/4) fragments of subsoil material; weak fine granular structure; friable; many very fine roots; neutral; abrupt smooth boundary.

Bt1—5 to 8 inches; yellowish brown (10YR 5/6) silt loam; weak fine subangular blocky structure; friable; many very fine roots; common distinct silt coatings, light gray (10YR 7/1) dry, and few distinct brown (10YR 4/3) clay films on faces of peds; slightly acid; clear smooth boundary.

Bt2—8 to 17 inches; yellowish brown (10YR 5/6) silty clay loam; moderate fine subangular blocky structure; firm; many very fine roots; common faint silt coatings, light gray (10YR 7/1) dry, and common distinct brown (10YR 5/3 and 4/3) clay films on faces of peds; few fine rounded concretions (iron and manganese oxides); strongly acid; clear smooth boundary.

2Bt3—17 to 23 inches; brown (10YR 5/3) silty clay loam; few fine distinct dark yellowish brown (10YR 4/6), yellowish brown (10YR 5/6), and grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure; firm; many very fine roots; few faint silt coatings, light gray (10YR 7/1) dry, and common faint brown (10YR 5/3) clay films on faces of peds; about 15 percent fine sand; few fine rounded concretions (iron and manganese oxides); medium acid; clear smooth boundary.

2Btg1—23 to 46 inches; light brownish gray (10YR 6/2) silty clay loam; many medium distinct dark yellowish brown (10YR 4/6) and yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; common very fine roots; common distinct dark grayish brown (10YR 4/2) and few distinct very dark grayish brown (10YR 3/2) clay films on faces of peds; few fine rounded concretions (iron and manganese oxides); few chert pebbles; slightly acid; clear smooth boundary.

2Btg2—46 to 60 inches; light brownish gray (10YR 6/2) silty clay loam; common medium distinct dark yellowish brown (10YR 4/6) mottles; moderate coarse subangular blocky structure; firm; few very fine roots; common distinct grayish brown (10YR 5/2) clay films on faces of peds; common fine rounded concretions (iron and manganese oxides); common chert pebbles; neutral.

The solum is more than 60 inches thick. The depth to the paleosol ranges from 20 to 40 inches.

The Ap horizon has chroma of 2 to 4. In a few uneroded areas where the surface layer is less than 6 inches thick, it has value of 3 and chroma of 2 or 3. It is commonly silt loam, but in severely eroded areas it is silty clay loam. The Bt horizon has value of 4 or 5 and chroma of 3 to 6. It ranges from very strongly acid to neutral. The 2Bt horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, and chroma of 1 to 4. It is silty clay loam or clay loam. It ranges from strongly acid to neutral.

Elkhart Series

The Elkhart series consists of well drained, moderately permeable soils on side slopes in the uplands. These soils formed in calcareous loess. Slopes range from 5 to 10 percent.

These soils have a thinner dark surface soil than is definitive for the Elkhart series. This difference, however, does not significantly affect the usefulness or behavior of the soils.

Elkhart soils are similar to Assumption and Tama soils and commonly are adjacent to Assumption, Ipava, and Tama soils. Assumption and Tama soils are in landscape positions similar to those of the Elkhart soils. Assumption soils have a paleosol within a depth of 40 inches. Tama soils do not have free carbonates within a depth of 40 inches. The somewhat poorly drained Ipava soils are in the less sloping areas.

Typical pedon of Elkhart silt loam, 5 to 10 percent slopes, eroded, 883 feet west and 136 feet north of the center of sec. 19, T. 16 N., R. 8 W.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; mixed with dark yellowish brown (10YR 4/4) subsoil material; weak fine granular structure; friable; common very fine roots; slightly acid; abrupt smooth boundary.

Bt1—9 to 13 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak fine subangular blocky structure; friable; common very fine roots; common faint very dark grayish brown (10YR 3/2) clay films on faces of peds; neutral; clear smooth boundary.

Bt2—13 to 25 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium subangular blocky structure; friable; common very fine and few fine roots; few faint brown (10YR 4/3) clay films on faces of peds; few faint very dark grayish brown (10YR 3/2) fillings in channels; neutral; clear smooth boundary.

BC—25 to 28 inches; dark yellowish brown (10YR 4/4) silt loam; few fine distinct pale brown (10YR 6/3) and dark yellowish brown (10YR 4/6) mottles; weak coarse subangular blocky structure; friable; common very fine and few fine roots; few faint very dark grayish brown (10YR 3/2) fillings in channels; slight effervescence; moderately alkaline; clear smooth boundary.

C1—28 to 40 inches; light olive brown (2.5Y 5/4) silt loam; common medium distinct grayish brown (10YR 5/2) and prominent yellowish brown (10YR 5/8) mottles; massive; friable; few very fine roots; few faint very dark grayish brown (10YR 3/2) fillings in channels; common fine rounded concretions (iron and manganese oxides); slight effervescence; moderately alkaline; clear smooth boundary.

C2—40 to 60 inches; light brownish gray (10YR 6/2) silt loam; common coarse distinct dark yellowish brown (10YR 3/6 and 4/6) and yellowish brown (10YR 5/8) mottles; massive; friable; few fine rounded concretions (iron and manganese oxides); strong effervescence; moderately alkaline.

The thickness of the solum ranges from 20 to 40 inches. The mollic epipedon is 6 to 9 inches thick.

The Ap horizon has chroma of 2 or 3. The Bt horizon has value of 4 or 5 and chroma of 4 to 6. It ranges from slightly acid to moderately alkaline. The C horizon is mildly alkaline or moderately alkaline.

Fayette Series

The Fayette series consists of well drained, moderately permeable soils on ridgetops and side slopes in the uplands. These soils formed in loess. Slopes range from 2 to 30 percent.

Fayette soils are similar to Rozetta and Sylvan soils and commonly are adjacent to Hickory and Sylvan soils. Rozetta soils are moderately well drained. Hickory soils formed in glacial till on side slopes below the Fayette soils. Sylvan soils have free carbonates within a depth of 40 inches. They are in landscape positions similar to those of the Fayette soils.

Typical pedon of Fayette silt loam, 2 to 5 percent slopes, 2,560 feet east and 650 feet north of the southwest corner of sec. 15, T. 15 N., R. 12 W.

Ap—0 to 8 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine granular structure; friable; many very fine and fine roots; neutral; abrupt smooth boundary.
E—8 to 10 inches; brown (10YR 4/3) silt loam; moderate thin platy structure; friable; many very fine and fine roots; few faint dark grayish brown (10YR 4/2) silt coatings on faces of peds; neutral; clear smooth boundary.
BE—10 to 15 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine subangular blocky structure; firm; many very fine and fine roots; few faint silt coatings on faces of peds, very pale brown (10YR 7/3) dry; neutral; clear smooth boundary.
Bt1—15 to 22 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak fine prismatic structure parting to weak medium subangular blocky; firm; many very fine and fine roots; common faint brown (10YR 4/3) clay films on faces of peds; few faint silt coatings on faces of peds, very pale brown (10YR 7/3) dry; strongly acid; clear smooth boundary.
Bt2—22 to 30 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium prismatic structure; firm; many very fine and fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; few faint silt coatings on faces of peds, very pale brown (10YR 7/3) dry; strongly acid; clear smooth boundary.
Bt3—30 to 39 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak medium prismatic structure parting to weak medium subangular blocky; firm; many very fine and fine roots; common faint brown (10YR 4/3) clay films on faces of peds; common faint silt coatings on faces of peds, very pale brown (10YR 7/3) dry; few fine rounded concretions (iron and manganese oxides); medium acid; clear smooth boundary.
Bt4—39 to 49 inches; dark yellowish brown (10YR 4/4) silt loam; weak medium prismatic structure parting to weak coarse subangular blocky; friable; many fine roots; common faint brown (10YR 4/3) clay films on faces of peds; few faint silt coatings on vertical faces of prisms, very pale brown (10YR 7/3) dry; few fine rounded concretions (iron and manganese oxides); medium acid; gradual smooth boundary.
BC—49 to 60 inches; dark yellowish brown (10YR 4/4) silt loam; weak coarse prismatic structure; friable; many very fine and fine roots; few faint silt coatings on faces of peds, very pale brown (10YR 7/3) dry; few fine rounded concretions (iron and manganese oxides); medium acid.

The thickness of the solum ranges from 40 to more than 60 inches. The Ap horizon is commonly silt loam and has chroma of 2 or 3. In severely eroded areas, however, it is silty clay loam and has chroma of 3 or 4. The Bt horizon has value of 4 or 5 and chroma of 3 or 4. It ranges from strongly acid to slightly acid. Some pedons have a C horizon within a depth of 60 inches. This horizon has value of 4 or 5 and chroma of 4 to 6. It ranges from slightly acid to mildly alkaline.

Hamburg Series

The Hamburg series consists of somewhat excessively drained, moderately permeable soils on cone-shaped hills and side slopes along bluffs. These soils formed in loess. Slopes range from 20 to 60 percent.

Hamburg soils are similar to Bold soils and commonly are adjacent to Fayette and Sylvan soils. Bold soils have less sand and coarse silt in the control section than the Hamburg soils. The well drained Fayette and Sylvan soils are on the less sloping ridgetops and side slopes. They have an argillic horizon.

Typical pedon of Hamburg silt loam, 35 to 60 percent slopes, 1,880 feet east and 120 feet south of the northwest corner of sec. 35, T. 13 N., R. 13 W.

A—0 to 6 inches; brown (10YR 4/3) silt loam, dark yellowish brown (10YR 4/4) dry; weak fine granular structure; friable; common very fine and fine roots; slight effervescence; moderately alkaline; abrupt smooth boundary.
AC—6 to 15 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine granular structure; friable; common very fine and fine roots; slight effervescence; moderately alkaline; clear smooth boundary.
C1—15 to 43 inches; dark yellowish brown (10YR 4/4) silt; very weak fine granular structure; friable; few very fine roots; slight effervescence; moderately alkaline; clear smooth boundary.
C2—43 to 60 inches; yellowish brown (10YR 5/4) silt; massive; friable; strong effervescence; moderately alkaline.

Reaction is mildly alkaline or moderately alkaline throughout the profile. The A horizon has value of 3 or 4 and chroma of 2 or 3. In pedons where it has value of 3 and chroma of 2, it is less than 6 inches thick. Some pedons do not have an AC horizon. The C horizon has value of 4 to 6 and chroma of 3 or 4. It is silt or silt loam.

Hartsburg Series

The Hartsburg series consists of poorly drained, moderately permeable soils on upland flats. These soils formed in loess. Slopes range from 0 to 2 percent.

Hartsburg soils are similar to Sable soils and commonly are adjacent to Ipava and Sable soils. Sable soils do not have free carbonates within a depth of 40 inches. They are in landscape positions similar to those of the Hartsburg soils. The somewhat poorly drained Ipava soils are on low ridges above the Hartsburg soils.

Typical pedon of Hartsburg silty clay loam, 2,415 feet north and 70 feet east of the center of sec. 17, T. 14 N., R. 8 W.

Ap—0 to 7 inches; black (10YR 2/1) silty clay loam, very dark gray (10YR 3/1) dry; weak medium granular structure; firm; common very fine roots; few fine rounded concretions (iron and manganese oxides); neutral; abrupt smooth boundary.

A—7 to 13 inches; very dark gray (10YR 3/1) silty clay loam, dark gray (10YR 4/1) dry; common fine distinct brown (10YR 4/3) mottles; weak fine subangular blocky structure; firm; few fine roots; few fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

Bg1—13 to 18 inches; dark grayish brown (10YR 4/2) silty clay loam; common fine prominent yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to weak medium subangular blocky; friable; few fine roots; common faint very dark gray (10YR 3/1) and dark gray (10YR 4/1) organic coatings on faces of peds; common fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

Bg2—18 to 23 inches; grayish brown (10YR 5/2) silty clay loam; common fine prominent yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to weak medium subangular blocky; friable; few fine roots; few faint gray (10YR 5/1) clay films on faces of peds; common fine rounded concretions (iron and manganese oxides); mildly alkaline; clear smooth boundary.

Bg3—23 to 36 inches; grayish brown (10YR 5/2) silty clay loam; common fine prominent yellowish brown (10YR 5/8 and 5/6) mottles; moderate medium prismatic structure parting to weak medium subangular blocky; friable; few very fine roots; common black (10YR 2/1) krotovinas; few faint gray (10YR 5/1) clay films on faces of peds; many fine and few medium irregular concretions (calcium carbonates); violent effervescence; mildly alkaline; clear smooth boundary.

BCg—36 to 49 inches; grayish brown (10YR 5/2) silty clay loam; many medium prominent yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; slight effervescence; mildly alkaline; gradual smooth boundary.

Cg—49 to 60 inches; light brownish gray (10YR 6/2) silt loam; many coarse prominent yellowish brown (10YR 5/6) and light yellowish brown (10YR 6/4) mottles; massive; friable; slight effervescence; mildly alkaline.

The thickness of the solum ranges from 40 to 50 inches. The mollic epipedon is 10 to 16 inches thick. The depth to free carbonates ranges from 15 to 35 inches.

The Ap horizon has value of 2 or 3. The Bg horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, and chroma of 1 or 2. It ranges from neutral to moderately alkaline. The C horizon is mildly alkaline or moderately alkaline.

Hickory Series

The Hickory series consists of well drained, moderately permeable soils on side slopes on strongly dissected uplands. These soils formed in glacial till. Slopes range from 15 to 50 percent.

Hickory soils are similar to Elco soils and commonly are adjacent to Elco, Fayette, and Rozetta soils on the higher side slopes. Elco soils formed in 20 to 40 inches of loess and in the underlying paleosol, which formed in glacial till. Fayette and Rozetta soils formed in loess.

Typical pedon of Hickory silt loam, 20 to 50 percent slopes, 2,400 feet south and 167 feet east of the northwest corner of sec. 33, T. 13 N., R. 8 W.

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

E—3 to 8 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine granular structure; friable; many very fine roots; few faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; medium acid; clear smooth boundary.

BE—8 to 17 inches; dark yellowish brown (10YR 4/6) loam; few fine faint yellowish brown (10YR 5/6) mottles; weak fine subangular blocky structure; friable; many very fine roots; strongly acid; gradual smooth boundary.

Bt1—17 to 30 inches; dark yellowish brown (10YR 4/6) clay loam; few medium faint yellowish brown (10YR 5/8) mottles; moderate medium and fine subangular blocky structure; firm; common very fine roots; common faint brown (7.5YR 4/4) clay films on faces of peds; few fine rounded concretions (iron and manganese oxides); very strongly acid; gradual smooth boundary.

Bt2—30 to 45 inches; dark yellowish brown (10YR 4/4) clay loam; common medium distinct yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; firm; common very fine roots; common distinct dark yellowish brown (10YR 3/4) clay films on faces of peds; many fine rounded concretions (iron and manganese oxides); common chert and quartz pebbles; medium acid; gradual smooth boundary.

BC—45 to 55 inches; yellowish brown (10YR 5/4) loam; common medium distinct yellowish brown (10YR 5/8) mottles; weak medium and coarse subangular blocky structure; firm; common very fine roots; common distinct brown (7.5YR 4/4) fillings in pores;

many fine rounded concretions (iron and manganese oxides); common quartz pebbles; neutral; clear smooth boundary.

C—55 to 60 inches; light yellowish brown (2.5Y 6/4) loam; many coarse prominent yellowish brown (10YR 5/8) mottles; weak coarse subangular blocky structure; friable; common very fine roots; few faint brown (7.5YR 4/4) fillings in pores; few medium concretions (calcium carbonates); few quartz pebbles; slight effervescence; moderately alkaline.

The thickness of the solum and the depth to free carbonates range from 45 to 60 inches. The loess mantle is less than 20 inches thick.

The A or Ap horizon has value of 2 to 5 and chroma of 2 to 4. It is commonly silt loam or loam but in severely eroded areas is clay loam. The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6. It ranges from very strongly acid to neutral. The C horizon is mildly alkaline or moderately alkaline.

Hoopeston Series

The Hoopeston series consists of somewhat poorly drained soils on low terraces. These soils formed in loamy and sandy outwash. Permeability is moderately rapid in the upper part of the profile and rapid in the lower part. Slopes range from 0 to 3 percent.

Hoopeston soils are similar to Watseka soils and commonly are adjacent to Onarga and Sparta soils. Watseka soils are sandy. The well drained Onarga and excessively drained Sparta soils are on the more sloping ridges above the Hoopeston soils. Onarga soils have more clay in the subsoil than the Hoopeston soils. Sparta soils are sandy.

Typical pedon of Hoopeston sandy loam, 0 to 3 percent slopes, 1,418 feet north and 113 feet west of the center of sec. 8, T. 15 N., R. 13 W.

Ap—0 to 10 inches; very dark brown (10YR 2/2) sandy loam, grayish brown (10YR 5/2) dry; weak fine granular structure; very friable; few very fine roots; common faint black (10YR 2/1) organic coatings on faces of peds; neutral; abrupt smooth boundary.

A—10 to 21 inches; very dark grayish brown (10YR 3/2) sandy loam, grayish brown (10YR 5/2) dry; common fine faint dark yellowish brown (10YR 3/4) mottles; weak medium granular structure; very friable; few very fine roots; few faint very dark gray (10YR 3/1) organic coatings on faces of peds; neutral; gradual smooth boundary.

AB—21 to 33 inches; brown (10YR 4/3) sandy loam; common medium faint dark grayish brown (10YR 4/2) and dark yellowish brown (10YR 3/4) mottles; weak fine subangular blocky structure; very friable; few very fine roots; few faint very dark gray (10YR 3/1) organic coatings on faces of peds; common fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

Bw1—33 to 40 inches; brown (10YR 4/3) sandy loam; common medium faint dark yellowish brown (10YR 3/4) and common fine faint dark yellowish brown (10YR 4/4) mottles; weak medium subangular blocky structure; friable; few very fine roots; few fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

Bw2—40 to 47 inches; dark yellowish brown (10YR 4/4) sandy loam; common medium faint dark yellowish brown (10YR 3/4) and few fine faint brown (10YR 5/3) mottles; moderate medium subangular blocky structure; friable; few very fine roots; few medium rounded concretions (iron and manganese oxides); slightly acid; clear smooth boundary.

BC—47 to 53 inches; dark yellowish brown (10YR 4/4) sandy loam and loamy sand; few fine and common coarse faint dark yellowish brown (10YR 4/6 and 3/4) mottles; weak medium subangular blocky structure; friable; slightly acid; clear smooth boundary.

C—53 to 60 inches; dark yellowish brown (10YR 4/4) sand that has thin strata of loamy sand; few fine distinct dark yellowish brown (10YR 4/6) mottles; massive; loose; dark yellowish brown (10YR 3/4) stains on sand grains; slightly acid.

The thickness of the solum ranges from 35 to 55 inches. The thickness of the mollic epipedon ranges from 15 to 22 inches.

The A horizon is sandy loam or loam. It has chroma of 1 to 3. The Bw and C horizons are slightly acid or neutral. The Bw horizon has value of 4 or 5 and chroma of 2 to 4. It is sandy loam or loam. The C horizon is stratified sandy loam, loamy sand, or sand.

Ipava Series

The Ipava series consists of somewhat poorly drained, moderately slowly permeable soils on broad upland ridges and on side slopes along shallow drainageways. These soils formed in loess. Slopes range from 0 to 5 percent.

Ipava soils are similar to Clarksdale soils and commonly are adjacent to Tama, Sable, and Virden soils. Clarksdale soils have a dark surface soil that is less than 10 inches thick. The moderately well drained Tama soils have less clay in the control section than the Ipava soils. They are on the more sloping ridges and side slopes. The poorly drained Sable and Virden soils are in shallow drainageways and on broad flats below the Ipava soils.

Typical pedon of Ipava silt loam, 0 to 2 percent slopes, 1,015 feet west and 197 feet south of the northeast corner of sec. 16, T. 14 N., R. 9 W.

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

AB—9 to 18 inches; black (10YR 2/1) silty clay loam; moderate fine subangular blocky structure; friable; common very fine roots; slightly acid; clear smooth boundary.

Bt1—18 to 26 inches; dark grayish brown (10YR 4/2) silty clay loam; common medium prominent yellowish brown (10YR 5/6) and few fine prominent dark yellowish brown (10YR 4/6) mottles; weak fine prismatic structure parting to moderate medium subangular blocky; firm; common fine roots; common faint very dark gray (10YR 3/1) clay films on faces of peds; common fine rounded concretions (iron and manganese oxides); medium acid; clear smooth boundary.

Bt2—26 to 33 inches; brown (10YR 5/3) silty clay loam; common medium distinct yellowish brown (10YR 5/6 and 5/8) and many fine distinct light brownish gray (10YR 6/2) mottles; weak fine prismatic structure parting to moderate medium subangular blocky; firm; common very fine roots; common distinct very dark gray (10YR 3/1) clay films on faces of peds; few fine rounded concretions (iron and manganese oxides); medium acid; gradual smooth boundary.

Bt3—33 to 43 inches; brown (10YR 5/3) silty clay loam; common medium distinct yellowish brown (10YR 5/6 and 5/8) and common fine distinct pale olive (5Y 6/3) mottles; moderate medium subangular blocky structure; firm; few very fine roots; few faint very dark gray (10YR 3/1) clay films on faces of peds; common fine rounded concretions (iron and manganese oxides); neutral; gradual smooth boundary.

BC—43 to 54 inches; brown (10YR 5/3) silty clay loam; many medium prominent yellowish brown (10YR 5/8) and common fine distinct light brownish gray (2.5Y 6/2) mottles; weak medium subangular blocky structure; friable; common distinct black (10YR 2/1) fillings in channels; mildly alkaline; clear smooth boundary.

Cg—54 to 60 inches; light brownish gray (10YR 6/2) silt loam; common fine prominent yellowish brown (10YR 5/6 and 5/8) mottles; massive; friable; few faint black (10YR 2/1) fillings in channels; mildly alkaline.

The thickness of the solum ranges from 40 to more than 60 inches. The mollic epipedon ranges from 14 to 24 inches in thickness and includes the upper part of the subsoil in some pedons.

The Ap 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 3 to 6, and chroma of 1 to 4. It ranges from medium acid to mildly alkaline. The C horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2 to 8. It is neutral or mildly alkaline.

Kendall Series

The Kendall series consists of somewhat poorly drained, moderately permeable soils on terraces along the major streams. These soils formed in loess and in the underlying stratified, silty outwash. Slopes range from 1 to 5 percent.

These soils do not have stratified, loamy outwash within 60 inches of the surface, which is definitive for the Kendall series. This difference, however, does not significantly affect the usefulness or behavior of the soils.

Kendall soils commonly are adjacent to Lawson and Wakeland soils. The adjacent soils formed in silty alluvium on flood plains below the Kendall soils.

Typical pedon of Kendall silt loam, 1 to 5 percent slopes, 1,320 feet north and 561 feet west of the southeast corner of sec. 8, T. 15 N., R. 11 W.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) and brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine and medium granular structure; friable; common very fine roots; few fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

E—8 to 14 inches; grayish brown (10YR 5/2) and brown (10YR 5/3) silt loam; few fine prominent dark yellowish brown (10YR 4/6) mottles; weak thin platy structure parting to weak fine granular; friable; few very fine roots; few faint silt coatings on faces of peds, white (10YR 8/1) dry; few fine rounded concretions (iron and manganese oxides); medium acid; clear smooth boundary.

BE—14 to 19 inches; brown (10YR 5/3) and grayish brown (10YR 5/2) silt loam; few fine prominent dark yellowish brown (10YR 4/6) mottles; weak fine subangular blocky structure; friable; few very fine roots; many faint silt coatings on faces of peds, white (10YR 8/1) dry; few fine rounded concretions (iron and manganese oxides); medium acid; clear smooth boundary.

Bt1—19 to 29 inches; grayish brown (10YR 5/2) silty clay loam; common fine prominent dark yellowish brown (10YR 4/6) mottles; moderate fine and medium subangular blocky structure; firm; few very fine roots; few faint dark grayish brown (10YR 4/2) clay films on faces of peds; common fine rounded concretions (iron and manganese oxides); strongly acid; clear smooth boundary.

Bt2—29 to 37 inches; grayish brown (10YR 5/2) silty clay loam; common medium prominent yellowish brown (10YR 5/6) and many medium prominent dark yellowish brown (10YR 4/6) mottles; moderate medium subangular blocky structure; firm; few faint brown (7.5YR 4/2) and dark grayish brown (10YR 4/2) clay films on faces of peds; common fine rounded concretions (iron and manganese oxides); slightly acid; clear smooth boundary.

BC—37 to 57 inches; yellowish brown (10YR 5/4 and 5/6) silty clay loam; many fine faint dark yellowish brown (10YR 4/6) mottles; moderate medium subangular blocky structure; firm; few faint dark grayish brown (10YR 4/2) and brown (7.5YR 4/2) clay films on faces of peds and lining pores; common fine rounded concretions (iron and manganese oxides); mildly alkaline; clear smooth boundary.

C—57 to 60 inches; light yellowish brown (2.5Y 6/4) silt loam; many fine faint yellowish brown (10YR 5/4 and 5/6) mottles; massive; friable; few faint brown (7.5YR 4/2) fillings in pores and root channels; common fine rounded concretions (iron and manganese oxides); moderately alkaline.

The thickness of the solum ranges from 50 to more than 60 inches. The Ap and E horizons have value of 4 or 5 and chroma of 1 to 3. The Bt horizon has value of 5 or 6 and chroma of 2 to 8. It ranges from strongly acid to neutral. Some pedons have a 2Bt horizon, which is clay loam or loam. The C horizon is mildly alkaline or moderately alkaline.

Keomah Series

The Keomah series consists of somewhat poorly drained, moderately slowly permeable soils on interstream divides. These soils formed in loess. Slopes range from 0 to 3 percent.

Keomah soils are similar to Clarksdale soils and commonly are adjacent to Clarksdale and Rozetta soils. Clarksdale soils have a surface layer that is darker than that of the Keomah soils. They are in landscape positions similar to those of the Keomah soils. The moderately well drained Rozetta soils are in the more sloping areas.

Typical pedon of Keomah silt loam, 0 to 3 percent slopes, 2,180 feet south and 102 feet west of the center of sec. 27, T. 13 N., R. 8 W.

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak thin platy structure parting to weak fine granular; friable; common very fine roots; neutral; abrupt smooth boundary.

E—9 to 13 inches; grayish brown (10YR 5/2) silt loam, light gray (10YR 7/2) dry; few fine prominent yellowish brown (10YR 5/6) mottles; weak thin platy structure parting to weak fine granular; friable; common very fine roots; common faint silt coatings on faces of peds, light brownish gray (10YR 6/2) dry; neutral; clear smooth boundary.

BE—13 to 17 inches; brown (10YR 5/3) silty clay loam; common fine distinct yellowish brown (10YR 5/6) mottles; weak fine subangular blocky structure; friable; common very fine roots; common faint silt coatings on faces of peds, light brownish gray (10YR 6/2) dry; strongly acid; clear smooth boundary.

Bt1—17 to 28 inches; yellowish brown (10YR 5/4) silty clay loam; common medium distinct yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; firm; common very fine roots; many faint grayish brown (10YR 5/2) clay films on faces of peds; few fine rounded concretions (iron and manganese oxides); strongly acid; clear smooth boundary.

Bt2—28 to 35 inches; yellowish brown (10YR 5/4) silty clay loam; many fine distinct yellowish brown (10YR 5/8) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; firm; common very fine roots; many distinct grayish brown (10YR 5/2) clay films on faces of peds; few fine rounded concretions (iron and manganese oxides); strongly acid; clear smooth boundary.

Bt3—35 to 47 inches; yellowish brown (10YR 5/4) silty clay loam; few fine distinct pale brown (10YR 6/3) and many medium distinct yellowish brown (10YR 5/8) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; common distinct grayish brown (10YR 5/2) clay films on faces of peds; common medium rounded concretions (iron and manganese oxides); strongly acid; clear smooth boundary.

BC—47 to 58 inches; light brownish gray (2.5Y 6/2) silty clay loam; common medium prominent yellowish brown (10YR 5/8) mottles; weak medium prismatic structure parting to weak coarse subangular blocky; friable; few very fine roots; few faint dark gray (10YR 4/1) clay films on faces of peds; strongly acid; clear smooth boundary.

C—58 to 60 inches; light brownish gray (2.5Y 6/2) silt loam; common medium prominent yellowish brown (10YR 5/8) mottles; massive; friable; few very fine roots; few faint dark gray (10YR 4/1) coatings on vertical cleavage planes; medium acid.

The thickness of the solum ranges from 50 to more than 60 inches. The Ap horizon has chroma of 1 or 2. Some pedons have an A horizon. This horizon is 1 to 3 inches thick. It has value of 3 and chroma of 2 or 3. The E horizon has value of 4 or 5 and chroma of 1 to 3. It is 3 to 9 inches thick. Some pedons have an E/B horizon. The E part of this horizon has value of 5 and chroma of 1 to 3. The B part has value of 4 or 5 and chroma of 2 to 4. The Bt horizon has hue of 10YR or 2.5Y, value of 5, and chroma of 2 to 4. It is very strongly acid or strongly acid. The C horizon is medium acid or slightly acid.

Lawson Series

The Lawson series consists of somewhat poorly drained, moderately permeable soils on bottom land. These soils formed in silty alluvium. Slopes range from 0 to 2 percent.

Lawson soils are similar to Littleton and Sawmill soils and commonly are adjacent to Arenzville, Orion, and Wakeland soils. Littleton soils have a cambic horizon. The poorly drained Sawmill soils have more clay than the Lawson soils. Arenzville, Orion, and Wakeland soils have an ochric epipedon. The moderately well drained Arenzville soils are higher on the landscape than the Lawson soils and are adjacent to the uplands. Orion and Wakeland soils are in landscape positions similar to those of the Lawson soils.

Typical pedon of Lawson silt loam, 1,060 feet north and 1,840 feet west of the southeast corner of sec. 35, T. 13 N., R. 10 W.

Ap—0 to 11 inches; black (10YR 2/1) silt loam, dark grayish brown (10YR 4/2) dry; moderate fine granular structure; friable; common very fine and fine roots; slightly acid; abrupt smooth boundary.

A1—11 to 26 inches; black (10YR 2/1) silt loam, dark grayish brown (10YR 4/2) dry; moderate fine subangular blocky structure; friable; few very fine and fine roots; slightly acid; clear smooth boundary.

A2—26 to 35 inches; very dark grayish brown (10YR 3/2) silt loam; weak medium and coarse subangular blocky structure; friable; few very fine and fine roots; common faint very dark gray (10YR 3/1) organic coatings on faces of peds; neutral; clear smooth boundary.

C—35 to 60 inches; brown (10YR 4/3) and dark grayish brown (10YR 4/2) silt loam that has strata of silty clay loam; common fine distinct dark yellowish brown (10YR 4/6) mottles; weak coarse subangular blocky structure; friable; common very dark gray (10YR 3/1) organic coatings on faces of peds; neutral.

The thickness of the mollic epipedon ranges from 30 to 40 inches. Reaction ranges from slightly acid to mildly alkaline throughout the profile. The C horizon has hue of 10YR or 2.5Y, value of 3 to 6, and chroma of 1 to 3.

Littleton Series

The Littleton series consists of somewhat poorly drained, moderately permeable soils on alluvial fans. These soils formed in silty alluvium. Slopes range from 0 to 2 percent.

Littleton soils are similar to Lawson, Tice, and Worthen soils and commonly are adjacent to Beaucoup and Worthen soils. Lawson soils do not have a cambic horizon. Tice soils have a mollic epipedon that is less than 24 inches thick. The well drained Worthen soils are on foot slopes above the Littleton soils. The poorly drained Beaucoup soils are on bottom land slightly below the Littleton soils.

Typical pedon of Littleton silt loam, 2,240 feet south and 1,240 feet west of the northeast corner of sec. 9, T. 15 N., R. 13 W.

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

A1—9 to 18 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; moderate medium granular structure; friable; neutral; clear smooth boundary.

A2—18 to 27 inches; very dark grayish brown (10YR 3/2) silt loam, dark grayish brown (10YR 4/2) dry; weak fine subangular blocky structure; friable; common faint black (10YR 2/1) organic coatings on faces of peds; few fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

BA—27 to 34 inches; dark brown (10YR 3/3) silt loam, brown (10YR 5/3) dry; weak fine subangular blocky structure; friable; common faint very dark gray (10YR 3/1) organic coatings on faces of peds; few fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

Bw—34 to 50 inches; dark grayish brown (10YR 4/2) silt loam; common medium prominent yellowish brown (10YR 5/6) and few fine prominent dark yellowish brown (10YR 4/6) mottles; moderate medium subangular blocky structure; friable; few faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; common fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

C—50 to 60 inches; light olive brown (2.5Y 5/4) silt loam; common medium prominent yellowish brown (10YR 5/8), few fine distinct dark yellowish brown (10YR 4/6), and few fine prominent light brownish gray (2.5Y 6/2) mottles; massive; friable; neutral.

The thickness of the solum ranges from 40 to 50 inches. The thickness of the mollic epipedon ranges from 24 to 40 inches.

The Ap and A horizons have value of 2 or 3 and chroma of 1 or 2. The Bw horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 2 or 3. It ranges from slightly acid to mildly alkaline.

Medway Series

The Medway series consists of moderately well drained, moderately permeable soils on bottom land and low terraces. These soils formed in loamy alluvium. Slopes range from 0 to 3 percent.

Medway soils are similar to Ambraw and Tice soils and are commonly adjacent to Ambraw, Hoopeston, and Onarga soils. Ambraw soils are poorly drained and are lower on the landscape than the Medway soils. Tice soils formed in silty alluvium. The somewhat poorly drained Hoopeston soils are on the slightly higher terraces. They have more sand and less clay in the solum than the Medway soils. The well drained Onarga soils are on slight ridges above the Medway soils.

Typical pedon of Medway loam, 0 to 3 percent slopes, 1,900 feet south and 70 feet east of the center of sec. 26, T. 15 N., R. 14 W.

Ap—0 to 9 inches; very dark gray (10YR 3/1) loam, grayish brown (10YR 5/2) dry; weak very fine granular structure; friable; few very fine roots; slightly acid; abrupt smooth boundary.

A—9 to 16 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; weak medium granular structure; friable; few very fine roots; many faint very dark gray (10YR 3/1) organic coatings on faces of peds; few fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

Bw1—16 to 22 inches; brown (10YR 4/3) loam; few fine distinct dark yellowish brown (10YR 4/6) mottles; weak fine subangular blocky structure; friable; few very fine roots; many faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; common fine rounded concretions (iron and manganese oxides); neutral; gradual smooth boundary.

Bw2—22 to 34 inches; brown (10YR 4/3) loam; common medium distinct dark yellowish brown (10YR 4/6) mottles; moderate medium subangular blocky structure; friable; few very fine roots; common faint dark brown (10YR 3/3) organic coatings on faces of peds; common fine rounded concretions (iron and manganese oxides); slightly acid; gradual smooth boundary.

Bw3—34 to 40 inches; dark yellowish brown (10YR 4/4) loam; common fine prominent yellowish brown (10YR 5/8) and few fine distinct dark yellowish brown (10YR 3/6 and 4/6) mottles; weak coarse subangular blocky structure; friable; few very fine roots; few faint brown (10YR 4/3) coatings on faces of peds; common fine rounded concretions (iron and manganese oxides); slightly acid; clear smooth boundary.

C1—40 to 51 inches; dark yellowish brown (10YR 4/4) sandy loam; common fine distinct dark yellowish brown (10YR 3/6) and yellowish brown (10YR 5/6) mottles; massive; friable; few fine roots; few faint dark grayish brown (10YR 4/2) fillings in channels; common fine rounded concretions (iron and manganese oxides); slightly acid; clear smooth boundary.

C2—51 to 60 inches; grayish brown (10YR 5/2) silty clay loam; many fine prominent yellowish brown (10YR 5/6) mottles; massive; firm; few fine accumulations (iron and manganese oxides); neutral.

The thickness of the solum ranges from 35 to 50 inches. The thickness of the mollic epipedon ranges from 10 to 20 inches.

The A horizon has value of 2 or 3 and chroma of 1 or 2. It typically is loam but in some pedons is sandy loam. The Bw horizon has hue of 10YR or 7.5YR and chroma of 2 to 4. It is loam, sandy clay loam, or clay loam. The C horizon is sandy loam, silty clay loam, loamy sand, or sand. It is slightly acid or neutral.

Onarga Series

The Onarga series consists of well drained soils on terrace ridges. These soils formed in wind- and water-deposited, loamy and sandy material. Permeability is moderate in the upper part of the profile and rapid in the lower part. Slopes range from 1 to 5 percent.

Onarga soils are similar to Alvin and Dickinson soils and commonly are adjacent to Dickinson and Sparta soils. Alvin soils have an ochric epipedon. Dickinson soils do not have an argillic horizon. They are in the less sloping areas. The excessively drained Sparta soils are sandy. They are in landscape positions similar to those of the Onarga soils.

Typical pedon of Qnarga fine sandy loam, 1 to 5 percent slopes, 340 feet south and 20 feet west of the northeast corner of sec. 19, T. 15 N., R. 13 W.

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

A—9 to 16 inches; very dark grayish brown (10YR 3/2) fine sandy loam, dark grayish brown (10YR 4/2) dry; moderate fine granular structure; very friable; few very fine roots; medium acid; clear smooth boundary.

BA—16 to 23 inches; brown (10YR 4/3) sandy loam; weak medium subangular blocky structure; friable; few fine roots; common faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; medium acid; clear smooth boundary.

Bt—23 to 30 inches; brown (10YR 4/3) sandy loam; moderate medium subangular blocky structure; firm; few faint very dark grayish brown (10YR 3/2) clay films on faces of peds; medium acid; clear smooth boundary.

BC—30 to 37 inches; dark yellowish brown (10YR 4/4) sandy loam; weak medium subangular blocky structure; friable; few faint dark brown (10YR 3/3) organic coatings on faces of peds; medium acid; clear smooth boundary.

C—37 to 60 inches; brown (7.5YR 4/4) and dark yellowish brown (10YR 4/6) stratified loamy sand, sandy loam, and sand; single grained; loose; medium acid.

The thickness of the solum ranges from 35 to 50 inches. The thickness of the mollic epipedon ranges from 10 to 18 inches.

The Ap horizon has value of 2 or 3 and chroma of 1 or 2. The Bt and C horizons are strongly acid to slightly acid. The Bt horizon has value of 4 or 5 and chroma of 3 to 6. In some pedons it has a layer of sandy clay loam less than 5 inches thick. The C horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6.

Orio Series

The Orio series consists of poorly drained, moderately slowly permeable soils in slight depressions on terraces. These soils formed in sandy and loamy alluvium. Slopes range from 0 to 2 percent.

Orio soils commonly are adjacent to Hoopeston and Plainfield soils. The somewhat poorly drained Hoopeston soils are in the higher areas surrounding the Orio soils. The excessively drained Plainfield soils are on terrace ridges and side slopes above the Orio soils.

Typical pedon of Orio sandy loam, 200 feet north and 1,860 feet west of the southeast corner of sec. 10, T. 13 N., R. 13 W.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) sandy loam, grayish brown (10YR 5/2) dry; weak fine granular structure; very friable; common fine and medium roots; neutral; abrupt smooth boundary.

E1—9 to 16 inches; dark grayish brown (10YR 4/2) sandy loam; few fine prominent dark yellowish brown (10YR 4/6) mottles; weak medium platy structure; very friable; common very fine and fine roots; very dark grayish brown (10YR 3/2) organic stains on faces of peds; neutral; clear smooth boundary.

E2—16 to 25 inches; grayish brown (2.5Y 5/2) sandy loam; common fine distinct brown (10YR 5/3) and prominent yellowish brown (10YR 5/4) and dark yellowish brown (10YR 4/6) mottles; weak medium platy structure; very friable; very dark grayish brown (10YR 3/2) and dark grayish brown (10YR 4/2) organic stains on faces of peds; neutral; clear smooth boundary.

BE—25 to 31 inches; grayish brown (2.5Y 5/2) sandy clay loam; common medium prominent dark yellowish brown (10YR 4/6) and yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; firm; neutral; clear smooth boundary.

Bt1—31 to 37 inches; grayish brown (2.5Y 5/2) clay loam; common medium prominent dark yellowish brown (10YR 4/6) mottles; moderate medium subangular blocky structure; firm; common faint gray (10YR 5/1) clay films on faces of peds; neutral; clear smooth boundary.

Bt2—37 to 43 inches; grayish brown (2.5Y 5/2) sandy clay loam; common medium prominent dark yellowish brown (10YR 4/6) mottles; moderate medium subangular blocky structure; firm; few faint dark grayish brown (2.5Y 4/2) clay films on faces of peds; few pebbles; neutral; clear smooth boundary.

BC—43 to 54 inches; light brownish gray (2.5Y 6/2) sandy clay loam; common coarse prominent dark yellowish brown (10YR 4/6) and yellowish brown (10YR 5/8) and few coarse prominent brown (7.5YR 4/4) mottles; weak medium subangular blocky structure; firm; neutral; clear smooth boundary.

C—54 to 60 inches; brown (10YR 5/3) stratified sandy loam and sandy clay loam; common medium distinct dark yellowish brown (10YR 3/6 and 4/6) mottles; massive; friable; neutral.

The thickness of the solum ranges from 35 to 55 inches. The Ap and E horizons are sandy loam, loam, or loamy sand. The Ap horizon has value of 2 or 3 and chroma of 1 to 3. The E horizon is 12 to 18 inches thick. The E and Bt horizons have hue of 2.5Y, 5Y, or 10YR, value of 4 to 6, and chroma of 1 or 2. The Bt horizon is clay loam, sandy clay loam, or sandy loam. It ranges from medium acid to neutral. The C horizon is stratified loamy sand, sand, sandy clay loam, or loam. It ranges from medium acid to mildly alkaline.

Orion Series

The Orion series consists of somewhat poorly drained, moderately permeable soils on bottom land. These soils formed in silty alluvium 20 to 40 inches deep over a dark, silty buried soil. Slopes range from 0 to 2 percent.

Orion soils are similar to Arenzville, Dupo, and Wakeland soils and commonly are adjacent to Arenzville, Lawson, and Wakeland soils. The moderately well drained Arenzville soils are higher on the landscape than the Orion soils and are adjacent to the uplands. Dupo soils have a clayey buried soil. Lawson and Wakeland soils are in landscape positions similar to those of the Orion soils. Lawson soils have a mollic epipedon. Wakeland soils do not have a dark buried soil.

Typical pedon of Orion silt loam, 1,360 feet south and 1,060 feet east of the northwest corner of sec. 8, T. 16 N., R. 10 W.

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

A1—5 to 10 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; moderate fine granular structure; friable; many very fine and fine roots; few faint dark brown (10YR 3/3) organic coatings on faces of peds; neutral; clear smooth boundary.

A2—10 to 16 inches; brown (10YR 4/3) silt loam; many medium faint dark grayish brown (10YR 4/2) and few medium distinct yellowish brown (10YR 5/6) mottles; moderate fine subangular blocky structure; friable; many very fine roots; neutral; clear smooth boundary.

C1—16 to 27 inches; brown (10YR 5/3) and dark grayish brown (10YR 4/2) silt loam; massive; medium bedding planes; friable; many very fine roots; yellowish brown (10YR 5/8) iron stains around root pores; neutral; clear smooth boundary.

C2—27 to 32 inches; stratified dark grayish brown (10YR 4/2) and brown (10YR 5/3) silt loam; many medium distinct yellowish brown (10YR 5/8) mottles; massive; medium bedding planes; friable; many very fine roots; few medium rounded concretions (iron and manganese oxides); neutral; abrupt smooth boundary.

Ab1—32 to 45 inches; black (10YR 2/1) silt loam; common fine prominent yellowish brown (10YR 5/8) mottles; moderate fine subangular blocky structure; friable; common very fine roots; neutral; clear smooth boundary.

Ab2—45 to 56 inches; very dark grayish brown (10YR 3/2) silt loam; many fine prominent yellowish brown (10YR 5/6) mottles; weak medium and fine subangular blocky structure; friable; few very fine roots; neutral; clear smooth boundary.

Ab3—56 to 60 inches; very dark grayish brown (10YR 3/2) silty clay loam; many fine prominent yellowish brown (10YR 5/6) mottles; massive; firm; few very fine roots; neutral.

The depth to the Ab horizon ranges from 20 to 40 inches. The Ap horizon has value of 3 to 5 and chroma of 1 to 3. Where the Ap horizon has value of 3 and chroma of 1 or 2, it is less than 6 inches thick. The C and Ab horizons range from medium acid to mildly alkaline. The C horizon has value of 4 or 5 and chroma of 2 or 3. It is dominantly silt loam but has thin strata of very fine sand in some pedons. The Ab horizon is silt loam or silty clay loam.

Petrolia Series

The Petrolia series consists of poorly drained, moderately slowly permeable soils on bottom land. These soils formed in silty alluvium. Slopes range from 0 to 2 percent.

These soils have higher chroma in the control section than is definitive for the Petrolia series. This difference, however, does not significantly affect the usefulness or behavior of the soils.

Petrolia soils commonly are adjacent to the Darwin soils. The very poorly drained Darwin soils are lower on the bottom land than the Petrolia soils. They have a mollic epipedon and are clayey.

Typical pedon of Petrolia silt loam, 1,320 feet west and 1,800 feet north of the southeast corner of sec. 29, T. 13 N., R. 13 W.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) and brown (10YR 5/3) silt loam, pale brown (10YR 6/3) and brown (10YR 5/3) dry; weak fine granular structure; friable; few very fine roots; few faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; slightly acid; abrupt smooth boundary.

Cg1—7 to 20 inches; dark grayish brown (10YR 4/2) silty clay loam; common fine distinct dark yellowish brown (10YR 4/4) mottles; weak medium subangular blocky structure; firm; few very fine roots; few faint dark gray (10YR 4/1) exteriors of peds; few very dark grayish brown (10YR 3/2) organic coatings on faces of peds in the upper part; few fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

Cg2—20 to 39 inches; dark grayish brown (10YR 4/2) silty clay loam; common fine distinct dark yellowish brown (10YR 3/4) mottles; weak medium prismatic structure parting to weak medium subangular blocky; firm; few very fine roots; common faint dark gray (10YR 4/1) exteriors of peds; few fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

Cg3—39 to 60 inches; dark grayish brown (10YR 4/2) silty clay loam; few fine prominent dark yellowish brown (10YR 4/6) and common medium distinct dark yellowish brown (10YR 4/4) mottles; weak medium subangular blocky structure; firm; common faint dark gray (10YR 4/1) exteriors of peds; common fine rounded concretions (iron and manganese oxides); neutral.

The Ap horizon has value of 4 or 5 and chroma of 2 or 3. The Cg horizon is neutral or mildly alkaline.

Plainfield Series

The Plainfield series consists of excessively drained, rapidly permeable soils on ridgetops and side slopes on terraces and uplands. These soils formed in windblown, sandy material. Slopes range from 2 to 15 percent.

Plainfield soils are similar to Bloomfield soils and commonly are adjacent to Sparta and Watseka soils. Bloomfield soils have lamellae in the subsoil. Sparta soils have a mollic epipedon. They are in the less sloping areas. The somewhat poorly drained Watseka soils are at the base of terraces, in areas below the Plainfield soils.

Typical pedon of Plainfield loamy sand, 2 to 7 percent slopes, 685 feet south and 935 feet west of the center of sec. 27, T. 14 N., R. 13 W.

Ap—0 to 9 inches; dark brown (10YR 4/3) loamy sand, brown (10YR 5/3) dry; weak medium granular structure; loose; many very fine roots; few fragments of dark yellowish brown (10YR 4/4) subsoil material; strongly acid; abrupt smooth boundary.

Bw—9 to 17 inches; dark yellowish brown (10YR 4/4) sand; single grained; massive; loose; few very fine roots; strongly acid; clear smooth boundary.

C1—17 to 37 inches; yellowish brown (10YR 5/6) sand; single grained; loose; few very fine roots; strongly acid; clear smooth boundary.

C2—37 to 60 inches; yellowish brown (10YR 5/8) sand; single grained; loose; few very fine roots; very strongly acid.

The Ap horizon has value of 3 or 4 and chroma of 1 to 3. The Bw and C horizons range from very strongly acid to slightly acid. The Bw horizon has value of 4 or 5 and chroma of 3 to 6. The C horizon has value of 5 to 7 and chroma of 4 to 8.

Ross Series

The Ross series consists of well drained, moderately permeable soils on low terraces. These soils formed in loamy alluvium. Slopes range from 0 to 3 percent.

These soils have a thinner mollic epipedon and a thicker solum than is definitive for the Ross series. These differences, however, do not significantly affect the usefulness or behavior of the soils.

Ross soils are similar to Worthen soils and commonly are adjacent to the frequently flooded Beaucoup soils. Worthen soils contain less sand than the Ross soils. The poorly drained Beaucoup soils are lower on the landscape than the Ross soils. They are silty.

Typical pedon of Ross loam, 0 to 3 percent slopes, 1,000 feet west and 50 feet south of the northeast corner of sec. 4, T. 16 N., R. 13 W.

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; common fine roots; very dark gray (10YR 3/1) organic coatings on faces of peds; neutral; abrupt smooth boundary.

A1—7 to 12 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; few fine roots; few fine dark yellowish brown (10YR 3/6) stains (iron and manganese oxides); neutral; clear smooth boundary.

A2—12 to 16 inches; dark brown (10YR 3/3) loam, brown (10YR 5/3) dry; weak fine subangular blocky structure; friable; few fine roots; many faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

Bw1—16 to 28 inches; brown (10YR 4/3) loam; weak medium subangular blocky structure; friable; few fine roots; common faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; common fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

Bw2—28 to 36 inches; dark yellowish brown (10YR 4/4) loam; few fine faint dark yellowish brown (10YR 4/6) mottles; weak coarse subangular blocky structure; friable; few fine roots; few faint brown (10YR 4/3) organic coatings on faces of peds; common fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

BC—36 to 47 inches; dark yellowish brown (10YR 4/4) sandy loam; few fine faint yellowish brown (10YR 5/4) mottles; weak coarse subangular blocky structure; friable; few faint brown (10YR 4/3) organic coatings on faces of peds; neutral; clear smooth boundary.

C—47 to 60 inches; dark yellowish brown (10YR 4/4) loamy sand; few fine faint yellowish brown (10YR 5/4) mottles; massive; loose; few faint brown (10YR 4/3) organic coatings on sand grains; neutral.

The thickness of the solum ranges from 45 to 55 inches. The mollic epipedon is 15 to 20 inches thick.

The A horizon has value of 2 or 3 and chroma of 1 to 3. It is loam, silt loam, or silty clay loam. The Bw and C horizons are slightly acid or neutral. The Bw horizon has value of 4 or 5. It is commonly loam, but in some pedons it has subhorizons of clay loam. The C horizon is sandy loam, loamy sand, loam, or sandy clay loam.

Rozetta Series

The Rozetta series consists of moderately well drained, moderately permeable soils on ridgetops and side slopes in the uplands. These soils formed in loess. Slopes range from 2 to 10 percent.

Rozetta soils are similar to Elco and Fayette soils and commonly are adjacent to Hickory, Keomah, and Sylvan soils. Elco soils formed in 20 to 40 inches of loess and in pedisediment. Fayette, Hickory, and Sylvan soils are well drained. Hickory soils formed in glacial till on the steeper slopes. Sylvan soils have free carbonates within a depth of 40 inches. They are in the steeper areas. The somewhat poorly drained Keomah soils have a higher content of clay in the subsoil than the Rozetta soils. They are in the less sloping areas.

Typical pedon of Rozetta silt loam, 2 to 5 percent slopes, 1,460 feet east and 700 feet south of the northwest corner of sec. 12, T. 16 N., R. 11 W.

Ap—0 to 7 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine granular structure; friable; few very fine and fine roots; few fine rounded concretions (iron and manganese oxides); neutral; abrupt smooth boundary.

E—7 to 11 inches; brown (10YR 4/3) silt loam; moderate medium platy structure; friable; few very fine roots;

few fine rounded concretions (iron and manganese oxides); medium acid; abrupt smooth boundary.

Bt1—11 to 15 inches; dark yellowish brown (10YR 4/4) silt loam; moderate fine subangular blocky structure; friable; few very fine roots; few faint brown (10YR 4/3) clay films on faces of peds; few fine rounded concretions (iron and manganese oxides); strongly acid; clear smooth boundary.

Bt2—15 to 22 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine prismatic structure parting to moderate fine and medium subangular blocky; firm; few very fine roots; common faint brown (10YR 4/3) clay films on faces of peds; common fine rounded concretions (iron and manganese oxides); medium acid; clear smooth boundary.

Bt3—22 to 29 inches; yellowish brown (10YR 5/4) silty clay loam; few fine faint light yellowish brown (10YR 6/4) and dark yellowish brown (10YR 4/6) and common fine faint yellowish brown (10YR 5/6) mottles; moderate fine prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; common fine rounded concretions (iron and manganese oxides); medium acid; clear smooth boundary.

Bt4—29 to 39 inches; yellowish brown (10YR 5/4) silty clay loam; common fine distinct pale brown (10YR 6/3), yellowish brown (10YR 5/8), and dark yellowish brown (10YR 4/6) mottles; moderate fine and medium prismatic structure parting to moderate medium subangular blocky; firm; common faint brown (10YR 4/3) clay films on faces of peds; common fine and medium rounded concretions (iron and manganese oxides); medium acid; clear smooth boundary.

BC—39 to 54 inches; yellowish brown (10YR 5/4) silt loam; few fine distinct dark yellowish brown (10YR 4/6) and common fine and medium faint yellowish brown (10YR 5/6) mottles; weak medium and coarse subangular blocky structure; friable; few faint brown (10YR 4/3) fillings in channels; common fine and medium rounded concretions (iron and manganese oxides); medium acid; clear smooth boundary.

C—54 to 60 inches; yellowish brown (10YR 5/4) silt loam; common fine distinct yellowish brown (10YR 5/8) mottles; massive; friable; few faint brown (10YR 4/3) fillings in channels; few fine rounded concretions (iron and manganese oxides); medium acid.

The thickness of the solum ranges from 43 to more than 60 inches. The Ap horizon has value of 3 to 5 and chroma of 2 or 3. It is commonly silt loam but is silty clay loam in severely eroded areas. Pedons in uncultivated areas have an A horizon. This horizon is less than 6 inches thick. It has value of 3 and chroma of 1 or 2. The Bt horizon has value of 4 or 5 and chroma of 3 or 4. It is strongly acid or medium acid. The C horizon ranges from medium acid to mildly alkaline.

Sable Series

The Sable series consists of poorly drained, moderately permeable soils on upland flats. These soils formed in loess. Slopes range from 0 to 2 percent.

Sable soils are similar to Hartsburg and Virden soils and commonly are adjacent to Ipava and Tama soils. Hartsburg soils have carbonates within a depth of 40 inches. Virden soils have more clay in the subsoil than the Sable soils. They have an argillic horizon. The somewhat poorly drained Ipava and moderately well drained Tama soils are in the more sloping areas above the Sable soils.

Typical pedon of Sable silty clay loam, 1,860 feet west and 1,150 feet south of the northeast corner of sec. 18, T. 16 N., R. 8 W.

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

A—9 to 17 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; common fine prominent dark yellowish brown (10YR 4/6) mottles; strong medium granular structure; firm; common very fine roots; few medium rounded concretions (iron and manganese oxides); slightly acid; clear smooth boundary.

Bg1—17 to 22 inches; dark grayish brown (2.5Y 4/2) silty clay loam; common fine distinct dark yellowish brown (10YR 4/4 and 4/6) mottles; moderate medium subangular blocky structure; firm; common very fine roots; many faint very dark gray (10YR 3/1) organic coatings on faces of peds; common fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

Bg2—22 to 29 inches; dark grayish brown (2.5Y 4/2) silty clay loam; common medium prominent yellowish brown (10YR 5/8) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine and fine roots; common faint very dark gray (10YR 3/1) organic coatings on faces of peds; common fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

Bg3—29 to 38 inches; grayish brown (2.5Y 5/2) silty clay loam; common medium prominent yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; friable; few very fine roots; few faint very dark gray (10YR 3/1) organic coatings and common faint dark grayish brown (2.5Y 4/2) clay films on faces of peds; common fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

BC—38 to 42 inches; light yellowish brown (2.5Y 6/4) silt loam; common medium distinct light olive brown (2.5Y 5/6) and few fine faint light brownish gray (2.5Y 6/2) mottles; weak coarse subangular blocky structure; friable; few fine rounded concretions (iron and manganese oxides); mildly alkaline; clear smooth boundary.

Cg—42 to 60 inches; light brownish gray (10YR 6/2) silt loam; common fine prominent yellowish brown (10YR 5/6 and 5/8) mottles; massive; friable; common faint dark gray (10YR 4/1) fillings in channels; slight effervescence; mildly alkaline.

The thickness of the solum ranges from 40 to 55 inches. The depth to free carbonates ranges from 35 to 60 inches. The mollic epipedon is 12 to 24 inches thick.

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. It is slightly acid to mildly alkaline.

Sawmill Series

The Sawmill series consists of poorly drained, moderately permeable soils on bottom land. These soils formed in silty alluvium. Slopes range from 0 to 2 percent.

Sawmill soils are similar to Lawson soils and commonly are adjacent to the somewhat poorly drained Lawson and Orion soils. The adjacent soils are higher on the bottom land than the Sawmill soils. Also, Orion soils have light colored, silty alluvium 20 to 40 inches deep over a silty buried soil.

Typical pedon of Sawmill silty clay loam, 2,440 feet south and 460 feet east of the northwest corner of sec. 18, T. 16 N., R. 11 W.

Ap—0 to 5 inches; very dark grayish brown (10YR 3/2) silty clay loam, dark grayish brown (10YR 4/2) dry; weak fine granular structure; firm; few very fine and fine roots; neutral; abrupt smooth boundary.

A1—5 to 14 inches; very dark grayish brown (10YR 3/2) silty clay loam, dark gray (10YR 4/1) dry; few fine prominent dark yellowish brown (10YR 4/6) and few fine faint grayish brown (10YR 5/2) mottles; moderate fine and medium subangular blocky structure; firm; few very fine and fine roots; few faint very dark gray (10YR 3/1) organic coatings on faces of peds; neutral; clear smooth boundary.

A2—14 to 26 inches; very dark gray (10YR 3/1) silty clay loam, dark gray (10YR 4/1) dry; few fine faint grayish brown (10YR 5/2) mottles; moderate fine subangular blocky structure; firm; few very fine roots; few fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

BA—26 to 33 inches; very dark gray (10YR 3/1) silty clay loam, dark grayish brown (10YR 4/2) dry; few fine prominent dark yellowish brown (10YR 4/6) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; few fine rounded concretions (iron and manganese oxides); slightly acid; clear smooth boundary.

Bg—33 to 43 inches; dark grayish brown (2.5Y 4/2) silty clay loam; common fine prominent light olive brown (2.5Y 5/4), few fine distinct olive brown (2.5Y 4/4), and few fine prominent dark yellowish brown (10YR 4/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; few faint very dark gray (10YR 3/1) clay films on faces of peds; common fine and few medium rounded concretions (iron and manganese oxides); slightly acid; clear smooth boundary.

BCg—43 to 48 inches; grayish brown (2.5Y 5/2) silty clay loam; common fine prominent dark yellowish brown (10YR 4/6) mottles; weak coarse subangular blocky structure; firm; few faint very dark grayish brown (10YR 3/2) fillings in channels; few fine and medium rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

Cg—48 to 60 inches; grayish brown (2.5Y 5/2) silty clay loam; many medium prominent yellowish brown (10YR 5/8) and brownish yellow (10YR 6/8) mottles; massive; firm; few faint very dark grayish brown (10YR 3/2) fillings in channels; few fine and medium rounded concretions (iron and manganese oxides); neutral.

The thickness of the solum ranges from 36 to 60 inches. The thickness of the mollic epipedon ranges from 24 to 36 inches. Some pedons have as much as 20 inches of silt loam overwash.

The A horizon has hue of 10YR or 2.5Y 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, 2.5Y, or 5Y, value of 4 to 6, and chroma of 1 or 2. In some pedons it is clay loam or loam in the lower part. It is slightly acid to mildly alkaline. The C horizon is silty clay loam, silt loam, or clay loam. In some pedons it has sandier strata. It is neutral or mildly alkaline.

Sparta Series

The Sparta series consists of excessively drained soils on terraces. These soils formed in windblown, sandy material. They generally are rapidly permeable throughout. The loamy substratum phase, however, is moderately permeable in the substratum. Slopes range from 0 to 6 percent.

Sparta soils are commonly adjacent to Hoopeston, Onarga, and Plainfield soils. The somewhat poorly drained Hoopeston soils are on broad, low terraces below the Sparta soils. They have a higher content of clay in the control section than the Sparta soils. Onarga and Plainfield soils are in landscape positions similar to those of the Sparta soils. The well drained Onarga soils have a higher content of clay in the subsoil than the Sparta soils. Plainfield soils do not have a mollic epipedon.

Typical pedon of Sparta loamy sand, 1 to 6 percent slopes, 2,640 feet south and 480 feet west of the northeast corner of sec. 4, T. 15 N., R. 13 W.

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) loamy sand, brown (10YR 4/3) dry; weak fine granular structure; very friable; common fine roots; strongly acid; abrupt smooth boundary.

AB—8 to 18 inches; dark brown (10YR 3/3) loamy sand, brown (10YR 4/3) dry; massive; very friable; strongly acid; gradual smooth boundary.

Bw—18 to 28 inches; brown (10YR 4/3) loamy sand; single grained; loose; medium acid; gradual smooth boundary.

BC—28 to 37 inches; dark yellowish brown (10YR 4/4) loamy sand; single grained; loose; medium acid; gradual smooth boundary.

C—37 to 60 inches; dark yellowish brown (10YR 4/6) sand; single grained; loose; medium acid.

The thickness of the solum ranges from 24 to 40 inches. The thickness of the mollic epipedon ranges from 12 to 24 inches.

The Bw horizon has hue of 10YR or 7.5YR and value and chroma of 3 to 6. It is strongly acid or medium acid. The C horizon is typically sand, but in the loamy substratum phase it is stratified sandy loam, loam, or clay loam in the lower part. It is medium acid or slightly acid.

Sylvan Series

The Sylvan series consists of well drained, moderately permeable soils on side slopes in the uplands. These soils formed in loess. Slopes range from 5 to 30 percent.

Sylvan soils are similar to Fayette soils and commonly are adjacent to Bold and Fayette soils. Fayette soils do not have free carbonates within a depth of 40 inches. They are in landscape positions similar to those of the Sylvan soils. Bold soils have free carbonates throughout and do not have subsoil development. They are lower on the side slopes than the Sylvan soils.

Typical pedon of Sylvan silty clay loam, 15 to 30 percent slopes, severely eroded, 1,847 feet south and 193 feet east of the northwest corner of sec. 9, T. 16 N., R. 10 W.

Ap—0 to 6 inches; dark yellowish brown (10YR 4/4) silty clay loam, brownish yellow (10YR 6/6) dry; strong medium angular blocky structure; firm; common very fine roots; medium acid; abrupt smooth boundary.

Bt1—6 to 11 inches; yellowish brown (10YR 5/6) silty clay loam; moderate fine subangular blocky structure; firm; common very fine roots; common faint dark yellowish brown (10YR 4/4) clay films on faces of peds; medium acid; clear smooth boundary.

Bt2—11 to 18 inches; yellowish brown (10YR 5/6) silty clay loam; moderate medium subangular blocky structure; firm; very few fine roots; common faint dark yellowish brown (10YR 4/4) clay films on faces of peds; medium acid; clear smooth boundary.

Bt3—18 to 25 inches; yellowish brown (10YR 5/6) silty clay loam; common fine distinct yellowish brown (10YR 5/8) and light yellowish brown (10YR 6/4) mottles; weak coarse subangular blocky structure; friable; few very fine roots; few faint brown (10YR 4/3) clay films on faces of peds; slightly acid; clear smooth boundary.

C1—25 to 33 inches; yellowish brown (10YR 5/4) silt loam; common medium distinct yellowish brown (10YR 5/8) mottles; weak medium platy structure; friable; few fine rounded concretions (iron and manganese oxides); slight effervescence; neutral; gradual smooth boundary.

C2—33 to 49 inches; light brownish gray (2.5Y 6/2) silt loam; many medium prominent yellowish brown (10YR 5/8) mottles; weak medium platy structure; friable; few fine rounded concretions (iron and manganese oxides); strong effervescence; mildly alkaline; gradual smooth boundary.

C3—49 to 60 inches; light brownish gray (2.5Y 6/2) silt loam; common medium distinct yellowish brown (10YR 5/8) mottles; weak medium platy structure; friable; strong effervescence; mildly alkaline.

The thickness of the solum ranges from 22 to 35 inches. The depth to free carbonates ranges from 20 to 40 inches.

The Ap horizon has value of 4 or 5 and chroma of 2 to 4. It is commonly silty clay loam but is silt loam in the less eroded areas. The Bt horizon has value of 4 or 5 and chroma of 4 to 6. It is medium acid to neutral. The C horizon is neutral to moderately alkaline.

Tama Series

The Tama series consists of moderately well drained, moderately permeable soils on ridges and side slopes in the uplands. These soils formed in loess. Slopes range from 2 to 10 percent.

Tama soils are similar to Assumption and Elkhart soils and commonly are adjacent to Assumption, Elkhart, and Ipava soils. Assumption and Elkhart soils are on side slopes. Assumption soils have a paleosol within a depth of 40 inches. Elkhart soils have free carbonates within a depth of 40 inches. The somewhat poorly drained Ipava soils are in the less sloping areas below the Tama soils.

Typical pedon of Tama silt loam, 2 to 5 percent slopes, 1,600 feet north and 1,240 feet east of the center of sec. 26, T. 13 N., R. 8 W.

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

BA—14 to 20 inches; brown (10YR 4/3) silty clay loam; weak fine prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots; common faint very dark gray (10YR 3/1) organic coatings on faces of peds; medium acid; clear smooth boundary.

Bt1—20 to 27 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak fine prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; common faint dark brown (10YR 3/3) clay films on faces of peds; medium acid; clear smooth boundary.

Bt2—27 to 40 inches; dark yellowish brown (10YR 4/4) silty clay loam; common fine distinct dark yellowish brown (10YR 4/6) and yellowish brown (10YR 5/8) and few fine faint brown (10YR 5/3) mottles; weak fine prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; common faint brown (10YR 4/3) clay films on faces of peds; common fine rounded concretions (iron and manganese oxides); strongly acid; clear smooth boundary.

Bt3—40 to 55 inches; dark yellowish brown (10YR 4/4) silty clay loam; common medium distinct yellowish brown (10YR 5/8) and few fine faint brown (10YR 5/3) mottles; moderate medium subangular blocky structure; friable; few very fine roots; few faint brown (10YR 4/3) clay films on faces of peds; common fine rounded concretions (iron and manganese oxides); medium acid; clear smooth boundary.

BC—55 to 60 inches; yellowish brown (10YR 5/6) silt loam; common medium distinct yellowish brown (10YR 5/8) and brown (10YR 5/3) mottles; weak coarse subangular blocky structure; friable; few faint dark grayish brown (10YR 4/2) clay films on faces of peds; common fine rounded concretions (iron and manganese oxides); medium acid.

The thickness of the solum ranges from 43 to more than 60 inches. The thickness of the mollic epipedon ranges from 11 to 18 inches.

The Ap horizon has chroma of 1 to 3. The Bt horizon has value of 4 or 5 and chroma of 3 to 6. It ranges from strongly acid to neutral. Some pedons have a C horizon within a depth of 60 inches. This horizon is silt loam. It is medium acid to neutral.

Tama silt loam, 5 to 10 percent slopes, eroded, is a taxadjunct to the Tama series because the surface soil does not meet the thickness requirement for a mollic epipedon. Also, the subsoil is higher in reaction than is definitive for the series. These differences, however, do not significantly affect the usefulness or behavior of the soil.

Tice Series

The Tice series consists of somewhat poorly drained, moderately permeable soils on bottom land. These soils formed in silty alluvium. Slopes range from 0 to 2 percent.

Tice soils are similar to Littleton and Medway soils and commonly are adjacent to Beaucoup, Littleton, and Medway soils. Littleton soils have a mollic epipedon that is more than 24 inches thick. They are on alluvial fans and are nearer to the uplands than the Tice soils. Medway soils have a higher content of sand throughout than the Tice soils. They are on low terraces above the Tice soils. The poorly drained Beaucoup soils are on the lower parts of the bottom land.

Typical pedon of Tice silt loam, 1,777 feet north and 200 feet east of the center of sec. 2, T. 16 N., R. 13 W.

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

Bw1—10 to 18 inches; brown (10YR 4/3) silty clay loam; few fine distinct yellowish brown (10YR 5/6) mottles; weak fine subangular blocky structure; friable; few very fine roots; common faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; common fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

Bw2—18 to 28 inches; brown (10YR 4/3) silty clay loam; common fine distinct dark yellowish brown (10YR 4/6 and 4/4) mottles; moderate medium subangular blocky structure; firm; few very fine roots; common faint dark grayish brown (10YR 4/2) coatings on faces of peds; many medium rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

Bw3—28 to 37 inches; dark grayish brown (2.5Y 4/2) silty clay loam; many medium prominent dark yellowish brown (10YR 4/6) and yellowish brown (10YR 5/8) mottles; weak fine prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; common faint grayish brown (10YR 5/2) coatings on faces of peds; many medium rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

BC—37 to 49 inches; grayish brown (10YR 5/2) silt loam; many coarse prominent yellowish brown (10YR 5/8) and many medium prominent dark yellowish brown (10YR 4/6) mottles; weak coarse subangular blocky structure; firm; few faint dark grayish brown (2.5Y 4/2) fillings in channels; many medium rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

C—49 to 60 inches; light brownish gray (10YR 6/2) silt loam; many medium prominent yellowish brown (10YR 5/8) mottles; massive; friable; very few faint brown (10YR 5/3) and very dark grayish brown (10YR 3/2) coatings on cleavage planes; common fine rounded concretions (iron and manganese oxides); mildly alkaline.

The thickness of the solum ranges from 45 to 60 inches. The mollic epipedon is 10 to 15 inches thick.

The Ap horizon has chroma of 2 or 3. It is silt loam or silty clay loam. The Bw horizon has value of 4 or 5. It is slightly acid or neutral. The C horizon is commonly silt loam but in some pedons is sandy loam. It is neutral or mildly alkaline.

Ursa Series

The Ursa series consists of well drained, slowly permeable soils on side slopes in the uplands. These soils formed in less than 20 inches of loess and in the underlying paleosol, which formed in glacial till. Slopes range from 10 to 30 percent.

Ursa soils commonly are adjacent to Elco, Hickory, and Rozetta soils. Elco soils have 20 to 40 inches of loess and are underlain by a paleosol. They are on side slopes above the Ursa soils. Hickory soils have less clay in the subsoil than the Ursa soils. They are on side slopes below the Ursa soils. Rozetta soils formed in loess on ridges above the Ursa soils.

Typical pedon of Ursa silt loam, in an area of Elco-Ursa silt loams, 15 to 30 percent slopes, eroded, 2,020 feet north and 260 feet west of the center of sec. 34, T. 13 N., R. 8 W.

Ap—0 to 6 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; mixed with yellowish brown (10YR 5/6) subsoil material; weak fine granular structure; friable; many very fine and fine roots; few faint dark brown (10YR 3/3) organic coatings on faces of peds; strongly acid; abrupt smooth boundary.

2Bt1—6 to 14 inches; yellowish brown (10YR 5/6) silty clay; moderate fine subangular blocky structure; firm; common very fine roots; common faint brown (10YR 4/3) clay films on faces of peds; few fine rounded concretions (iron and manganese oxides); very strongly acid; clear smooth boundary.

2Bt2—14 to 25 inches; yellowish brown (10YR 5/8) silty clay; common medium prominent pale brown (10YR 6/3) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; common distinct brown (10YR 5/3) clay films on faces of peds; common fine rounded concretions (iron and manganese oxides); very strongly acid; clear smooth boundary.

2Bt3—25 to 31 inches; yellowish brown (10YR 5/8) clay loam; common medium prominent grayish brown (10YR 5/2) and few fine faint brownish yellow (10YR 6/8) mottles; weak coarse subangular blocky structure; firm; few very fine roots; common distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; many fine rounded concretions (iron and manganese oxides); few pebbles; strongly acid; clear smooth boundary.

2Btg—31 to 51 inches; grayish brown (10YR 5/2) clay loam; many coarse prominent yellowish brown (10YR 5/8) and common medium distinct dark yellowish brown (10YR 4/4) mottles; weak coarse subangular blocky structure; firm; common faint gray (10YR 5/1) clay films on faces of peds; many medium rounded concretions (iron and manganese oxides); few pebbles; slightly acid; gradual smooth boundary.

2BCg—51 to 60 inches; grayish brown (10YR 5/2) clay loam; many coarse prominent yellowish brown (10YR 5/8) and many medium prominent dark yellowish brown (10YR 4/6) mottles; weak coarse subangular blocky structure; firm; many medium rounded concretions (iron and manganese oxides); few pebbles; mildly alkaline.

The Ap horizon has value of 4 and chroma of 1 to 3. The 2Bt horizon has hue of 10YR or 5Y and value of 4 or 5.

Virden Series

The Virden series consists of poorly drained, moderately slowly permeable soils on broad upland flats. These soils formed in loess. Slopes range from 0 to 2 percent.

Virden soils are similar to Sable soils and commonly are adjacent to Ipava and Keomah soils. Sable soils have less clay in the control section than the Virden soils and do not have an argillic horizon. The somewhat poorly drained Ipava and Keomah soils are higher on the landscape than the Virden soils. Also, Keomah soils have an ochric epipedon.

Typical pedon of Virden silty clay loam, 1,150 feet south and 45 feet west of the northeast corner of sec. 32, T. 13 N., R. 9 W.

Ap—0 to 8 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; weak fine granular structure; friable; many very fine roots; neutral; abrupt smooth boundary.

A—8 to 18 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate medium and fine subangular blocky structure; firm; many very fine roots; few fine rounded concretions (iron and manganese oxides); slightly acid; clear smooth boundary.

Bt—18 to 23 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; few fine prominent yellowish brown (10YR 5/6) mottles; moderate and strong medium subangular blocky structure; firm; many very fine roots; common faint black (10YR 2/1) clay films on faces of peds; common fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

Btg1—23 to 28 inches; dark grayish brown (10YR 4/2) silty clay loam; common fine prominent light olive brown (2.5Y 5/4) and few medium prominent yellowish brown (10YR 5/6) mottles; moderate fine prismatic structure parting to moderate medium subangular blocky; firm; many very fine roots; common faint black (10YR 2/1) clay films on faces of peds; common fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

Btg2—28 to 38 inches; light brownish gray (2.5Y 6/2) silty clay loam; common medium prominent yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate coarse subangular blocky; firm; common very fine roots; common distinct dark gray (10YR 4/1) clay films on faces of peds; common fine rounded concretions (iron and manganese oxides); neutral; gradual smooth boundary.

Btg3—38 to 48 inches; light brownish gray (2.5Y 6/2) silty clay loam; common medium prominent yellowish brown (10YR 5/8) and few medium prominent light gray (5Y 7/1) mottles; moderate coarse subangular blocky structure; firm; few very fine roots; common faint dark gray (10YR 4/1) clay films on faces of peds; common fine rounded concretions (iron and manganese oxides); black (10YR 2/1) krotovinas; neutral; clear smooth boundary.

BCg—48 to 54 inches; light brownish gray (2.5Y 6/2) silty clay loam; common medium prominent yellowish brown (10YR 5/8) mottles; weak coarse subangular blocky structure; friable; few very fine roots; few faint grayish brown (10YR 5/2) clay films on faces of peds; common fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

Cg—54 to 60 inches; light olive gray (5Y 6/2) silt loam; many coarse prominent yellowish brown (10YR 5/8) mottles; massive; friable; few faint grayish brown (10YR 5/2) coatings on vertical cleavage planes; common medium rounded concretions (iron and manganese oxides); black (10YR 2/1) krotovinas; neutral.

The thickness of the solum ranges from 47 to 56 inches. The mollic epipedon ranges from 15 to 24 inches in thickness.

The A horizon has value of 2 or 3 and chroma of 1 or 2. It is commonly silty clay loam but in some pedons is silt loam. The Bt horizon has value of 2 or 3 and chroma of 1 or 2. The Btg horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2. It is medium acid to neutral. The Cg horizon is neutral to moderately alkaline.

Wagner Series

The Wagner series consists of poorly drained, very slowly permeable soils on bottom land. These soils formed in silty and clayey alluvium. Slopes range from 0 to 2 percent.

Wagner soils are similar to Denny soils and commonly are adjacent to Ambraw and Tice soils. Denny soils formed in loess. They are in depressions on uplands. Ambraw and Tice soils have a mollic epipedon and have a lower content of clay in the subsoil than the Wagner soils. Ambraw soils are in landscape positions similar to those of the Wagner soil. The somewhat poorly drained Tice soils are higher on the bottom land than the Wagner soils.

Typical pedon of Wagner silt loam, 2,053 feet east and 310 feet north of the southwest corner of sec. 6, T. 14 N., R. 13 W.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; mixed with dark grayish brown (10YR 4/2) material from the E horizon; weak fine granular structure; friable; common very fine roots; slightly acid; abrupt smooth boundary.

E—9 to 16 inches; grayish brown (10YR 5/2) silt loam; common fine distinct dark yellowish brown (10YR 4/6) mottles; weak medium platy structure; friable; few very fine and fine roots; few faint very dark gray (10YR 3/1) organic coatings on faces of peds; few fine rounded concretions (iron and manganese oxides); medium acid; clear smooth boundary.

Btg1—16 to 19 inches; dark grayish brown (10YR 4/2) silty clay loam; common fine prominent dark yellowish brown (10YR 4/6) mottles; moderate fine subangular blocky structure; firm; few very fine and fine roots; few faint very dark gray (10YR 3/1) clay films on faces of peds; few fine rounded concretions (iron and manganese oxides); strongly acid; clear smooth boundary.

Btg2—19 to 27 inches; dark grayish brown (10YR 4/2) silty clay; common fine prominent dark yellowish brown (10YR 3/6 and 4/6) mottles; moderate medium angular blocky structure; firm; few very fine roots; common faint very dark gray (10YR 3/1) clay films on faces of peds; common fine rounded concretions (iron and manganese oxides); strongly acid; clear smooth boundary.

Btg3—27 to 38 inches; dark grayish brown (10YR 4/2) silty clay; many medium prominent dark yellowish brown (10YR 4/6) and yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; common very fine roots; few faint very dark gray (10YR 3/1) organic coatings and common faint dark gray (10YR 4/1) clay films on faces of peds; many fine rounded concretions (iron and manganese oxides); medium acid; clear smooth boundary.

Btg4—38 to 53 inches; grayish brown (10YR 5/2) silty clay loam; many medium prominent dark yellowish brown (10YR 3/6 and 4/6) mottles; weak coarse subangular blocky structure; firm; few very fine roots; few faint very dark gray (10YR 3/1) fillings in channels; common faint dark gray (10YR 4/1) clay films on faces of peds; common fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

Cg—53 to 60 inches; grayish brown (10YR 5/2) silty clay loam that has strata of sandy clay loam; many medium prominent dark yellowish brown (10YR 3/6 and 4/6) and yellowish brown (10YR 5/8) mottles; massive; firm; dark gray (10YR 4/1) fillings in channels; common fine rounded concretions (iron and manganese oxides); neutral.

The thickness of the solum ranges from 42 to 60 inches. The Ap horizon has value of 2 or 3. The E horizon is 4 to 9 inches thick. It has value of 4 or 5 and chroma of 1 or 2. The Btg horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, and chroma of 1 or 2. It is strongly acid to slightly acid. The Cg horizon is slightly acid or neutral.

Wakeland Series

The Wakeland series consists of somewhat poorly drained, moderately permeable soils on bottom land. They formed in silty alluvium. Slopes range from 0 to 2 percent.

Wakeland soils are similar to Orion soils and commonly are adjacent to Arenzville, Lawson, and Orion soils. Arenzville and Orion soils have a dark, silty buried soil within a depth of 40 inches. The moderately well drained Arenzville soils are higher on the bottom land than the Wakeland soils and are adjacent to the uplands. Orion and Lawson soils are in landscape positions similar to those of the Wakeland soils. Lawson soils have a mollic epipedon.

Typical pedon of Wakeland silt loam, 233 feet west and 132 feet south of the northeast corner of sec. 29, T. 13 N., R. 8 W.

Ap—0 to 10 inches; mixed dark grayish brown (10YR 4/2) and brown (10YR 4/3) silt loam, light brownish gray (10YR 6/2) dry; weak medium granular structure; friable; many very fine roots; neutral; clear smooth boundary.

C1—10 to 20 inches; stratified dark grayish brown (10YR 4/2) and brown (10YR 5/3) silt loam; few fine prominent yellowish brown (10YR 5/8) mottles; massive; weak thick bedding planes; friable; common very fine roots; neutral; gradual smooth boundary.

C2—20 to 31 inches; stratified dark grayish brown (10YR 4/2) and brown (10YR 5/3) silt loam; many medium prominent strong brown (7.5YR 5/8) mottles; massive; weak thick bedding planes; friable; common very fine roots; neutral; clear smooth boundary.

C3—31 to 40 inches; stratified brown (10YR 5/3) and dark grayish brown (2.5Y 4/2) silt loam; common fine prominent strong brown (7.5YR 5/8) mottles; massive; weak thick bedding planes; friable; few very fine roots; neutral; clear smooth boundary.

C4—40 to 60 inches; stratified brown (10YR 4/3) and grayish brown (10YR 5/2) silt loam; common medium distinct yellowish brown (10YR 5/6) mottles; massive; friable; few very fine roots; few fine rounded concretions (iron and manganese oxides); neutral.

The Ap horizon has value of 4 or 5 and chroma of 2 or 3. Some pedons have an A horizon. This horizon is less than 6 inches thick. It has value of 3. The C horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 to 3. It is dominantly silt loam but in some pedons has thin strata of loam to fine sand. This horizon is slightly acid or neutral.

Watseka Series

The Watseka series consists of somewhat poorly drained, rapidly permeable soils along the base of terraces. These soils formed in sandy alluvium. Slopes range from 0 to 2 percent.

Watseka soils are similar to Hoopeston soils and commonly are adjacent to Ambraw, Orio, and Plainfield soils. Ambraw, Hoopeston, and Orio soils have a lower content of sand and a higher content of clay in the subsoil than the Watseka soils. The poorly drained Ambraw soils are lower on the landscape than the Watseka soils. Orio soils are in landscape positions similar to those of the Watseka soils. The excessively drained Plainfield soils are on terrace side slopes above the Watseka soils.

Typical pedon of Watseka loamy sand, 750 feet east and 1,400 feet south of the northwest corner of sec. 5, T. 16 N., R. 12 W.

Ap—0 to 11 inches; very dark grayish brown (10YR 3/2) loamy sand, grayish brown (10YR 5/2) dry; weak fine granular structure; very friable; common very fine roots; medium acid; abrupt smooth boundary.

Bw1—11 to 17 inches; brown (10YR 4/3) loamy sand; few fine distinct dark yellowish brown (10YR 4/6) mottles; weak medium subangular blocky structure; very friable; common very fine roots; few faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; medium acid; clear smooth boundary.

Bw2—17 to 27 inches; brown (10YR 5/3) loamy sand; common medium distinct dark yellowish brown (10YR 4/6) mottles; massive; loose; few very fine roots; few faint dark grayish brown (10YR 4/2) coatings on faces of cleavage planes; medium acid; clear smooth boundary.

C1—27 to 42 inches; brown (10YR 5/3) sand; common medium prominent yellowish red (5YR 5/8) and few coarse prominent yellowish brown (10YR 5/8) mottles; single grained; loose; few very fine roots; medium acid; clear smooth boundary.

C2—42 to 60 inches; pale brown (10YR 6/3) sand; common medium distinct yellowish brown (10YR 5/6) and brown (10YR 5/3) mottles; single grained; loose; neutral.

The thickness of the solum ranges from 25 to 36 inches. The mollic epipedon ranges from 10 to 18 inches in thickness.

The Ap horizon has chroma of 1 to 3. The Bw horizon has value of 4 or 5 and chroma of 2 or 3. It is strongly acid to slightly acid. The C horizon ranges from strongly acid to neutral.

Worthen Series

The Worthen series consists of well drained, moderately permeable soils on alluvial fans and foot slopes. These soils formed in silty alluvium. Slopes range from 0 to 12 percent.

Worthen soils are similar to Littleton and Ross soils and commonly are adjacent to Hamburg and Littleton soils. The somewhat poorly drained Littleton soils are lower on the landscape than the Worthen soils. Ross soils have a higher content of sand throughout than the Worthen soils. Hamburg soils formed in loess on the steeper slopes of bluffs.

Typical pedon of Worthen silt loam, 2 to 5 percent slopes, 160 feet south and 640 feet west of the northeast corner of sec. 26, T. 13 N., R. 13 W.

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

A—9 to 20 inches; dark brown (10YR 3/3) silt loam, brown (10YR 5/3) dry; weak medium granular structure; friable; few very fine and fine roots; slightly acid; clear smooth boundary.

AB—20 to 29 inches; dark brown (10YR 3/3) silt loam, brown (10YR 5/3) dry; weak fine subangular blocky structure; friable; few very fine and fine roots; neutral; clear smooth boundary.

Bw1—29 to 41 inches; brown (10YR 4/3) silt loam; weak fine subangular blocky structure; friable; few very fine and fine roots; few faint dark brown (10YR 3/3) organic coatings and few faint very pale brown (10YR 7/3) silt coatings on faces of peds; neutral; clear smooth boundary.

Bw2—41 to 60 inches; dark yellowish brown (10YR 4/4) and brown (10YR 4/3) silt loam; weak fine subangular blocky structure; friable; few very fine and fine roots; few faint very pale brown (10YR 7/3) silt coatings on faces of peds; neutral.

The solum ranges from 45 to 60 inches in thickness. The thickness of the mollic epipedon ranges from 24 to 36 inches.

The A horizon has value of 2 or 3 and chroma of 1 to 3. The Bw horizon has value of 3 to 5 and chroma of 3 or 4. It is neutral or mildly alkaline. Some pedons have a C horizon within a depth of 60 inches. This horizon is neutral or mildly alkaline silt loam.

Formation of the Soils

Dr. Leon Follmer, associate geologist, Illinois State Geological Survey, helped prepare this section.

Soil forms through processes that act on deposited or accumulated geologic material. The soil characteristics at any given point are determined by the physical and mineralogical composition of the parent material; the climate under which the soil formed; the plant and animal life on and in the soil; the relief, or lay of the land; and the length of time that the forces of soil formation have acted on the parent material (*6*).

Climate and plant and animal life are the active factors of soil formation. They act directly on the parent material either in place or after relocation by water, glaciers, or wind and slowly change it into a natural body that has genetically related horizons. Relief can modify the effects of climate and plant and animal life by inhibiting soil formation on eroded slopes and in wet depressions or nearly level areas. The parent material affects the kind of soil profile that forms and, in extreme cases, determines it almost entirely. Finally, time is needed for the transformation of the parent material into a soil that has differentiated horizons. Usually, a long time is required for the development of distinct horizons.

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

Parent Material

Parent material is the geologic material in which a soil forms. Most of the parent materials in Morgan and Scott Counties are a direct result of glaciers and sediments of the Wisconsinan and Illinoian Stages (*4, 14*). Although the parent materials are of glacial origin, their properties vary greatly, depending on the method of deposition. The dominant parent materials in the survey area are glacial till, glacial outwash, alluvium, and loess.

Glacial till is material laid down directly by glaciers with a minimum of water action. It consists of particles of different sizes mixed together. The small pebbles in glacial till generally have distinct edges and corners, indicating that they have not been subject to intense washing by water. The glacial till in Morgan and Scott Counties was deposited during the Illinoian Stage. It is generally loam or clay loam. Soils that formed in this material generally are on strongly sloping to very steep side slopes. They make up about 5 percent of the survey area. An example is Hickory soils.

In some areas a very firm layer higher in content of clay is in the upper few feet of the Illinoian till. This is a paleosol, which formed during the Sangamonian Stage, between the Illinoian and Wisconsinan Stages (*4, 14*). During the Sangamonian Stage, the glacial till was the surface deposit. It was subject to soil-forming processes. During the Wisconsinan Stage, these soils were buried by loess deposits. Elco and Ursa are examples of soils that formed in a thin layer of loess and in the underlying till that has a paleosol.

Loess was deposited directly by the wind. It consists of very uniform, calcareous, silt-sized particles. In Morgan and Scott Counties, the major source of this loess was the flood plains along the Mississippi and Illinois Rivers, although many smaller streams also could have been sources. These sediments were exposed to the wind when rivers swollen with glacial meltwater from the Wisconsinan glaciers dried seasonally and as the glaciers retreated. Since the sediments in the river valleys were exposed, the predominantly westerly winds picked up the loess and transported it many miles.

The loess covered the Illinoian till in a relatively uniform layer. In Morgan and Scott Counties, the loess ranges from 10 to 25 feet in thickness, thinning from west to east. It is the parent material in about 80 percent of the survey area. Most of the upland soils in the counties formed in loess. Ipava, Fayette, Sable, and Tama soils are examples.

Outwash was deposited by running water from melting glaciers. The size of the particles that make up outwash varies according to the speed of the stream that carried them. When the water slowed down, the coarser textured material was deposited first. The finer particles were carried a greater distance by the more slowly moving water. Outwash deposits in Morgan and Scott Counties generally occur as layers of sand, loamy sand, sandy loam, and loam. Hoopeston soils are an example of soils that formed in outwash. They are predominantly in the valley along the Illinois River.

In some areas the outwash was reworked and translocated by the wind after the initial deposition. These areas are on the terraces in the valley along the Illinois River and on side slopes adjacent to the valley. They make up about 5 percent of the survey area. Alvin, Plainfield, and Sparta are examples of soils that formed in sandy windblown material.

Alluvial sediments were deposited mainly during periods of stream overflow. They make up about 10 percent of the survey area. The alluvial areas are throughout the two counties. The largest area is adjacent to the Illinois River. The width of the areas ranges from less than 1/8 mile along the minor streams to several miles along the Illinois River. The sediments generally are silty or loamy. In some areas they have buried horizons of darker soil material.

Plant and Animal Life

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

The native vegetation in Morgan and Scott Counties was mainly deciduous hardwood trees or tall prairie grasses. Deciduous hardwoods contributed organic matter to the soil mainly as leaf litter. Their root systems were less fibrous than those of grasses and generally were not densely concentrated near the surface. Therefore, these soils have a surface soil that is thinner and lighter colored than that of the soils that formed under prairie grasses. In general, they are on narrow upland divides between streams or on the side slopes bordering stream valleys. Fayette, Keomah, and Rozetta soils formed under forest vegetation.

Prairie grasses have many fine fibrous roots that add large amounts of organic matter to the soil as they die and decay, especially where they are concentrated near the surface. As a result, soils that formed under prairie vegetation have a thick, black or dark brown surface layer. The prairie soils in the survey area are generally on the broad upland divides between streams. Examples are Ipava, Sable, and Tama soils.

Although plants have been the major living organisms affecting soil formation, micro-organisms, earthworms, insects, and large burrowing animals that live in or on the soil have also affected soil formation. Bacteria and fungi help to break down and decompose dead plants and animals and transform them into humus. Burrowing animals, such as earthworms, cicadas, and ground squirrels, help to incorporate the humus into the soil. Humus is very important in the development of soil structure and good tilth.

Climate

Morgan and Scott Counties have a temperate, humid, continental climate. The climate is essentially uniform throughout the survey area. Climatic differences are too small to have caused any obvious differences among the soils, except perhaps in areas where the effects of climate are modified locally by relief.

Climate affects soil formation through its effects on weathering, plant and animal life, and erosion. Water from rains and melting snow seeps slowly downward through the soil and causes physical and chemical changes. As the water moves downward, clay is moved from the surface soil to the subsoil, where it accumulates. The water dissolves minerals and moves them downward through the soil. This leaching has removed free lime from the upper layers of most of the soils in Morgan and Scott Counties. The temperature of the soil also is important since rainfall on frozen soil does not facilitate soil formation if it runs off the surface. Many of the processes of soil formation are halted or slowed when the soil is frozen.

Climate also influences the kind and extent of plant and animal life. The climate in Morgan and Scott Counties has favored deciduous hardwood forests and tall prairie grasses. It also has favored the decomposition of plants and animals, the remains of which are incorporated into the soil.

Heavy rains are harmful if they fall on soils that are exposed when they are farmed. Early spring rains can cause extensive erosion when the soil is partially frozen. The freezing restricts the rate of water intake and thus increases the runoff rate. More detailed information about the climate is available under the heading "General Nature of the Survey Area."

Relief

Relief, or local changes in elevation, has markedly affected the soils in Morgan and Scott Counties through its effect on runoff, infiltration, erosion, and natural drainage. The slope in the survey area ranges from 0 to 60 percent.

To a large extent, relief determines how much water infiltrates into a soil and how much runs off the surface. Runoff is most rapid and the infiltration rate slowest on the steeper slopes. In general, the runoff rate decreases as the slope decreases. Low areas are temporarily ponded by runoff from the adjacent slopes.

Relief affects natural drainage, or the depth to a seasonal high water table. Through its effect on aeration of the soil, natural drainage determines the color of the subsoil. The poorly drained Denny soils are in depressions and have a water table close to the surface most of the year. The soil pores contain much water, which restricts the circulation of air in the soils. Under these conditions, naturally occurring iron and manganese compounds are chemically reduced. As a result, the subsoil is dull gray and mottled. In the more sloping, well drained Sylvan soils, the water table is lower and most of the rainfall runs off the surface. The soil pores contain less water and much more air. The iron and manganese compounds are well oxidized. As a result, the subsoil is brown and brightly colored.

Nearly level, poorly drained soils, such as Sable soils, are less well developed than gently sloping, moderately well drained soils, such as Tama soils. Sable soils have a high water table much of the year. The wetness inhibits the removal of weathered products. In contrast, Tama soils are deeper to a water table. As a result, weathered products are translocated downward to a greater extent.

Local relief directly determines the intensity of soil erosion. Some erosion occurs on all sloping soils, but the hazard is more severe as the slope and the runoff rate increase.

Time

Time determines, to a great extent, the degree of profile development in a soil. The influence of time, however, can be modified by erosion, deposition of material, and local relief.

In most of the soils in Morgan and Scott Counties, sufficient time has passed to allow for the removal of calcium carbonates from the upper horizons. In the severely eroded Sylvan soils, however, erosion has exposed unleached loess. The upper horizons of these soils are still calcareous even though the surrounding soils have been leached of carbonate minerals.

The differences among soils resulting from the length of time that the parent materials have been in place are expressed in the degree of soil profile development. Arenzville soils have a very weakly expressed profile because they are on flood plains that periodically receive new alluvial sediments. These soils have not been in place long enough for distinct horizons to develop. Fayette soils are more strongly developed and have distinct horizons because the loess in which they formed has been in place a much longer time.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

AC soil. A soil having only an A and a C horizon. Commonly such soil formed in recent alluvium or on steep rocky slopes.

Aeration, soil. The exchange of air in 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.

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—

	Inches
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.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

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.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity, but is more precise in meaning.

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.

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.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

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.

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.

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 the activities of man or other animals 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.

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, and 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.

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.

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.

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table.

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.

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 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.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are—

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

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 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, and fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, and silty clay loam.

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).

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.

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. For example, 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.

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.

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 degree of acidity or alkalinity is expressed as—

	pH
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

Relief. The elevations or inequalities of a land surface, considered collectively.

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.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

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.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

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 of separates recognized in the United States are as follows:

	Millimeters
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.

Stripcropping. Growing crops in a systematic arrangement of strips or bands which provide vegetative barriers to wind and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

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.

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). Otherwise suitable soil material too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

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.

Valley fill. In glaciated regions, material deposited in stream valleys by glacial meltwater. In nonglaciated regions, alluvium deposited by heavily loaded streams.

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.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

(Recorded in the period 1951-80 at Jacksonville, 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----	34.3	16.4	25.4	38.7	11.5	0	1.46	0.66	2.43	4	5.0
February---	39.4	20.7	30.1	45.2	16.2	0	1.61	.76	2.60	4	5.5
March------	52.3	29.8	40.1	55.2	25.1	0	3.14	1.55	4.64	6	4.0
April------	65.0	42.3	53.7	67.3	39.2	170	3.99	2.25	6.37	7	.2
May--------	74.9	52.0	63.5	78.7	48.0	418	4.47	2.46	7.10	7	.0
June-------	83.9	61.0	72.5	88.0	58.7	698	4.05	1.28	6.47	6	.0
July-------	87.3	64.6	76.0	89.6	62.5	806	3.95	1.47	5.62	6	.0
August-----	85.0	62.5	73.8	87.8	59.9	738	3.66	1.01	6.04	5	.0
September--	78.4	54.5	67.0	82.1	51.0	510	3.66	1.14	6.17	6	.0
October----	67.9	43.8	55.9	70.6	40.2	210	2.95	1.09	4.59	5	.0
November---	52.5	32.4	42.5	56.6	29.1	0	2.21	1.12	3.07	5	1.2
December---	39.6	22.7	31.2	43.1	18.6	0	1.96	.74	3.25	5	4.2
Yearly:											
Average--	63.3	41.9	52.6	---	---	---	---	---	---	---	---
Total----	---	---	---	---	---	3,550	37.11	---	---	66	20.1

* 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 (55 degrees F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

(Recorded in the period 1960-80 at Jacksonville, 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--	Mar. 14	Mar. 23	Mar. 25
2 years in 10 later than--	Mar. 18	Mar. 30	Apr. 5
*5 years in 10 later than--	Mar. 31	Apr. 9	Apr. 22
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 19	Oct. 10	Oct. 5
2 years in 10 earlier than--	Oct. 28	Oct. 14	Oct. 8
*5 years in 10 earlier than--	Nov. 3	Oct. 27	Oct. 16

* Period of data record is 1931-60.

TABLE 3.--GROWING SEASON

(Recorded in the period 1951-80 at Jacksonville, 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	194	187	157
8 years in 10	211	193	173
5 years in 10	220	202	181
2 years in 10	233	216	192
1 year in 10	247	222	198

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Morgan County	Scott County	Total-- Area	Total-- Extent
		Acres	Acres	Acres	Pct
8E2	Hickory loam, 15 to 30 percent slopes, eroded	14,458	5,959	20,417	3.9
8E3	Hickory clay loam, 15 to 30 percent slopes, severely eroded	594	990	1,584	0.3
8F	Hickory silt loam, 20 to 50 percent slopes	9,347	4,835	14,182	2.7
17A	Keomah silt loam, 0 to 3 percent slopes	7,647	4,014	11,661	2.2
19C3	Sylvan silty clay loam, 5 to 10 percent slopes, severely eroded	5,950	2,285	8,235	1.6
19D2	Sylvan silt loam, 10 to 15 percent slopes, eroded	2,048	528	2,576	0.5
19D3	Sylvan silty clay loam, 10 to 15 percent slopes, severely eroded	2,269	1,956	4,225	0.8
19E2	Sylvan silt loam, 15 to 30 percent slopes, eroded	1,399	555	1,954	0.4
19E3	Sylvan silty clay loam, 15 to 30 percent slopes, severely eroded	1,016	813	1,829	0.3
26	Wagner silt loam	188	974	1,162	0.2
30F	Hamburg silt loam, 20 to 35 percent slopes	2,188	1,344	3,532	0.7
30G	Hamburg silt loam, 35 to 60 percent slopes	701	1,004	1,705	0.3
36B	Tama silt loam, 2 to 5 percent slopes	33,484	4,750	38,234	7.3
36C2	Tama silt loam, 5 to 10 percent slopes, eroded	5,524	1,837	7,361	1.4
37A	Worthen silt loam, 0 to 2 percent slopes	2,260	2,039	4,299	0.8
37B	Worthen silt loam, 2 to 5 percent slopes	768	887	1,655	0.3
37C	Worthen silt loam, 5 to 12 percent slopes	135	474	609	0.1
43A	Ipava silt loam, 0 to 2 percent slopes	76,190	11,713	87,903	16.8
43B	Ipava silt loam, 2 to 5 percent slopes	8,357	989	9,346	1.8
45	Denny silt loam	248	32	280	0.1
49	Watseka loamy sand	100	284	384	0.1
50	Virden silty clay loam	9,125	3,314	12,439	2.4
53B	Bloomfield loamy sand, 2 to 7 percent slopes	32	401	433	0.1
53D	Bloomfield loamy sand, 7 to 18 percent slopes	58	721	779	0.1
53E	Bloomfield loamy sand, 18 to 35 percent slopes	205	919	1,124	0.2
54B	Plainfield loamy sand, 2 to 7 percent slopes	2,074	1,342	3,416	0.7
54D	Plainfield loamy sand, 7 to 15 percent slopes	459	698	1,157	0.2
68	Sable silty clay loam	33,941	1,674	35,615	6.8
71	Darwin silty clay	308	9,236	9,544	1.8
73A	Ross loam, 0 to 3 percent slopes	150	0	150	*
78A	Arenzville silt loam, 0 to 3 percent slopes	2,260	2,315	4,575	0.9
81	Littleton silt loam	1,564	2,016	3,580	0.7
87	Dickinson sandy loam	167	409	576	0.1
88B	Sparta loamy sand, 1 to 6 percent slopes	926	1,348	2,274	0.4
107	Sawmill silty clay loam	1,018	409	1,427	0.3
119D2	Elco silt loam, 10 to 15 percent slopes, eroded	5,971	2,125	8,096	1.5
119D3	Elco silty clay loam, 10 to 15 percent slopes, severely eroded	904	907	1,811	0.3
119E2	Elco silt loam, 15 to 20 percent slopes, eroded	2,062	2,125	4,187	0.8
131B	Alvin fine sandy loam, 2 to 7 percent slopes	43	492	535	0.1
131D	Alvin fine sandy loam, 7 to 15 percent slopes	125	279	404	0.1
150B	Onarga fine sandy loam, 1 to 5 percent slopes	130	973	1,103	0.2
172A	Hoopeston sandy loam, 0 to 3 percent slopes	372	1,517	1,889	0.4
180	Dupo silt loam	829	2,785	3,614	0.7
200	Orio sandy loam	242	591	833	0.2
242B	Kendall silt loam, 1 to 5 percent slopes	96	279	375	0.1
244	Hartsburg silty clay loam	4,093	0	4,093	0.8
257A	Clarksdale silt loam, 0 to 3 percent slopes	5,647	3,338	8,985	1.7
259C2	Assumption silt loam, 5 to 10 percent slopes, eroded	3,134	0	3,134	0.6
259D2	Assumption silt loam, 10 to 15 percent slopes, eroded	1,158	107	1,265	0.2
279B	Rozetta silt loam, 2 to 5 percent slopes	38,535	19,756	58,291	11.2
279C2	Rozetta silt loam, 5 to 10 percent slopes, eroded	9,524	2,816	12,340	2.4
279C3	Rozetta silty clay loam, 5 to 10 percent slopes, severely eroded	6,440	4,262	10,702	2.0
280B	Fayette silt loam, 2 to 5 percent slopes	1,823	2,461	4,284	0.8
280C2	Fayette silt loam, 5 to 10 percent slopes, eroded	2,064	3,193	5,257	1.0
280D2	Fayette silt loam, 10 to 15 percent slopes, eroded	4,499	2,490	6,989	1.3
280D3	Fayette silty clay loam, 10 to 15 percent slopes, severely eroded	1,038	2,991	4,029	0.8
280E2	Fayette silt loam, 15 to 30 percent slopes, eroded	2,930	3,260	6,190	1.2

See footnote at end of table.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Morgan County	Scott County	Total-- Area	Extent
		Acres	Acres	Acres	Pct
284	Tice silt loam	670	523	1,193	0.2
288	Petrolia silt loam	0	986	986	0.2
302	Ambraw clay loam	1,321	3,264	4,585	0.9
333	Wakeland silt loam	2,920	5,385	8,305	1.6
415	Orion silt loam	1,605	2,113	3,718	0.7
451	Lawson silt loam	10,211	2,756	12,967	2.5
533	Urban land	218	0	218	*
567C2	Elkhart silt loam, 5 to 10 percent slopes, eroded	7,106	677	7,783	1.5
588	Sparta loamy sand, loamy substratum	457	586	1,043	0.2
682A	Medway loam, 0 to 3 percent slopes	402	1,771	2,173	0.4
864	Pits, quarry	0	115	115	*
915D2	Elco-Ursa silt loams, 10 to 15 percent slopes, eroded	441	162	603	0.1
915E2	Elco-Ursa silt loams, 15 to 30 percent slopes, eroded	716	118	834	0.2
962D3	Sylvan-Bold complex, 10 to 15 percent slopes, severely eroded	984	794	1,778	0.3
962E2	Bold-Sylvan silt loams, 15 to 35 percent slopes, eroded	1,982	3,389	5,371	1.0
962E3	Bold-Sylvan complex, 15 to 35 percent slopes, severely eroded	3,014	1,279	4,293	0.8
2036B	Tama-Urban land complex, 2 to 5 percent slopes	1,265	0	1,265	0.2
2036C	Tama-Urban land complex, 5 to 10 percent slopes	593	0	593	0.1
2043A	Ipava-Urban land complex, 0 to 3 percent slopes	1,718	0	1,718	0.3
2244	Hartsburg-Urban land complex	245	0	245	*
3070	Beaucoup silty clay loam, frequently flooded	1,844	1,316	3,160	0.6
7070	Beaucoup silty clay loam, rarely flooded	1,889	5,498	7,387	1.4
	Water	4,462	1,377	5,839	1.1
	Total	362,880	161,920	524,800	100.0

* Less than 0.1 percent.

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
17A	Keomah silt loam, 0 to 3 percent slopes (where drained)
26	Wagner silt loam (where drained)
36B	Tama silt loam, 2 to 5 percent slopes
37A	Worthen silt loam, 0 to 2 percent slopes
37B	Worthen silt loam, 2 to 5 percent slopes
43A	Ipava silt loam, 0 to 2 percent slopes
43B	Ipava silt loam, 2 to 5 percent slopes
45	Denny silt loam (where drained)
50	Virden silty clay loam (where drained)
68	Sable silty clay loam (where drained)
71	Darwin silty clay (where drained)
73A	Ross loam, 0 to 3 percent slopes (where protected from flooding or not frequently flooded during the growing season)
78A	Arenzville silt loam, 0 to 3 percent slopes (where protected from flooding or not frequently flooded during the growing season)
81	Littleton silt loam
87	Dickinson sandy loam
107	Sawmill silty clay loam (where drained and either protected from flooding or not frequently flooded during the growing season)
131B	Alvin fine sandy loam, 2 to 7 percent slopes
150B	Onarga fine sandy loam, 1 to 5 percent slopes
172A	Hoopeston sandy loam, 0 to 3 percent slopes
180	Dupo silt loam
200	Orio sandy loam (where drained)
242B	Kendall silt loam, 1 to 5 percent slopes (where drained)
244	Hartsburg silty clay loam (where drained)
257A	Clarksdale silt loam, 0 to 3 percent slopes (where drained)
279B	Rozetta silt loam, 2 to 5 percent slopes
280B	Fayette silt loam, 2 to 5 percent slopes
284	Tice silt loam
288	Petrolia silt loam (where drained)
302	Ambraw clay loam (where drained)
333	Wakeland silt loam (where drained and either protected from flooding or not frequently flooded during the growing season)
415	Orion silt loam (where protected from flooding or not frequently flooded during the growing season)
451	Lawson silt loam (where protected from flooding or not frequently flooded during the growing season)
682A	Medway loam, 0 to 3 percent slopes
7070	Beaucoup silty clay loam, rarely flooded (where drained)

TABLE 6.--LAND CAPABILITY CLASSES 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	Alfalfa-orchardgrass hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Bu	Tons	AUM*
8E2------------- Hickory	VIe	---	---	---	---	2.1	3.6
8E3------------- Hickory	VIe	---	---	---	---	1.9	3.2
8F-------------- Hickory	VIIe	---	---	---	---	---	3.0
17A------------- Keomah	IIw	131	39	52	72	5.2	8.0
19C3------------ Sylvan	IVe	97	30	46	57	4.3	7.2
19D2------------ Sylvan	IIIe	99	31	47	58	4.4	7.3
19D3------------ Sylvan	IVe	90	29	44	55	4.1	6.9
19E2------------ Sylvan	VIe	---	---	---	---	3.5	6.0
19E3------------ Sylvan	VIe	---	---	---	---	3.2	5.4
26-------------- Wagner	IIw	106	35	49	65	---	---
30F, 30G-------- Hamburg	VIIe	---	---	---	---	---	3.7
36B------------- Tama	IIe	153	46	61	88	5.8	9.7
36C2------------ Tama	IIIe	146	43	58	84	5.5	9.2
37A------------- Worthen	I	151	46	62	88	5.9	9.8
37B------------- Worthen	IIe	149	46	61	87	5.8	9.7
37C------------- Worthen	IIIe	145	44	60	84	5.7	9.4
43A------------- Ipava	I	163	52	66	91	6.1	10.2
43B------------- Ipava	IIe	161	51	65	90	6.0	10.1
45-------------- Denny	IIw	113	37	47	62	---	---
49-------------- Watseka	IIIs	92	31	43	62	3.7	6.2

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Oats	Alfalfa-orchardgrass hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Bu	Tons	AUM*
50----------------- Virden	IIw	138	46	57	72	---	---
53B---------------- Bloomfield	IIIs	79	31	41	51	3.2	5.3
53D---------------- Bloomfield	IVe	73	29	38	47	2.9	4.8
53E---------------- Bloomfield	VIe	---	---	---	---	---	4.5
54B---------------- Plainfield	IVs	56	20	28	40	2.5	4.2
54D---------------- Plainfield	VIs	---	---	---	40	2.2	3.8
68----------------- Sable	IIw	156	51	61	85	---	---
71----------------- Darwin	IIIw	99	35	47	63	---	---
73A---------------- Ross	IIw	145	46	60	80	5.5	9.2
78A---------------- Arenzville	IIw	138	42	56	80	5.4	9.0
81----------------- Littleton	I	159	50	63	90	6.1	10.2
87----------------- Dickinson	IIs	99	37	45	77	3.9	6.5
88B---------------- Sparta	IVs	84	29	37	52	3.3	5.4
107---------------- Sawmill	IIw	147	47	---	---	---	---
119D2-------------- Elco	IIIe	101	33	42	58	4.0	6.6
119D3-------------- Elco	IVe	90	30	39	51	3.5	5.9
119E2-------------- Elco	IVe	95	32	41	55	3.3	5.4
131B--------------- Alvin	IIe	97	36	46	66	4.3	6.7
131D--------------- Alvin	IIIe	92	35	45	64	4.0	6.6
150B--------------- Onarga	IIe	108	35	47	72	4.1	6.8

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Oats	Alfalfa-orchardgrass hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Bu	Tons	AUM*
172A------------ Hoopeston	IIs	105	33	47	70	4.1	6.8
180------------- Dupo	IIw	132	43	55	76	5.2	8.7
200------------- Orio	IIw	112	37	47	64	---	---
242B------------ Kendall	IIe	134	41	54	74	5.1	8.6
244------------- Hartsburg	IIw	145	47	56	79	---	---
257A------------ Clarksdale	I	140	43	57	79	5.3	8.8
259C2----------- Assumption	IIIe	120	37	52	72	4.7	7.8
259D2----------- Assumption	IIIe	116	35	51	70	4.6	7.6
279B------------ Rozetta	IIe	130	40	53	72	5.1	8.6
279C2----------- Rozetta	IIIe	123	38	51	69	4.9	8.2
279C3----------- Rozetta	IVe	115	35	47	64	4.5	7.6
280B------------ Fayette	IIe	128	39	53	72	5.2	8.6
280C2----------- Fayette	IIIe	123	37	50	69	4.9	8.2
280D2----------- Fayette	IIIe	114	34	46	64	4.6	7.6
280D3----------- Fayette	IVe	103	31	42	58	4.2	6.9
280E2----------- Fayette	VIe	---	---	---	---	3.8	6.4
284------------- Tice	I	153	47	61	84	5.7	9.5
288------------- Petrolia	IIw	130	43	49	66	---	---
302------------- Ambraw	IIw	132	43	52	70	---	---
333------------- Wakeland	IIw	135	45	---	---	---	8.7

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Oats	Alfalfa-orchardgrass hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Bu	Tons	AUM*
415------------- Orion	IIIw	135	43	---	---	---	7.8
451------------- Lawson	IIIw	161	48	---	---	---	9.5
533**. Urban land							
567C2----------- Elkhart	IIIe	124	38	51	71	4.9	8.2
588------------- Sparta	IIIs	85	29	37	53	3.3	5.5
682A------------ Medway	I	130	42	53	72	5.3	8.8
864**. Pits							
915D2----------- Elco-Ursa	IVe	83	26	33	47	3.6	5.3
915E2----------- Elco-Ursa	VIIe	---	---	---	---	---	3.6
962D3----------- Sylvan-Bold	IVe	---	---	---	---	3.6	5.9
962E2, 962E3---- Bold-Sylvan	VIe	---	---	---	---	3.1	5.1
2036B**. Tama-Urban land							
2036C**. Tama-Urban land							
2043A**. Ipava-Urban land							
2244**. Hartsburg-Urban land							
3070------------ Beaucoup	Vw	---	---	---	---	---	---
7070------------ Beaucoup	IIw	138	46	55	75	---	8.5

* 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.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 7.--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				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Volume*	
8E2, 8E3 Hickory	5R	Moderate	Moderate	Slight	Slight	White oak	85	67	Eastern white pine, red pine, yellow-poplar, sugar maple, white oak, black walnut.
						Northern red oak	85	67	
						Black oak	---	---	
						Green ash	---	---	
						Bitternut hickory	---	---	
						Yellow-poplar	95	98	
8F Hickory	5R	Severe	Severe	Slight	Slight	White oak	85	67	Eastern white pine, red pine, yellow-poplar, sugar maple, white oak, black walnut.
						Northern red oak	85	67	
						Black oak	---	---	
						Green ash	---	---	
						Bitternut hickory	---	---	
						Yellow-poplar	95	98	
19C3, 19D2, 19D3 Sylvan	6A	Slight	Slight	Slight	Slight	Yellow-poplar	90	90	White oak, black walnut, northern red oak, green ash, eastern white pine, red pine, sugar maple.
						White oak	80	62	
						Northern red oak	80	62	
						Black walnut	---	---	
19E2, 19E3 Sylvan	6R	Moderate	Moderate	Moderate	Slight	Yellow-poplar	90	90	White oak, black walnut, northern red oak, green ash, eastern white pine, red pine, sugar maple.
						White oak	80	62	
						Northern red oak	80	62	
						Black walnut	---	---	
30F Hamburg	2R	Moderate	Moderate	Moderate	Slight	White oak	45	31	Bur oak, eastern redcedar, white oak.
						Bur oak	---	---	
						Eastern redcedar	---	---	
						Post oak	---	---	
						Black oak	---	---	
30G Hamburg	2R	Severe	Severe	Severe	Slight	White oak	45	30	Bur oak, eastern redcedar, white oak.
						Bur oak	---	---	
						Eastern redcedar	---	---	
						Post oak	---	---	
						Black oak	---	---	
53D Bloomfield	4S	Slight	Slight	Moderate	Slight	Black oak	70	52	Eastern white pine, Scotch pine, red pine, eastern redcedar, jack pine.
						White oak	---	---	
						Scarlet oak	---	---	
						Shagbark hickory	---	---	
53E Bloomfield	4R	Moderate	Moderate	Moderate	Slight	Black oak	70	52	Eastern white pine, Scotch pine, red pine, eastern redcedar, jack pine.
						White oak	---	---	
						Scarlet oak	---	---	
						Shagbark hickory	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Volume*	
54D------------- Plainfield	4S	Slight	Slight	Moderate	Slight	Black oak----------- White oak----------- Black cherry-------- Scarlet oak--------- Northern red oak----	70 55 --- 68 ---	52 38 --- 50 ---	Red pine, eastern white pine, jack pine.
73A------------- Ross	5A	Slight	Slight	Slight	Slight	Northern red oak---- Yellow-poplar------- Sugar maple--------- White oak----------- Black walnut-------- Black cherry-------- White ash-----------	86 96 85 --- --- --- ---	68 100 52 --- --- --- ---	Eastern white pine, black walnut, white ash, Norway spruce, yellow-poplar.
107------------- Sawmill	5W	Slight	Moderate	Moderate	Moderate	Pin oak------------- Eastern cottonwood-- Sweetgum------------ Cherrybark oak------ American sycamore---	90 --- --- --- ---	72 --- --- --- ---	American sycamore, black spruce, hackberry, European larch, green ash, pin oak, red maple, swamp white oak.
119D2, 119D3---- Elco	4A	Slight	Slight	Slight	Slight	White oak----------- Northern red oak---- Black walnut--------	80 --- ---	62 --- ---	White oak, northern red oak, black walnut, green ash, eastern white pine, white ash.
119E2----------- Elco	4R	Moderate	Moderate	Moderate	Slight	White oak----------- Northern red oak---- Black walnut--------	80 --- ---	62 --- ---	White oak, northern red oak, black walnut, green ash, eastern white pine, white ash.
131D------------ Alvin	4A	Slight	Slight	Slight	Slight	White oak----------- Northern red oak---- Black walnut-------- Yellow-poplar-------	80 80 --- 90	62 62 --- 90	Green ash, black walnut, yellow-poplar, white oak, eastern white pine, American sycamore, sugar maple.
279B, 279C2, 279C3---------- Rozetta	4A	Slight	Slight	Slight	Slight	White oak----------- Northern red oak---- Yellow-poplar------- Black walnut--------	80 80 90 ---	62 62 90 ---	Eastern white pine, northern red oak, green ash, Scotch pine, yellow-poplar.

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Volume*	Trees to plant
280B, 280C2, 280D2, 280D3--- Fayette	4A	Slight	Slight	Slight	Slight	White oak-----------	80	62	Eastern white pine, northern red oak, green ash, yellow-poplar.
						Northern red oak----	80	62	
						Yellow-poplar-------	90	90	
						Black walnut--------	---	---	
280E2----------- Fayette	4R	Moderate	Moderate	Slight	Slight	White oak-----------	80	62	Eastern white pine, northern red oak, green ash, yellow-poplar.
						Northern red oak----	80	62	
						Yellow-poplar-------	90	90	
						Black walnut--------	---	---	
915D2**:									
Elco-----------	4A	Slight	Slight	Slight	Slight	White oak-----------	80	62	White oak, northern red oak, black walnut, green ash, eastern white pine, white ash.
						Northern red oak----	---	---	
						Black walnut--------	---	---	
Ursa-----------	4A	Slight	Slight	Slight	Slight	White oak-----------	70	52	Austrian pine, green ash, red maple, eastern redcedar, pin oak.
						Northern red oak----	70	52	
						Black oak-----------	70	52	
						Green ash-----------	---	---	
915E2**:									
Elco-----------	4R	Moderate	Moderate	Moderate	Slight	White oak-----------	80	62	White oak, northern red oak, black walnut, green ash, eastern white pine, white ash.
						Northern red oak----	---	---	
						Black walnut--------	---	---	
Ursa-----------	4R	Moderate	Moderate	Moderate	Slight	White oak-----------	70	52	Austrian pine, green ash, red maple, eastern redcedar, pin oak.
						Northern red oak----	70	52	
						Black oak-----------	70	52	
						Green ash-----------	---	---	
962D3**:									
Sylvan---------	6A	Slight	Slight	Slight	Slight	Yellow-poplar-------	90	90	White oak, black walnut, northern red oak, green ash, eastern white pine, red pine, sugar maple.
						White oak-----------	80	52	
						Northern red oak----	80	52	
						Black walnut--------	---	---	
Bold.									

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Volume*	
962E2**, 962E3**: Bold.									
Sylvan	6R	Moderate	Moderate	Moderate	Slight	Yellow-poplar	90	90	White oak, black walnut, northern red oak, green ash, eastern white pine, red pine, sugar maple.
						White oak	80	52	
						Northern red oak	80	52	
						Black walnut	---	---	
3070 Beaucoup	5W	Slight	Severe	Moderate	Moderate	Pin oak	90	72	Eastern cottonwood, red maple, American sycamore, sweetgum, pin oak.
						Eastern cottonwood	100	128	
						Sweetgum	---	---	
						Cherrybark oak	---	---	
						American sycamore	---	---	

* Volume is the yield in cubic feet per acre per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 8.--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
8E2, 8E3, 8F Hickory	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
17A Keomah	Silky dogwood, Amur honeysuckle, Amur privet, American cranberrybush.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
19C3, 19D2, 19D3, 19E2, 19E3 Sylvan	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
26 Wagner	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Norway spruce, Austrian pine, northern white-cedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
30F, 30G Hamburg	Osageorange, Russian-olive, eastern redcedar, Washington hawthorn.	Honeylocust, northern catalpa, bur oak, black locust, green ash.	Siberian elm	---
36B, 36C2 Tama	American cranberrybush, Amur honeysuckle, Amur privet, silky dogwood.	Blue spruce, northern white-cedar, Washington hawthorn, white fir.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
37A, 37B, 37C Worthen	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, northern white-cedar, blue spruce, white fir.	Austrian pine, Norway spruce.	Pin oak, eastern white pine.
43A, 43B Ipava	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
45 Denny	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Austrian pine, northern white-cedar, Norway spruce, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
49 Watseka	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.

TABLE 8.--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
50 Virden	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern white-cedar, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.
53B, 53D, 53E Bloomfield	Radiant crabapple, eastern redcedar, autumn-olive, Washington hawthorn, Amur honeysuckle, lilac, Tatarian honeysuckle.	Austrian pine, jack pine, red pine.	Eastern white pine	---
54B, 54D Plainfield	Eastern redcedar, radiant crabapple, Washington hawthorn, autumn-olive, Amur honeysuckle, lilac, Tatarian honeysuckle.	Red pine, Austrian pine, jack pine.	Eastern white pine	---
68 Sable	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern white-cedar, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.
71 Darwin	Amur privet, silky dogwood, Amur honeysuckle, American cranberrybush.	Norway spruce, Austrian pine, northern white-cedar, blue spruce, Washington hawthorn, white fir.	Eastern white pine	Pin oak.
73A Ross	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, northern white-cedar, blue spruce, white fir, Austrian pine.	Norway spruce	Pin oak, eastern white pine.
78A Arenzville	Amur privet, Amur honeysuckle, silky dogwood, American cranberrybush.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce	Pin oak, eastern white pine.
81 Littleton	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Eastern white pine, Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce	Pin oak.
87 Dickinson	Eastern redcedar, radiant crabapple, Washington hawthorn, autumn-olive, Amur honeysuckle, lilac, Tatarian honeysuckle.	Eastern white pine, Austrian pine, red pine, jack pine.	---	---

TABLE 8.--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
88B-----Sparta	Amur honeysuckle, lilac, eastern redcedar, radiant crabapple, Washington hawthorn, autumn-olive, Tatarian honeysuckle.	Red pine, jack pine, Austrian pine.	Eastern white pine----	---
107-----Sawmill	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Norway spruce, Austrian pine, northern white-cedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine----	Pin oak.
119D2, 119D3, 119E2-----Elco	Silky dogwood, honeysuckle, Amur privet, American cranberrybush.	Northern white-cedar, Washington hawthorn, blue spruce, white fir.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
131B, 131D-----Alvin	Amur privet, Washington hawthorn, Amur honeysuckle, American cranberrybush, Tatarian honeysuckle.	Austrian pine, northern white-cedar, osageorange, eastern redcedar.	Eastern white pine, red pine, Norway spruce.	---
150B-----Onarga	Amur privet, Washington hawthorn, American cranberrybush, Tatarian honeysuckle, Amur honeysuckle.	Austrian pine, northern white-cedar, osageorange, eastern redcedar.	Red pine, Norway spruce, eastern white pine.	---
172A-----Hoopeston	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce---------	Eastern white pine, pin oak.
180-----Dupo	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce---------	Eastern white pine, pin oak.
200-----Orio	American cranberrybush, Amur honeysuckle, Amur privet, silky dogwood.	Blue spruce, Norway spruce, northern white-cedar, Austrian pine, white fir, Washington hawthorn.	Eastern white pine----	Pin oak.
242B-----Kendall	Amur privet, silky dogwood, Amur honeysuckle, American cranberrybush.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce---------	Eastern white pine, pin oak.
244-----Hartsburg	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern white-cedar, Austrian pine, Norway spruce.	Eastern white pine----	Pin oak.

TABLE 8.--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
257A. Clarksdale	American cranberrybush, Amur honeysuckle, silky dogwood, Amur privet.	Washington hawthorn, northern white-cedar, blue spruce, white fir, Austrian pine.	Norway spruce	Eastern white pine, pin oak.
259C2, 259D2. Assumption	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
279B, 279C2, 279C3. Rozetta	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
280B, 280C2, 280D2, 280D3, 280E2. Fayette	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
284. Tice	Silky dogwood, autumn-olive.	Amur maple, Russian-olive, baldcypress.	Eastern white pine, Norway spruce.	Eastern cottonwood, American sycamore, red maple.
288. Petrolia	Silky dogwood, Amur privet, American cranberrybush, Amur honeysuckle.	White fir, blue spruce, Washington hawthorn, Norway spruce, Austrian pine, northern white-cedar.	Eastern white pine	Pin oak.
302. Ambraw	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Norway spruce, Austrian pine, northern white-cedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
333. Wakeland	Amur honeysuckle, silky dogwood, Amur privet, American cranberrybush, silky dogwood.	Northern white-cedar, Austrian pine, white fir, blue spruce, Washington hawthorn.	---	Eastern white pine, pin oak.
415. Orion	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
451. Lawson	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
533*. Urban land				

See footnote at end of table.

TABLE 8.--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
567C2. Elkhart	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
588. Sparta	Siberian peashrub, lilac, silky dogwood, eastern redcedar, gray dogwood, Amur maple, American cranberrybush.	Norway spruce	Red pine, eastern white pine, jack pine.	---
682A. Medway	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce	Eastern white pine.
864*. Pits				
915D2*, 915E2*:				
Elco	Silky dogwood, honeysuckle, Amur privet, American cranberrybush.	Northern white-cedar, Washington hawthorn, blue spruce, white fir.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
Ursa	American cranberrybush, Tatarian honeysuckle, Amur honeysuckle, arrowwood, Amur privet, Washington hawthorn, eastern redcedar.	Osageorange, green ash, Austrian pine.	Pin oak, eastern white pine.	---
962D3*:				
Sylvan	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
Bold	Osageorange, jack pine, eastern redcedar, Washington hawthorn, Russian-olive.	Northern catalpa, honeylocust.	---	---
962E2*, 962E3*:				
Bold	Osageorange, jack pine, eastern redcedar, Washington hawthorn, Russian-olive.	Northern catalpa, honeylocust.	---	---
Sylvan	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
2036B*: Tama.				

See footnote at end of table.

TABLE 8.--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
2036B*:				
Urban land.				
2036C*:				
Tama.				
Urban land.				
2043A*:				
Ipava	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
Urban land.				
2244*:				
Hartsburg	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern white-cedar, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.
Urban land.				
3070, 7070 Beaucoup	Silky dogwood, Amur privet, American cranberrybush, Amur honeysuckle.	Norway spruce, Austrian pine, northern white-cedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--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
8E2, 8E3 Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
8F Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
17A Keomah	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Slight	Slight.
19C3 Sylvan	Slight	Slight	Severe: slope.	Slight	Slight.
19D2, 19D3 Sylvan	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
19E2, 19E3 Sylvan	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
26 Wagner	Severe: flooding, wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
30F, 30G Hamburg	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
36B Tama	Slight	Slight	Moderate: slope.	Slight	Slight.
36C2 Tama	Slight	Slight	Severe: slope.	Slight	Slight.
37A Worthen	Slight	Slight	Slight	Slight	Slight.
37B Worthen	Slight	Slight	Moderate: slope.	Slight	Slight.
37C Worthen	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
43A, 43B Ipava	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
45 Denny	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
49 Watseka	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
50 Virden	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
53B Bloomfield	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
53D Bloomfield	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: droughty, slope.
53E Bloomfield	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
54B Plainfield	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
54D Plainfield	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope, droughty.
68 Sable	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
71 Darwin	Severe: flooding, ponding, percs slowly.	Severe: ponding, too clayey, percs slowly.	Severe: too clayey, ponding, percs slowly.	Severe: ponding, too clayey.	Severe: ponding, too clayey.
73A Ross	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
78A Arenzville	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
81 Littleton	Severe: flooding, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
87 Dickinson	Slight	Slight	Slight	Slight	Slight.
88B Sparta	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
107 Sawmill	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
119D2, 119D3 Elco	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
119E2 Elco	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
131B Alvin	Slight	Slight	Moderate: slope.	Slight	Slight.
131D Alvin	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
150B Onarga	Slight	Slight	Moderate: slope.	Slight	Slight.
172A Hoopeston	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
180 Dupo	Severe: flooding.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
200 Orio	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
242B Kendall	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
244 Hartsburg	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
257A Clarksdale	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
259C2 Assumption	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Slight	Slight.
259D2 Assumption	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight	Moderate: slope.
279B Rozetta	Slight	Slight	Moderate: slope.	Slight	Slight.
279C2, 279C3 Rozetta	Slight	Slight	Severe: slope.	Slight	Slight.
280B Fayette	Slight	Slight	Moderate: slope.	Slight	Slight.
280C2 Fayette	Slight	Slight	Severe: slope.	Slight	Slight.
280D2, 280D3 Fayette	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
280E2 Fayette	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
284 Tice	Severe: flooding.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
288 Petrolia	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
302 Ambraw	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
333 Wakeland	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: wetness, flooding.	Moderate: flooding, wetness.	Severe: flooding.
415 Orion	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: wetness, flooding.	Moderate: wetness, flooding.	Severe: flooding.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
451 Lawson	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: wetness, flooding.	Moderate: wetness, flooding.	Severe: flooding.
533*. Urban land					
567C2 Elkhart	Slight	Slight	Severe: slope.	Slight	Slight.
588 Sparta	Slight	Slight	Moderate: small stones.	Slight	Moderate: droughty.
682A Medway	Severe: flooding.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
864*. Pits					
915D2*:					
Elco	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
Ursa	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
915E2*:					
Elco	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
Ursa	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
962D3*:					
Sylvan	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
Bold	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
962E2*, 962E3*:					
Bold	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
Sylvan	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
2036B*:					
Tama	Slight	Slight	Moderate: slope.	Slight	Slight.
Urban land.					
2036C*:					
Tama	Slight	Slight	Severe: slope.	Slight	Slight.
Urban land.					

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
2043A*:					
Ipava	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
Urban land.					
2244*:					
Hartsburg	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
Urban land.					
3070 Beaucoup	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.	Severe: ponding.	Severe: ponding, flooding.
7070 Beaucoup	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--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 herbaceous plants	Hardwood trees	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
8E2, 8E3 Hickory	Poor	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
8F Hickory	Very poor	Poor	Good	Good	Very poor	Very poor	Poor	Good	Very poor.
17A Keomah	Good	Good	Fair	Fair	Fair	Fair	Good	Fair	Fair.
19C3, 19D2, 19D3 Sylvan	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
19E2, 19E3 Sylvan	Poor	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
26 Wagner	Good	Good	Fair	Fair	Good	Good	Good	Fair	Fair.
30F, 30G Hamburg	Very poor	Poor	Fair	Fair	Very poor	Very poor	Poor	Fair	Very poor.
36B Tama	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
36C2 Tama	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
37A, 37B Worthen	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
37C Worthen	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
43A Ipava	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
43B Ipava	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
45 Denny	Good	Good	Good	Fair	Good	Good	Good	Fair	Good.
49 Watseka	Fair	Fair	Good	Good	Fair	Poor	Fair	Good	Poor.
50 Virden	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
53B, 53D, 53E Bloomfield	Poor	Fair	Fair	Poor	Very poor	Very poor	Poor	Poor	Very poor.
54B Plainfield	Poor	Poor	Fair	Poor	Very poor	Very poor	Poor	Poor	Very poor.
54D Plainfield	Very poor	Poor	Fair	Poor	Very poor	Very poor	Poor	Poor	Very poor.

TABLE 10.--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
68: Sable	Fair	Good	Good	Fair	Good	Good	Good	Fair	Good.
71: Darwin	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Fair.
73A: Ross	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
78A: Arenzville	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
81: Littleton	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
87: Dickinson	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
88B: Sparta	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor.
107: Sawmill	Good	Good	Good	Fair	Good	Fair	Good	Fair	Fair.
119D2, 119D3: Elco	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
119E2: Elco	Poor	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
131B: Alvin	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
131D: Alvin	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
150B: Onarga	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
172A: Hoopeston	Fair	Good	Good	Good	Fair	Poor	Good	Good	Poor.
180: Dupo	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
200: Orio	Poor	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
242B: Kendall	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
244: Hartsburg	Fair	Fair	Good	Fair	Good	Good	Fair	Fair	Good.
257A: Clarksdale	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
259C2, 259D2: Assumption	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
279B: Rozetta	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.

TABLE 10.--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
279C2, 279C3-------Rozetta	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
280B---------------Fayette	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
280C2, 280D2-------Fayette	Fair	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
280D3--------------Fayette	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
280E2--------------Fayette	Poor	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
284----------------Tice	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
288----------------Petrolia	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
302----------------Ambraw	Good	Fair	Good	Good	Good	Good	Good	Good	Good.
333----------------Wakeland	Poor	Fair	Fair	Good	Fair	Fair	Fair	Good	Fair.
415----------------Orion	Good	Good	Good	Good	Good	Fair	Good	Good	Good.
451----------------Lawson	Poor	Fair	Fair	Good	Fair	Fair	Fair	Good	Fair.
533*. Urban land									
567C2--------------Elkhart	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
588----------------Sparta	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor.
682A---------------Medway	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
864*. Pits									
915D2*:									
Elco----------------	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
Ursa----------------	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
915E2*:									
Elco----------------	Poor	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor.

See footnote at end of table.

TABLE 10.--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
915E2*:									
Ursa	Poor	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
962D3*:									
Sylvan	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
Bold	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
962E2*, 962E3*:									
Bold	Very poor	Poor	Good	Good	Very poor	Very poor	Poor	Good	Very poor.
Sylvan	Very poor	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
2036B*:									
Tama	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Urban land.									
2036C*:									
Tama	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
Urban land.									
2043A*:									
Ipava	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Urban land.									
2244*:									
Hartsburg	Fair	Fair	Good	Fair	Good	Good	Fair	Fair	Good.
Urban land.									
3070, 7070 Beaucoup	Good	Good	Good	Fair	Good	Good	Good	Good	Good.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--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
8E2, 8E3, 8F------ Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
17A--------------- Keomah	Severe: wetness.	Severe: shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, frost action, low strength.	Slight.
19C3-------------- Sylvan	Slight---------	Moderate: shrink-swell.	Slight---------	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
19D2, 19D3-------- Sylvan	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
19E2, 19E3-------- Sylvan	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope, frost action.	Severe: slope.
26---------------- Wagner	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: low strength, wetness.	Severe: wetness.
30F, 30G---------- Hamburg	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, frost action.	Severe: slope.
36B--------------- Tama	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
36C2-------------- Tama	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
37A, 37B---------- Worthen	Slight---------	Slight---------	Slight---------	Slight---------	Severe: low strength, frost action.	Slight.
37C--------------- Worthen	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
43A, 43B---------- Ipava	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, frost action, shrink-swell.	Moderate: wetness.
45---------------- Denny	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: low strength, ponding, frost action.	Severe: ponding.

TABLE 11.--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
49: Watseka	Severe: wetness, cutbanks cave.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness, frost action.	Moderate: wetness, droughty.
50: Virden	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: low strength, ponding, shrink-swell.	Severe: ponding.
53B: Bloomfield	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
53D: Bloomfield	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
53E: Bloomfield	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
54B: Plainfield	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
54D: Plainfield	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope, droughty.
68: Sable	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
71: Darwin	Severe: ponding.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: low strength, ponding, shrink-swell.	Severe: ponding, too clayey.
73A: Ross	Moderate: wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
78A: Arenzville	Moderate: wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding, frost action.	Severe: flooding.
81: Littleton	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, frost action.	Moderate: wetness.
87: Dickinson	Severe: cutbanks cave.	Slight	Slight	Slight	Moderate: frost action.	Slight.
88B: Sparta	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.
107: Sawmill	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.

TABLE 11.--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
119D2, 119D3------ Elco	Moderate: too clayey, wetness, slope.	Moderate: shrink-swell, slope.	Moderate: wetness, slope, shrink-swell.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
119E2------------- Elco	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope, frost action.	Severe: slope.
131B-------------- Alvin	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Moderate: frost action.	Slight.
131D-------------- Alvin	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
150B-------------- Onarga	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Moderate: frost action.	Slight.
172A-------------- Hoopeston	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action.	Moderate: wetness.
180--------------- Dupo	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness, shrink-swell.	Severe: flooding.	Severe: low strength, frost action.	Moderate: wetness.
200--------------- Orio	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, frost action.	Severe: ponding.
242B-------------- Kendall	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
244--------------- Hartsburg	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
257A-------------- Clarksdale	Severe: wetness.	Severe: shrink-swell, wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell, frost action, low strength.	Moderate: wetness.
259C2------------- Assumption	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
259D2------------- Assumption	Moderate: wetness, slope.	Moderate: shrink-swell, slope.	Moderate: wetness, slope, shrink-swell.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
279B-------------- Rozetta	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
279C2, 279C3------ Rozetta	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.

TABLE 11.--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
280B Fayette	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.
280C2 Fayette	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: slope, shrink-swell.	Severe: frost action, low strength.	Slight.
280D2, 280D3 Fayette	Moderate: slope.	Moderate: slope, shrink-swell.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: frost action, low strength.	Moderate: slope.
280E2 Fayette	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: frost action, low strength, slope.	Severe: slope.
284 Tice	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: low strength, frost action.	Moderate: wetness.
288 Petrolia	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding.	Severe: ponding.
302 Ambraw	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness.	Severe: wetness.
333 Wakeland	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, frost action.	Severe: flooding.
415 Orion	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, flooding, frost action.	Severe: flooding.
451 Lawson	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, frost action.	Severe: flooding.
533*. Urban land						
567C2 Elkhart	Slight	Moderate: shrink-swell.	Slight	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
588 Sparta	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.
682A Medway	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: frost action, low strength.	Moderate: wetness.

See footnote at end of table.

TABLE 11.--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
864*. Pits						
915D2*:						
Elco----------------	Moderate: too clayey, wetness, slope.	Moderate: shrink-swell, slope.	Moderate: wetness, slope, shrink-swell.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
Ursa----------------	Moderate: too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.	Moderate: slope.
915E2*:						
Elco----------------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope, frost action.	Severe: slope.
Ursa----------------	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, slope, shrink-swell.	Severe: slope.
962D3*:						
Sylvan--------------	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
Bold----------------	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: frost action.	Moderate: slope.
962E2*, 962E3*:						
Bold----------------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, frost action.	Severe: slope.
Sylvan--------------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope, frost action.	Severe: slope.
2036B*:						
Tama----------------	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
Urban land.						
2036C*:						
Tama----------------	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
Urban land.						
2043A*:						
Ipava---------------	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, frost action, shrink-swell.	Moderate: wetness.

See footnote at end of table.

TABLE 11.--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
2043A*:						
Urban land.						
2244*:						
Hartsburg	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
Urban land.						
3070 Beaucoup	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: ponding, flooding.
7070 Beaucoup	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding.	Severe: ponding.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--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	Area sanitary landfill	Daily cover for landfill
8E2, 8E3, 8F: Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
17A: Keomah	Severe: percs slowly, wetness.	Severe: wetness.	Severe: wetness.	Poor: too clayey, hard to pack.
19C3: Sylvan	Slight	Severe: slope.	Slight	Good.
19D2, 19D3: Sylvan	Moderate: slope.	Severe: slope.	Moderate: slope.	Fair: slope.
19E2, 19E3: Sylvan	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
26: Wagner	Severe: wetness, percs slowly.	Slight	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
30F, 30G: Hamburg	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
36B: Tama	Moderate: wetness.	Moderate: seepage, slope, wetness.	Moderate: wetness.	Fair: too clayey.
36C2: Tama	Moderate: wetness.	Severe: slope.	Moderate: wetness.	Fair: too clayey.
37A: Worthen	Slight	Moderate: seepage.	Slight	Good.
37B: Worthen	Slight	Moderate: seepage, slope.	Slight	Good.
37C: Worthen	Moderate: slope.	Severe: slope.	Moderate: slope.	Fair: slope.
43A, 43B: Ipava	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
45: Denny	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Poor: ponding.
49: Watseka	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: too sandy, wetness, seepage.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Area sanitary landfill	Daily cover for landfill
50----------------- Virden	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
53B---------------- Bloomfield	Severe: poor filter.	Severe: seepage.	Severe: seepage.	Poor: seepage, too sandy.
53D---------------- Bloomfield	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage.	Poor: seepage, too sandy.
53E---------------- Bloomfield	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
54B---------------- Plainfield	Severe: poor filter.	Severe: seepage.	Severe: seepage.	Poor: too sandy, seepage.
54D---------------- Plainfield	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage.	Poor: too sandy, seepage.
68----------------- Sable	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: hard to pack, ponding.
71----------------- Darwin	Severe: ponding, percs slowly.	Slight----------------	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
73A---------------- Ross	Severe: flooding.	Severe: seepage, flooding.	Severe: flooding, seepage.	Good.
78A---------------- Arenzville	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: wetness.
81----------------- Littleton	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
87----------------- Dickinson	Severe: poor filter.	Severe: seepage.	Severe: seepage.	Poor: seepage, too sandy.
88B---------------- Sparta	Severe: poor filter.	Severe: seepage.	Severe: seepage.	Poor: seepage, too sandy.
107---------------- Sawmill	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: flooding, wetness.	Poor: wetness.
119D2, 119D3-------- Elco	Severe: wetness, percs slowly.	Severe: slope, wetness.	Moderate: wetness, slope.	Poor: too clayey.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Area sanitary landfill	Daily cover for landfill
119E2: Elco	Severe: wetness, percs slowly, slope.	Severe: slope, wetness.	Severe: slope.	Poor: too clayey, slope.
131B: Alvin	Slight	Severe: seepage.	Severe: seepage.	Fair: thin layer.
131D: Alvin	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Fair: slope, thin layer.
150B: Onarga	Severe: poor filter.	Severe: seepage.	Severe: seepage.	Poor: thin layer.
172A: Hoopeston	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
180: Dupo	Severe: wetness, percs slowly.	Slight	Severe: wetness.	Poor: too clayey, hard to pack.
200: Orio	Severe: ponding, percs slowly.	Severe: seepage, ponding.	Severe: ponding.	Poor: seepage, too sandy, ponding.
242B: Kendall	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
244: Hartsburg	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
257A: Clarksdale	Severe: percs slowly, wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness, too clayey, hard to pack.
259C2: Assumption	Severe: wetness, percs slowly.	Severe: slope, wetness.	Slight	Fair: too clayey, wetness.
259D2: Assumption	Severe: wetness, percs slowly.	Severe: slope, wetness.	Moderate: slope.	Fair: too clayey, slope, wetness.
279B: Rozetta	Moderate: wetness.	Moderate: seepage, slope, wetness.	Moderate: wetness.	Fair: too clayey.
279C2, 279C3: Rozetta	Moderate: wetness.	Severe: slope.	Moderate: wetness.	Fair: too clayey.
280B: Fayette	Slight	Moderate: slope, seepage.	Slight	Fair: too clayey.
280C2: Fayette	Slight	Severe: slope.	Slight	Fair: too clayey.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Area sanitary landfill	Daily cover for landfill
280D2: Fayette	Moderate: slope.	Severe: slope.	Moderate: slope.	Fair: slope, too clayey.
280D3: Fayette	Moderate: slope.	Severe: slope.	Moderate: slope.	Fair: too clayey, slope.
280E2: Fayette	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
284: Tice	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: hard to pack.
288: Petrolia	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Poor: ponding.
302: Ambraw	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Poor: wetness.
333: Wakeland	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
415: Orion	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: flooding, wetness.	Poor: wetness.
451: Lawson	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
533*. Urban land				
567C2: Elkhart	Slight	Severe: slope.	Slight	Good.
588: Sparta	Severe: poor filter.	Severe: seepage.	Severe: seepage.	Poor: seepage, too sandy.
682A: Medway	Severe: wetness.	Severe: wetness, seepage.	Severe: wetness, seepage.	Fair: wetness.
864*. Pits				
915D2*:				
Elco	Severe: wetness, percs slowly.	Severe: slope, wetness.	Moderate: wetness, slope.	Poor: too clayey.
Ursa	Severe: percs slowly.	Severe: slope.	Moderate: slope.	Poor: too clayey, hard to pack.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Area sanitary landfill	Daily cover for landfill
915E2*:				
Elco	Severe: wetness, percs slowly, slope.	Severe: slope, wetness.	Severe: slope.	Poor: too clayey, slope.
Ursa	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Poor: too clayey, hard to pack, slope.
962D3*:				
Sylvan	Moderate: slope.	Severe: slope.	Moderate: slope.	Fair: slope.
Bold	Moderate: slope.	Severe: slope.	Moderate: slope.	Fair: slope.
962E2*, 962E3*:				
Bold	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Sylvan	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
2036B*:				
Tama	Moderate: wetness.	Moderate: seepage, slope, wetness.	Moderate: wetness.	Fair: too clayey.
Urban land.				
2036C*:				
Tama	Moderate: wetness.	Severe: slope.	Moderate: wetness.	Fair: too clayey.
Urban land.				
2043A*:				
Ipava	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Urban land.				
2244*:				
Hartsburg	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
Urban land.				
3070 Beaucoup	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: ponding.
7070 Beaucoup	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Poor: ponding.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--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
8E2, 8E3 Hickory	Fair: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
8F Hickory	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
17A Keomah	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
19C3 Sylvan	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
19D2 Sylvan	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
19D3 Sylvan	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
19E2, 19E3 Sylvan	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
26 Wagner	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
30F, 30G Hamburg	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
36B, 36C2 Tama	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
37A, 37B Worthen	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
37C Worthen	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
43A, 43B Ipava	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
45 Denny	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
49 Watseka	Fair: wetness.	Probable	Improbable: too sandy.	Fair: too sandy.
50 Virden	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
53B Bloomfield	Good	Probable	Improbable: too sandy.	Fair: too sandy.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
53D------------------ Bloomfield	Good-----------------	Probable-------------	Improbable: too sandy.	Fair: too sandy, slope.
53E------------------ Bloomfield	Poor: slope.	Probable-------------	Improbable: too sandy.	Poor: slope.
54B, 54D------------- Plainfield	Good-----------------	Probable-------------	Improbable: too sandy.	Poor: thin layer.
68------------------- Sable	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
71------------------- Darwin	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
73A------------------ Ross	Good-----------------	Improbable: excess fines.	Improbable: excess fines.	Good.
78A------------------ Arenzville	Good-----------------	Improbable: excess fines.	Improbable: excess fines.	Good.
81------------------- Littleton	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
87------------------- Dickinson	Good-----------------	Probable-------------	Improbable: too sandy.	Good.
88B------------------ Sparta	Good-----------------	Probable-------------	Improbable: too sandy.	Poor: thin layer.
107------------------ Sawmill	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
119D2---------------- Elco	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer, slope.
119D3---------------- Elco	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, thin layer, slope.
119E2---------------- Elco	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
131B----------------- Alvin	Good-----------------	Probable-------------	Improbable: too sandy.	Good.
131D----------------- Alvin	Good-----------------	Probable-------------	Improbable: too sandy.	Fair: slope.
150B----------------- Onarga	Good-----------------	Probable-------------	Improbable: too sandy.	Fair: area reclaim, thin layer.
172A----------------- Hoopeston	Fair: wetness.	Probable-------------	Improbable: too sandy.	Fair: small stones, thin layer.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
180: Dupo	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
200: Orio	Poor: wetness.	Probable	Improbable: too sandy.	Poor: wetness.
242B: Kendall	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
244: Hartsburg	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
257A: Clarksdale	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
259C2: Assumption	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
259D2: Assumption	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
279B, 279C2: Rozetta	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
279C3: Rozetta	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
280B, 280C2: Fayette	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
280D2: Fayette	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
280D3: Fayette	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
280E2: Fayette	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
284: Tice	Fair: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Good.
288: Petrolia	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
302: Ambraw	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
333: Wakeland	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
415: Orion	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
451: Lawson	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
533*. Urban land				
567C2 Elkhart	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
588 Sparta	Good	Improbable: thin layer.	Improbable: too sandy.	Poor: thin layer.
682A Medway	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
864*. Pits				
915D2*:				
Elco	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer, slope.
Ursa	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
915E2*:				
Elco	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Ursa	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
962D3*:				
Sylvan	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
Bold	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
962E2*, 962E3*:				
Bold	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Sylvan	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
2036B*:				
Tama	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Urban land.				
2036C*:				
Tama	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Urban land.				
2043A*:				
Ipava	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
2043A*:				
Urban land.				
2244*:				
Hartsburg	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Urban land.				
3070, 7070 Beaucoup	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--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
8E2, 8E3, 8F------ Hickory	Severe: slope.	Moderate: thin layer.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
17A--------------- Keomah	Slight---------	Severe: hard to pack.	Frost action, percs slowly.	Wetness, percs slowly.	Wetness, erodes easily, percs slowly.	Erodes easily, percs slowly.
19C3-------------- Sylvan	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
19D2, 19D3, 19E2, 19E3------------ Sylvan	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
26---------------- Wagner	Slight---------	Severe: wetness.	Percs slowly---	Wetness, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
30F, 30G---------- Hamburg	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
36B, 36C2--------- Tama	Moderate: seepage, slope.	Slight---------	Deep to water	Slope----------	Erodes easily	Erodes easily.
37A--------------- Worthen	Moderate: seepage.	Moderate: piping.	Deep to water	Favorable------	Erodes easily	Erodes easily.
37B--------------- Worthen	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope----------	Erodes easily	Erodes easily.
37C--------------- Worthen	Severe: slope.	Moderate: piping.	Deep to water	Slope----------	Slope, erodes easily.	Slope, erodes easily.
43A--------------- Ipava	Slight---------	Severe: wetness.	Frost action---	Wetness--------	Erodes easily, wetness.	Wetness, erodes easily.
43B--------------- Ipava	Moderate: slope.	Severe: wetness.	Frost action, slope.	Wetness, slope.	Erodes easily, wetness.	Wetness, erodes easily.
45---------------- Denny	Slight---------	Severe: ponding.	Ponding, percs slowly, frost action.	Ponding, percs slowly, erodes easily.	Erodes easily, ponding.	Wetness, erodes easily, percs slowly.
49---------------- Watseka	Severe: seepage.	Severe: piping, seepage, wetness.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
50---------------- Virden	Slight---------	Severe: hard to pack, ponding.	Ponding, frost action.	Ponding--------	Ponding--------	Wetness.
53B--------------- Bloomfield	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty, rooting depth.

TABLE 14.--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
53D, 53E: Bloomfield	Severe: seepage, slope.	Severe: seepage, piping.	Deep to water	Droughty, fast intake, soil blowing.	Slope, too sandy, soil blowing.	Slope, droughty, rooting depth.
54B: Plainfield	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
54D: Plainfield	Severe: seepage, slope.	Severe: seepage, piping.	Deep to water	Droughty, fast intake, soil blowing.	Slope, too sandy, soil blowing.	Droughty, slope.
68: Sable	Moderate: seepage.	Severe: ponding.	Ponding, frost action.	Ponding	Ponding	Wetness.
71: Darwin	Slight	Severe: hard to pack, ponding.	Ponding, percs slowly.	Ponding, slow intake, percs slowly.	Ponding, percs slowly.	Wetness, percs slowly.
73A: Ross	Severe: seepage.	Severe: piping.	Deep to water	Flooding	Favorable	Favorable.
78A: Arenzville	Moderate: seepage.	Severe: piping.	Deep to water	Erodes easily, flooding.	Erodes easily	Erodes easily.
81: Littleton	Moderate: seepage.	Severe: wetness, piping.	Frost action	Wetness	Erodes easily, wetness.	Wetness, erodes easily.
87: Dickinson	Severe: seepage.	Severe: seepage.	Deep to water	Soil blowing	Soil blowing, too sandy.	Favorable.
88B: Sparta	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
107: Sawmill	Moderate: seepage.	Severe: wetness.	Flooding, frost action.	Wetness, flooding.	Wetness	Wetness.
119D2, 119D3, 119E2: Elco	Severe: slope.	Moderate: piping, wetness.	Frost action, slope.	Wetness, slope, erodes easily.	Slope, erodes easily, wetness.	Slope, erodes easily.
131B: Alvin	Severe: seepage.	Severe: piping.	Deep to water	Soil blowing, slope.	Soil blowing	Favorable.
131D: Alvin	Severe: seepage, slope.	Severe: piping.	Deep to water	Soil blowing, slope.	Slope, soil blowing.	Slope.
150B: Onarga	Severe: seepage.	Severe: piping.	Deep to water	Soil blowing, slope.	Soil blowing	Favorable.
172A: Hoopeston	Severe: seepage.	Severe: seepage, piping, wetness.	Frost action, cutbanks cave.	Wetness, soil blowing, rooting depth.	Wetness, too sandy, soil blowing.	Wetness, rooting depth.
180: Dupo	Moderate: seepage.	Severe: wetness.	Percs slowly, frost action.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Erodes easily, percs slowly.

TABLE 14.--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
200 Orio	Moderate: seepage.	Severe: seepage, piping, ponding.	Ponding, frost action, cutbanks cave.	Ponding, soil blowing.	Ponding, too sandy, soil blowing.	Wetness.
242B Kendall	Moderate: seepage, slope.	Severe: wetness.	Frost action, slope.	Wetness, slope, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
244 Hartsburg	Moderate: seepage.	Severe: ponding.	Ponding, frost action.	Ponding	Ponding	Wetness.
257A Clarksdale	Slight	Severe: wetness.	Frost action	Wetness, erodes easily.	Wetness, erodes easily.	Wetness, erodes easily.
259C2 Assumption	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope	Erodes easily	Erodes easily.
259D2 Assumption	Severe: slope.	Moderate: piping.	Deep to water	Slope	Slope, erodes easily.	Slope, erodes easily.
279B, 279C2, 279C3 Rozetta	Moderate: seepage, slope.	Slight	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
280B, 280C2 Fayette	Moderate: slope, seepage.	Slight	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
280D2, 280D3, 280E2 Fayette	Severe: slope.	Slight	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
284 Tice	Moderate: seepage.	Severe: wetness.	Frost action	Wetness	Wetness	Favorable.
288 Petrolia	Slight	Severe: ponding.	Ponding, percs slowly.	Ponding, percs slowly.	Ponding, percs slowly.	Wetness, percs slowly.
302 Ambraw	Moderate: seepage.	Severe: wetness.	Frost action	Wetness	Wetness	Wetness.
333 Wakeland	Moderate: seepage.	Severe: piping, wetness.	Flooding, frost action.	Wetness, erodes easily, flooding.	Erodes easily, wetness.	Wetness, erodes easily.
415 Orion	Moderate: seepage.	Severe: piping, wetness.	Flooding, frost action.	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
451 Lawson	Moderate: seepage.	Severe: wetness.	Flooding, frost action.	Wetness, flooding.	Erodes easily, wetness.	Wetness, erodes easily.
533*. Urban land						
567C2 Elkhart	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope	Erodes easily	Erodes easily.

See footnote at end of table.

TABLE 14.--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
588----------------- Sparta	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
682A--------------- Medway	Severe: seepage.	Severe: piping, wetness.	Frost action---	Wetness---------	Wetness---------	Favorable.
864*. Pits						
915D2*, 915E2*: Elco--------------	Severe: slope.	Moderate: piping, wetness.	Frost action, slope.	Wetness, slope, erodes easily.	Slope, erodes easily, wetness.	Slope, erodes easily.
Ursa--------------	Severe: slope.	Moderate: hard to pack.	Deep to water	Percs slowly, slope.	Slope, erodes easily, percs slowly.	Slope, erodes easily.
962D3*: Sylvan-----------	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
Bold--------------	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
962E2*, 962E3*: Bold--------------	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
Sylvan-----------	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
2036B*: Tama--------------	Moderate: seepage, slope.	Slight----------	Deep to water	Slope-----------	Erodes easily	Erodes easily.
Urban land.						
2036C*: Tama--------------	Moderate: seepage, slope.	Slight----------	Deep to water	Slope-----------	Erodes easily	Erodes easily.
Urban land.						
2043A*: Ipava-------------	Slight----------	Severe: wetness.	Frost action---	Wetness---------	Erodes easily, wetness.	Wetness, erodes easily.
Urban land.						
2244*: Hartsburg---------	Moderate: seepage.	Severe: ponding.	Ponding, frost action.	Ponding---------	Ponding---------	Wetness.
Urban land.						

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Limitations for-- Embankments, dikes, and levees	Features affecting-- Drainage	Features affecting-- Irrigation	Features affecting-- Terraces and diversions	Features affecting-- Grassed waterways
3070 Beaucoup	Slight	Severe: ponding.	Ponding, flooding, frost action.	Ponding, flooding.	Ponding	Wetness.
7070 Beaucoup	Slight	Severe: ponding.	Ponding, frost action.	Ponding	Ponding	Wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--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		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
8E2 Hickory	0-17	Loam	CL	A-6, A-4	0-5	95-100	90-100	90-100	75-95	20-35	8-15
	17-45	Clay loam, silty clay loam.	CL	A-6, A-7	0-5	95-100	90-100	80-95	65-80	30-50	15-30
	45-60	Clay loam, sandy loam, loam.	CL-ML, CL	A-4, A-6	0-5	85-100	85-95	80-95	60-80	20-40	5-20
8E3 Hickory	0-6	Clay loam	CL	A-6, A-7	0-5	95-100	90-100	80-95	70-85	30-50	15-30
	6-50	Clay loam, silty clay loam.	CL	A-6, A-7	0-5	95-100	90-100	80-95	65-80	30-50	15-30
	50-60	Clay loam, sandy loam, loam.	CL-ML, CL	A-4, A-6	0-5	85-100	85-95	80-95	60-80	20-40	5-20
8F Hickory	0-17	Silt loam, loam	CL	A-6, A-4	0-5	95-100	90-100	90-100	75-95	20-35	8-15
	17-45	Clay loam, silty clay loam.	CL	A-6, A-7	0-5	95-100	90-100	80-95	65-80	30-50	15-30
	45-60	Clay loam, sandy loam, loam.	CL-ML, CL	A-4, A-6	0-5	85-100	80-95	80-95	60-80	20-40	5-20
17A Keomah	0-13	Silt loam	CL-ML, CL	A-4, A-6	0	100	100	100	95-100	25-35	5-15
	13-58	Silty clay loam, silty clay.	CH, CL	A-7	0	100	100	100	95-100	45-60	30-45
	58-60	Silty clay loam, silt loam.	CL	A-7, A-6	0	100	100	100	95-100	35-50	15-30
19C3 Sylvan	0-6	Silty clay loam	CL	A-7, A-6	0	100	100	100	95-100	35-50	20-30
	6-25	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	100	95-100	35-50	20-30
	25-60	Silt loam	CL, CL-ML	A-6, A-4	0	100	100	95-100	95-100	20-40	5-20
19D2 Sylvan	0-10	Silt loam	CL-ML, CL	A-4, A-6	0	100	100	100	95-100	25-35	5-15
	10-27	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	100	95-100	35-50	20-30
	27-60	Silt loam	CL, CL-ML	A-6, A-4	0	100	100	95-100	95-100	20-40	5-20
19D3 Sylvan	0-6	Silty clay loam	CL	A-7, A-6	0	100	100	100	95-100	35-50	20-30
	6-25	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	100	95-100	35-50	20-30
	25-60	Silt loam	CL, CL-ML	A-6, A-4	0	100	100	95-100	95-100	20-40	5-20
19E2 Sylvan	0-10	Silt loam	CL-ML, CL	A-4, A-6	0	100	100	100	95-100	25-35	5-15
	10-27	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	100	95-100	35-50	20-30
	27-60	Silt loam	CL, CL-ML	A-6, A-4	0	100	100	95-100	95-100	20-40	5-20
19E3 Sylvan	0-6	Silty clay loam	CL	A-7, A-6	0	100	100	100	95-100	35-50	20-30
	6-25	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	100	95-100	35-50	20-30
	25-60	Silt loam	CL, CL-ML	A-6, A-4	0	100	100	95-100	95-100	20-40	5-20
26 Wagner	0-9	Silt loam	CL, CL-ML	A-4, A-6	0	100	100	95-100	90-100	24-35	6-15
	9-16	Silt loam	ML, CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	20-35	3-15
	16-53	Silty clay, silty clay loam.	CH, CL	A-7	0	100	100	95-100	90-100	45-60	25-40
	53-60	Silty clay loam	CL, CH	A-6, A-7	0	100	100	95-100	90-100	35-55	15-30
30F, 30G Hamburg	0-15	Silt loam	CL-ML, ML	A-4	0	100	100	100	95-100	<25	NP-5
	15-60	Silt loam, very fine sandy loam, silt.	CL-ML, ML	A-4	0	100	100	100	95-100	<25	NP-5

TABLE 15.--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	
36B, 36C2-------- Tama	0-14	Silt loam--------	ML	A-6, A-7	0	100	100	100	95-100	35-50	10-20
	14-55	Silty clay loam	CL	A-7	0	100	100	100	95-100	40-50	15-25
	55-60	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	100	95-100	35-45	15-25
37A, 37B, 37C---- Worthen	0-29	Silt loam--------	CL	A-4, A-6	0	100	100	95-100	80-100	25-40	7-21
	29-60	Silt loam--------	CL	A-4, A-6	0	100	100	95-100	80-100	25-40	7-21
43A, 43B--------- Ipava	0-9	Silt loam--------	ML, CL	A-6, A-7	0	100	100	95-100	90-100	30-45	10-20
	9-54	Silty clay loam, silty clay.	CH, CL	A-7	0	100	100	95-100	90-100	45-70	25-40
	54-60	Silt loam--------	CL	A-6	0	100	100	95-100	90-100	30-40	10-20
45--------------- Denny	0-9	Silt loam--------	CL	A-6, A-4	0	100	100	95-100	95-100	30-40	8-15
	9-17	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	95-100	95-100	25-40	5-15
	17-48	Silty clay loam, silty clay.	CL, CH	A-7, A-6	0	100	100	95-100	95-100	35-60	15-35
	48-60	Silt loam, silty clay loam.	CL	A-6	0	100	100	95-100	95-100	25-40	11-20
49--------------- Watseka	0-27	Loamy sand-------	SM, SM-SC	A-2	0	100	95-100	80-100	17-35	<25	NP-5
	27-60	Fine sand, sand, loamy fine sand.	SP, SM, SP-SM	A-3, A-2	0	90-100	90-100	60-80	3-25	<20	NP-4
50--------------- Virden	0-18	Silty clay loam	CL	A-7, A-6	0	100	100	98-100	95-100	30-45	10-20
	18-48	Silty clay, silty clay loam.	CH, CL, MH, ML	A-7	0	100	100	98-100	95-100	40-55	15-25
	48-60	Silty clay loam, silt loam.	CL	A-7, A-6	0	100	100	98-100	90-100	30-45	10-20
53B, 53D, 53E---- Bloomfield	0-7	Loamy sand-------	SM, SP, SP-SM	A-2-4, A-3	0	100	100	70-90	4-35	---	NP
	7-60	Fine sand, loamy sand, sandy loam.	SP, SM, SP-SM	A-2-4, A-3	0	100	100	70-90	4-35	---	NP
54B, 54D--------- Plainfield	0-9	Loamy sand-------	SM, SP-SM	A-2, A-4, A-1	0	75-100	75-100	40-90	12-40	---	NP
	9-60	Sand-------------	SP, SM, SP-SM	A-3, A-1, A-2	0	75-100	75-100	40-70	1-15	---	NP
68--------------- Sable	0-17	Silty clay loam	CL, CH, ML, MH	A-7	0	100	100	95-100	95-100	41-65	15-35
	17-42	Silty clay loam, silt loam.	CL, CH	A-7	0	100	100	95-100	95-100	40-55	20-35
	42-60	Silt loam, silty clay loam.	CL	A-6	0	100	100	95-100	95-100	30-40	10-20
71--------------- Darwin	0-13	Silty clay-------	CH, CL	A-7	0	100	100	100	90-100	45-85	25-55
	13-42	Silty clay, clay	CH, CL	A-7	0	100	100	100	85-100	45-85	25-55
	42-60	Silty clay loam, silty clay.	CL, CH	A-7, A-6	0	100	100	95-100	90-100	35-70	20-45
73A-------------- Ross	0-16	Loam-------------	ML, CL-ML, CL	A-4, A-6	0	90-100	90-100	80-100	65-95	20-35	NP-12
	16-36	Loam, silt loam, silty clay loam.	ML, CL, CL-ML	A-6, A-4, A-7	0	90-100	85-100	70-100	55-95	22-45	3-20
	36-60	Stratified gravelly loamy sand to silt loam.	CL, ML, SM, GM	A-6, A-4, A-2, A-1	0-5	65-100	55-100	35-100	20-80	<30	NP-12

TABLE 15.--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	
78A------------- Arenzville	0-26	Silt loam--------	ML, CL-ML, CL	A-4	0	100	100	95-100	80-95	20-30	4-10
	26-60	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	90-100	85-95	30-45	10-20
81-------------- Littleton	0-9	Silt loam--------	CL	A-4, A-6	0	100	100	95-100	90-100	25-40	7-20
	9-34	Silt loam--------	CL	A-4, A-6	0	100	100	95-100	90-100	25-40	7-20
	34-60	Silt loam--------	CL-ML, CL	A-4, A-6, A-7	0	100	100	95-100	80-100	20-45	5-20
87-------------- Dickinson	0-8	Sandy loam-------	SM, SC, SM-SC	A-4, A-2	0	100	100	85-95	30-50	15-30	NP-10
	8-47	Fine sandy loam, sandy loam.	SM, SC, SM-SC	A-4	0	100	100	85-95	35-50	15-30	NP-10
	47-60	Loamy sand, loamy fine sand, fine sand.	SM, SP-SM, SM-SC	A-2, A-3	0	100	100	80-95	5-20	10-20	NP-5
88B------------- Sparta	0-18	Loamy sand-------	SM	A-2, A-4	0	85-100	85-100	50-95	15-50	---	NP
	18-37	Loamy 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
107------------- Sawmill	0-33	Silty clay loam	CL	A-6, A-7	0	100	100	95-100	85-100	30-50	15-30
	33-48	Silty clay loam, clay loam, loam.	CL	A-6, A-7, A-4	0	100	100	85-100	70-95	25-50	8-25
	48-60	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
119D2----------- Elco	0-8	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	25-40	5-15
	8-23	Silty clay loam, silt loam.	CL	A-7, A-6	0	100	100	95-100	85-100	25-45	11-30
	23-60	Silty clay loam, loam, clay.	CL	A-7, A-6	0	100	90-100	80-100	60-95	25-50	11-30
119D3----------- Elco	0-5	Silty clay loam	CL	A-6, A-7	0	100	100	95-100	85-100	30-45	15-30
	5-19	Silty clay loam, silt loam.	CL	A-7, A-6	0	100	100	95-100	85-100	25-45	11-30
	19-60	Silty clay loam, loam, clay.	CL	A-7, A-6	0	100	90-100	80-100	60-95	25-50	11-30
119E2----------- Elco	0-8	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	25-40	5-15
	8-23	Silty clay loam, silt loam.	CL	A-7, A-6	0	100	100	95-100	85-100	25-45	11-30
	23-60	Silty clay loam, loam, clay.	CL	A-7, A-6	0	100	90-100	80-100	60-95	25-50	11-30
131B, 131D------- Alvin	0-12	Fine sandy loam	SM, ML	A-4, A-2	0	100	100	80-95	30-60	<25	NP-4
	12-43	Fine sandy loam, sandy loam, sandy clay loam.	SM, SC, CL, ML	A-2, A-4, A-6	0	100	100	90-100	20-80	15-38	NP-13
	43-60	Stratified sandy loam to loamy sand.	SM, SP, SP-SM	A-2, A-3	0-5	95-100	90-100	70-95	4-35	<20	NP-4

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
150B------------- Onarga	0-16	Fine sandy loam	SC, SM, SM-SC	A-4, A-6, A-2	0	100	100	75-95	25-50	<28	NP-12
	16-37	Loam, sandy clay loam, 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
	37-60	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
172A------------- Hoopeston	0-21	Sandy loam-------	SM	A-2, A-4	0	90-100	90-100	70-90	25-45	20-35	NP-10
	21-53	Sandy loam, fine sandy loam.	SM, SC, SM-SC	A-2, A-4	0	90-100	90-100	60-85	25-50	<30	NP-10
	53-60	Loamy sand, sand, fine sand.	SP-SM, SM, SC, SM-SC	A-2, A-3	0	90-100	90-100	50-80	5-20	<25	NP-10
180-------------- Dupo	0-11	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0	100	100	100	95-100	20-35	1-15
	11-26	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	100	95-100	20-35	5-15
	26-60	Silty clay, clay, silty clay loam.	CL, CH	A-7, A-6	0	100	100	100	98-100	35-55	15-30
200-------------- Orio	0-9	Sandy loam-------	SM, SC, SM-SC	A-4, A-2-4	0	100	100	70-85	25-50	15-30	2-10
	9-25	Loam, sandy loam, loamy sand.	SM, SC, ML, CL	A-4, A-2-4	0	100	100	75-90	15-60	<35	2-10
	25-54	Sandy loam, sandy clay loam, clay loam.	CL, SC	A-6, A-7	0	100	100	80-95	35-75	30-45	10-20
	54-60	Sandy clay loam, sandy loam, loamy sand.	SM-SC, SC	A-4, A-2-4, A-6, A-2-6	0	100	100	75-90	15-45	25-35	5-15
242B------------- Kendall	0-19	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	20-35	5-15
	19-57	Silty clay loam	CL	A-6, A-7	0	100	100	95-100	90-100	30-45	10-20
	57-60	Silt loam--------	CL, CL-ML	A-4	0	100	80-95	80-95	80-95	<25	4-10
244-------------- Hartsburg	0-13	Silty clay loam	CL, ML	A-7, A-6	0	100	100	100	95-100	35-50	10-25
	13-49	Silty clay loam	CL, CH	A-7	0	100	100	95-100	95-100	40-55	20-30
	49-60	Silt loam, loam	CL	A-6	0	95-100	90-100	90-100	70-100	25-40	11-20
257A------------- Clarksdale	0-19	Silt loam--------	CL	A-6	0	100	100	95-100	90-100	25-40	10-20
	19-56	Silty clay loam, silty clay.	CH, CL	A-7	0	100	100	95-100	90-100	40-65	25-40
	56-60	Silt loam, silty clay loam.	CL	A-6	0	98-100	98-100	95-100	90-100	25-40	10-25
259C2, 259D2----- Assumption	0-9	Silt loam--------	CL, ML	A-6, A-4	0	100	100	95-100	90-100	25-40	8-20
	9-36	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	95-100	90-100	30-50	10-30
	36-60	Clay loam, loam, silty clay loam.	CL	A-6, A-7	0-5	100	95-100	90-100	70-90	35-50	20-35
279B, 279C2------ Rozetta	0-15	Silt loam--------	CL	A-4, A-6	0	100	100	95-100	95-100	24-35	8-15
	15-39	Silty clay loam	CL	A-7, A-6	0	100	100	95-100	95-100	35-50	15-30
	39-60	Silt loam--------	CL	A-6	0	100	100	95-100	95-100	25-40	10-20
279C3------------ Rozetta	0-5	Silty clay loam	ML, CL	A-6, A-7	0	100	100	95-100	95-100	35-45	10-20
	5-37	Silty clay loam	CL	A-7, A-6	0	100	100	95-100	95-100	35-50	15-30
	37-60	Silt loam--------	CL	A-6	0	100	100	95-100	95-100	25-40	10-20

TABLE 15.--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	
280B, 280C2, 280D2----------- Fayette	0-10	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	100	95-100	25-35	5-15
	10-39	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	100	95-100	35-45	15-25
	39-60	Silt loam--------	CL	A-6	0	100	100	100	95-100	30-40	10-20
280D3------------ Fayette	0-4	Silty clay loam	CL	A-6, A-7	0	100	100	100	95-100	35-45	15-25
	4-41	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	100	95-100	35-45	15-25
	41-60	Silt loam--------	CL	A-6	0	100	100	100	95-100	30-40	10-20
280E2------------ Fayette	0-10	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	100	95-100	25-35	5-15
	10-39	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	100	95-100	35-45	15-25
	39-60	Silt loam--------	CL	A-6	0	100	100	100	95-100	30-40	10-20
284-------------- Tice	0-10	Silt loam--------	CL	A-6, A-7	0	100	100	90-100	80-95	30-45	10-20
	10-37	Silty clay loam, silt loam.	CL, CH	A-7	0	100	100	95-100	85-95	40-55	15-30
	37-60	Stratified silty clay loam to loam.	CL-ML, CL	A-4, A-6, A-7	0	100	100	60-95	55-80	25-45	5-20
288-------------- Petrolia	0-7	Silt loam--------	CL, ML	A-6, A-7, A-4	0	100	95-100	80-95	75-90	30-45	5-20
	7-60	Silty clay loam	ML, CL	A-6, A-7	0	100	95-100	90-100	80-100	35-50	10-25
302-------------- Ambraw	0-16	Clay loam--------	CL	A-6, A-7	0	100	100	85-95	70-95	30-45	10-20
	16-53	Clay loam, sandy clay loam.	CL	A-7, A-6	0	100	100	85-95	50-85	30-50	10-25
	53-60	Stratified 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
333-------------- Wakeland	0-10	Silt loam--------	ML	A-4	0	100	100	90-100	80-90	27-36	4-10
	10-60	Silt loam--------	ML	A-4	0	100	100	90-100	80-90	27-36	4-10
415-------------- Orion	0-16	Silt loam--------	CL, CL-ML	A-4	0	100	100	85-100	80-100	20-30	4-10
	16-32	Stratified silt loam to very fine sand.	CL, CL-ML	A-4	0	100	100	90-100	70-80	20-30	4-10
	32-60	Silt loam, silty clay loam.	CL, CL-ML	A-6, A-4	0	100	100	85-100	85-100	20-40	4-18
451-------------- Lawson	0-11	Silt loam--------	CL, CL-ML	A-4	0	100	100	90-100	85-100	20-30	5-10
	11-35	Silt loam--------	CL, CL-ML	A-4	0	100	100	90-100	85-100	20-30	5-10
	35-60	Silty clay loam, silt loam.	CL	A-6	0	100	100	90-100	60-100	20-40	10-25
533*. Urban land											
567C2------------ Elkhart	0-9	Silt loam--------	CL	A-4, A-6	0	100	100	100	95-100	25-35	8-15
	9-28	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	100	95-100	35-50	18-30
	28-60	Silt loam, silt	CL	A-6, A-4	0	100	100	95-100	95-100	20-37	8-20

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
588. Sparta	0-16	Loamy sand	SM	A-2, A-4	0	85-100	85-100	50-95	15-50	---	NP
	16-38	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
	38-54	Sand, fine sand	SP-SM, SM	A-2, A-3	0	85-100	85-100	50-95	5-30	---	NP
	54-60	Stratified sandy loam to clay loam.	CL, SM-SC, SM	A-6, A-2	2-5	90-95	85-95	70-90	15-75	10-30	NP-20
682A. Medway	0-16	Loam	ML, CL, CL-ML	A-4, A-6	0	100	100	90-100	70-80	20-40	3-15
	16-40	Loam, silt loam, silty clay loam.	ML, CL, CL-ML	A-4, A-6, A-7	0	95-100	80-95	75-90	70-90	20-45	4-20
	40-60	Stratified sandy loam to silty clay loam.	ML, CL, SM-SC, SM	A-4, A-2, A-6	0	90-100	75-100	45-95	25-75	15-30	NP-15
864*. Pits											
915D2*, 915E2*: Elco	0-4	Silt loam	CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	25-40	5-15
	4-28	Silty clay loam, silt loam.	CL	A-7, A-6	0	100	100	95-100	85-100	25-45	11-30
	28-60	Silty clay loam, loam, clay.	CL	A-7, A-6	0	100	90-100	80-100	60-95	25-50	11-30
Ursa	0-6	Silt loam	CL, CL-ML	A-6, A-4	0	100	95-100	90-100	80-100	20-40	5-20
	6-51	Clay, clay loam, silty clay.	CH, CL	A-7, A-6	0-5	95-100	90-95	70-90	55-90	40-60	20-35
	51-60	Clay loam, loam, clay.	CL, CH	A-6, A-7	0-5	95-100	90-95	80-90	60-85	35-55	20-35
962D3*: Sylvan	0-5	Silty clay loam	CL	A-7, A-6	0	100	100	100	95-100	35-50	20-30
	5-21	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	100	95-100	35-50	20-30
	21-60	Silt loam	CL, CL-ML	A-6, A-4	0	100	100	95-100	95-100	20-40	5-20
Bold	0-60	Silt loam	ML, CL, CL-ML	A-4, A-6	0	100	100	100	90-100	20-35	3-15
962E2*: Bold	0-60	Silt loam	ML, CL, CL-ML	A-4, A-6	0	100	100	100	90-100	20-35	3-15
Sylvan	0-4	Silt loam	CL-ML, CL	A-4, A-6	0	100	100	100	95-100	25-35	5-15
	4-17	Silty clay loam	CL	A-6, A-7	0	100	100	100	95-100	35-50	20-30
	17-60	Silt loam	CL, CL-ML	A-6, A-4	0	100	100	95-100	95-100	20-40	5-20
962E3*: Bold	0-60	Silt loam	ML, CL, CL-ML	A-4, A-6	0	100	100	100	90-100	20-35	3-15
Sylvan	0-5	Silty clay loam	CL	A-7, A-6	0	100	100	100	95-100	35-50	20-30
	5-21	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	100	95-100	35-50	20-30
	21-60	Silt loam	CL, CL-ML	A-6, A-4	0	100	100	95-100	95-100	20-40	5-20
2036B*, 2036C*: Tama	0-14	Silt loam	ML	A-6, A-7	0	100	100	100	95-100	35-50	10-20
	14-55	Silty clay loam	CL	A-7	0	100	100	100	95-100	40-50	15-25
	55-60	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	100	95-100	35-45	15-25

See footnote at end of table.

TABLE 15.--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	
2036B*, 2036C*: Urban land.											
2043A*: Ipava	0-9	Silt loam	ML, CL	A-6, A-7	0	100	100	95-100	90-100	30-45	10-20
	9-54	Silty clay loam, silty clay.	CH, CL	A-7	0	100	100	95-100	90-100	45-70	25-40
	54-60	Silt loam	CL	A-6	0	100	100	95-100	90-100	30-40	10-20
Urban land.											
2244*: Hartsburg	0-13	Silty clay loam	CL, ML	A-7, A-6	0	100	100	100	95-100	35-50	10-25
	13-49	Silty clay loam	CL, CH	A-7	0	100	100	95-100	95-100	40-55	20-30
	49-60	Silt loam, loam	CL	A-6	0	95-100	90-100	90-100	70-100	25-40	11-20
Urban land.											
3070, 7070 Beaucoup	0-12	Silty clay loam	CL	A-6, A-7	0	100	100	90-100	85-100	30-45	15-25
	12-33	Silty clay loam	CL	A-6, A-7	0	100	100	90-100	85-100	30-45	15-30
	33-60	Stratified very fine sandy loam to silty clay loam.	CL, CL-ML	A-6, A-7, A-4	0	100	100	90-100	65-95	25-45	5-25

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--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
8E2--------------	0-17	19-25	1.30-1.50	0.6-2.0	0.20-0.22	4.5-7.3	Low----------	0.37	5	6	1-2
Hickory	17-45	27-35	1.45-1.65	0.6-2.0	0.15-0.19	4.5-6.0	Moderate-----	0.37			
	45-60	15-32	1.50-1.70	0.6-2.0	0.11-0.19	5.1-8.4	Low----------	0.37			
8E3--------------	0-6	27-35	1.40-1.65	0.6-2.0	0.17-0.19	4.5-6.0	Moderate-----	0.37	4	4	.5-1
Hickory	6-50	27-35	1.45-1.65	0.6-2.0	0.15-0.19	4.5-6.0	Moderate-----	0.37			
	50-60	15-32	1.50-1.70	0.6-2.0	0.11-0.19	5.1-8.4	Low----------	0.37			
8F---------------	0-17	19-25	1.30-1.50	0.6-2.0	0.20-0.22	4.5-7.3	Low----------	0.37	5	6	1-2
Hickory	17-45	27-35	1.45-1.65	0.6-2.0	0.15-0.19	4.5-7.3	Moderate-----	0.37			
	45-60	15-32	1.50-1.70	0.6-2.0	0.11-0.19	5.1-8.4	Low----------	0.37			
17A--------------	0-13	16-22	1.30-1.40	0.6-2.0	0.22-0.24	4.5-7.3	Low----------	0.37	5	6	1-2
Keomah	13-58	27-42	1.30-1.45	0.2-0.6	0.18-0.20	4.5-5.5	High---------	0.37			
	58-60	24-38	1.40-1.55	0.2-0.6	0.18-0.20	5.1-6.5	Moderate-----	0.37			
19C3-------------	0-6	27-32	1.25-1.45	0.6-2.0	0.20-0.22	5.6-7.3	Moderate-----	0.37	4	7	<1
Sylvan	6-25	25-35	1.30-1.50	0.6-2.0	0.18-0.20	5.6-7.3	Moderate-----	0.37			
	25-60	18-27	1.30-1.50	0.6-2.0	0.20-0.22	6.6-8.4	Low----------	0.37			
19D2-------------	0-10	20-27	1.20-1.40	0.6-2.0	0.20-0.22	5.6-7.3	Low----------	0.37	5	6	1-2
Sylvan	10-27	25-35	1.30-1.50	0.6-2.0	0.18-0.20	5.6-7.3	Moderate-----	0.37			
	27-60	18-27	1.30-1.50	0.6-2.0	0.20-0.22	6.6-8.4	Low----------	0.37			
19D3-------------	0-6	27-32	1.25-1.45	0.6-2.0	0.20-0.22	5.6-7.3	Moderate-----	0.37	4	7	<1
Sylvan	6-25	25-35	1.30-1.50	0.6-2.0	0.18-0.20	5.6-7.3	Moderate-----	0.37			
	25-60	18-27	1.30-1.50	0.6-2.0	0.20-0.22	6.6-8.4	Low----------	0.37			
19E2-------------	0-10	20-27	1.20-1.40	0.6-2.0	0.20-0.22	5.6-7.3	Low----------	0.37	5	6	1-2
Sylvan	10-27	25-35	1.30-1.50	0.6-2.0	0.18-0.20	5.6-7.3	Moderate-----	0.37			
	27-60	18-27	1.30-1.50	0.6-2.0	0.20-0.22	6.6-8.4	Low----------	0.37			
19E3-------------	0-6	27-32	1.25-1.45	0.6-2.0	0.20-0.22	5.6-7.3	Moderate-----	0.37	4	7	<1
Sylvan	6-25	25-35	1.30-1.50	0.6-2.0	0.18-0.20	5.6-7.3	Moderate-----	0.37			
	25-60	18-27	1.30-1.50	0.6-2.0	0.20-0.22	6.6-8.4	Low----------	0.37			
26---------------	0-9	20-25	1.35-1.55	0.2-0.6	0.22-0.24	6.1-8.4	Low----------	0.28	3	6	2-3
Wagner	9-16	18-25	1.35-1.55	0.2-0.6	0.20-0.22	6.1-8.4	Low----------	0.28			
	16-53	35-47	1.35-1.55	<0.06	0.09-0.20	4.5-7.3	High---------	0.28			
	53-60	35-40	1.35-1.55	<0.06	0.18-0.20	6.6-8.4	Moderate-----	0.28			
30F, 30G---------	0-15	6-12	1.20-1.30	0.6-2.0	0.20-0.24	6.6-8.4	Low----------	0.43	5	4L	.5-1
Hamburg	15-60	6-12	1.20-1.30	0.6-2.0	0.17-0.22	7.4-8.4	Low----------	0.43			
36B, 36C2--------	0-14	20-29	1.25-1.30	0.6-2.0	0.22-0.24	5.1-7.3	Moderate-----	0.32	5	7	3-4
Tama	14-55	27-35	1.30-1.35	0.6-2.0	0.18-0.20	5.1-7.3	Moderate-----	0.43			
	55-60	20-30	1.35-1.40	0.6-2.0	0.18-0.20	5.6-7.3	Moderate-----	0.43			
37A, 37B, 37C----	0-29	15-22	1.20-1.40	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.32	5	6	3-4
Worthen	29-60	18-24	1.20-1.40	0.6-2.0	0.20-0.22	5.6-7.3	Low----------	0.43			
43A, 43B---------	0-9	20-30	1.15-1.35	0.6-2.0	0.22-0.24	5.6-7.3	Moderate-----	0.28	5	6	4-5
Ipava	9-54	35-43	1.25-1.50	0.2-0.6	0.11-0.20	5.6-7.8	High---------	0.43			
	54-60	20-27	1.30-1.55	0.2-0.6	0.20-0.22	6.1-8.4	Moderate-----	0.43			

TABLE 16.--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
45----------- Denny	0-9	20-27	1.25-1.45	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.37	3	6	3-4
	9-17	15-22	1.25-1.45	0.2-0.6	0.18-0.20	5.6-6.5	Low----------	0.37			
	17-48	35-45	1.20-1.40	0.06-0.2	0.11-0.22	5.6-6.5	High---------	0.37			
	48-60	25-35	1.40-1.60	0.2-0.6	0.20-0.22	5.6-7.8	Moderate-----	0.37			
49----------- Watseka	0-27	8-13	1.35-1.55	6.0-20	0.10-0.12	5.6-7.3	Low----------	0.17	5	2	1-3
	27-60	1-10	1.70-2.00	6.0-20	0.05-0.10	5.1-7.3	Low----------	0.17			
50----------- Virden	0-18	25-30	1.20-1.40	0.6-2.0	0.21-0.24	5.6-7.8	Moderate-----	0.28	5	4	4-6
	18-48	35-42	1.20-1.45	0.2-0.6	0.11-0.20	5.6-7.8	High---------	0.28			
	48-60	25-33	1.25-1.55	0.2-0.6	0.18-0.22	6.1-8.4	Moderate-----	0.28			
53B, 53D, 53E---- Bloomfield	0-7	5-10	1.50-1.70	6.0-20	0.10-0.12	5.1-7.8	Low----------	0.15	5	2	.5-2
	7-60	2-10	1.60-1.80	6.0-20	0.06-0.11	5.1-7.3	Low----------	0.15			
54B, 54D--------- Plainfield	0-9	3-7	1.50-1.65	2.0-6.0	0.09-0.12	4.5-7.3	Low----------	0.17	5	2	<1
	9-60	0-4	1.50-1.65	6.0-20	0.04-0.07	4.5-6.5	Low----------	0.17			
68----------- Sable	0-17	27-35	1.15-1.35	0.6-2.0	0.21-0.23	5.6-7.3	Moderate-----	0.28	5	6	5-6
	17-42	24-35	1.30-1.50	0.6-2.0	0.18-0.20	5.6-7.8	Moderate-----	0.28			
	42-60	20-28	1.30-1.50	0.6-2.0	0.20-0.22	6.6-8.4	Low----------	0.28			
71----------- Darwin	0-13	35-45	1.20-1.40	<0.06	0.11-0.14	6.1-7.8	Very high----	0.28	3	4	4-5
	13-42	45-60	1.30-1.50	<0.06	0.11-0.14	6.1-7.8	Very high----	0.28			
	42-60	30-55	1.40-1.60	0.06-0.2	0.10-0.20	6.6-8.4	High---------	0.28			
73A---------- Ross	0-16	15-27	1.20-1.45	0.6-2.0	0.19-0.24	6.1-7.8	Low----------	0.32	5	5	3-5
	16-36	18-32	1.20-1.50	0.6-2.0	0.16-0.22	6.1-8.4	Low----------	0.32			
	36-60	5-25	1.35-1.60	0.6-6.0	0.05-0.18	6.1-8.4	Low----------	0.32			
78A---------- Arenzville	0-26	10-18	1.20-1.55	0.6-2.0	0.20-0.24	5.6-7.8	Low----------	0.37	5	5	1-3
	26-60	10-30	1.25-1.45	0.6-2.0	0.18-0.22	5.6-7.8	Moderate-----	0.37			
81----------- Littleton	0-9	18-27	1.25-1.45	0.6-2.0	0.20-0.24	5.6-7.8	Low----------	0.32	5	6	3-4
	9-34	22-27	1.20-1.40	0.6-2.0	0.22-0.24	5.6-7.8	Low----------	0.32			
	34-60	18-27	1.20-1.40	0.6-2.0	0.20-0.22	5.6-7.8	Low----------	0.43			
87----------- Dickinson	0-8	10-18	1.50-1.55	2.0-6.0	0.12-0.15	5.6-7.3	Low----------	0.20	4	3	1-2
	8-47	10-15	1.45-1.55	2.0-6.0	0.12-0.15	5.1-6.5	Low----------	0.20			
	47-60	4-10	1.55-1.65	6.0-20	0.08-0.10	5.1-6.5	Low----------	0.20			
88B---------- Sparta	0-18	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
	18-37	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			
107---------- Sawmill	0-33	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
	33-48	25-35	1.30-1.45	0.6-2.0	0.17-0.20	6.1-7.8	Moderate-----	0.28			
	48-60	18-35	1.35-1.50	0.6-2.0	0.15-0.19	6.1-8.4	Moderate-----	0.28			
119D2-------- Elco	0-8	20-27	1.20-1.35	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.37	4	6	1-3
	8-23	23-35	1.25-1.45	0.6-2.0	0.18-0.21	5.1-7.3	Moderate-----	0.37			
	23-60	25-45	1.40-1.60	0.2-0.6	0.14-0.20	5.1-7.3	Moderate-----	0.37			
119D3-------- Elco	0-5	25-33	1.20-1.35	0.6-2.0	0.18-0.21	5.6-7.3	Moderate-----	0.37	3	7	.5-1
	5-19	23-35	1.25-1.45	0.6-2.0	0.18-0.21	5.1-7.3	Moderate-----	0.37			
	19-60	25-45	1.40-1.60	0.2-0.6	0.14-0.20	5.1-7.3	Moderate-----	0.37			
119E2-------- Elco	0-8	20-27	1.20-1.35	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.37	4	6	1-3
	8-23	23-35	1.25-1.45	0.6-2.0	0.18-0.21	5.1-7.3	Moderate-----	0.37			
	23-60	25-45	1.40-1.60	0.2-0.6	0.14-0.20	5.1-7.3	Moderate-----	0.37			

TABLE 16.--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
131B, 131D------- Alvin	0-12	10-15	1.45-1.65	2.0-6.0	0.14-0.20	5.1-6.5	Low----------	0.24	5	3	.5-1
	12-43	15-18	1.45-1.65	2.0-6.0	0.12-0.20	4.5-6.0	Low----------	0.24			
	43-60	3-10	1.55-1.75	2.0-6.0	0.05-0.13	5.1-7.8	Low----------	0.24			
150B------------ Onarga	0-16	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
	16-37	15-18	1.45-1.70	0.6-2.0	0.15-0.19	4.5-7.3	Low----------	0.20			
	37-60	2-10	1.65-1.90	6.0-20	0.05-0.13	5.1-7.3	Low----------	0.15			
172A------------ Hoopeston	0-21	8-18	1.35-1.70	2.0-6.0	0.12-0.15	5.1-7.3	Low----------	0.20	4	3	2-3
	21-53	12-18	1.45-1.75	2.0-6.0	0.12-0.17	5.1-7.8	Low----------	0.28			
	53-60	2-10	1.50-1.80	6.0-20	0.05-0.10	4.5-8.4	Low----------	0.17			
180-------------- Dupo	0-11	10-18	1.25-1.45	0.6-2.0	0.22-0.24	5.6-8.4	Low----------	0.37	5	5	1-2
	11-26	10-18	1.30-1.50	0.6-2.0	0.20-0.22	5.6-8.4	Low----------	0.37			
	26-60	35-45	1.35-1.60	0.06-0.2	0.08-0.19	6.6-7.8	High---------	0.37			
200-------------- Orio	0-9	8-18	1.30-1.50	2.0-6.0	0.13-0.15	4.5-7.8	Low----------	0.20	5	3	1-2
	9-25	6-20	1.30-1.50	0.6-2.0	0.09-0.18	4.5-7.8	Low----------	0.28			
	25-54	18-30	1.40-1.60	0.2-0.6	0.12-0.19	4.5-7.8	Moderate-----	0.28			
	54-60	10-22	1.50-1.70	0.6-2.0	0.09-0.17	4.5-7.8	Low----------	0.28			
242B------------ Kendall	0-19	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
	19-57	27-35	1.30-1.50	0.6-2.0	0.18-0.20	4.5-7.3	Moderate-----	0.37			
	57-60	10-25	1.55-1.70	0.6-2.0	0.11-0.22	5.6-8.4	Low----------	0.37			
244-------------- Hartsburg	0-13	23-33	1.15-1.35	0.6-2.0	0.21-0.24	6.1-7.8	Moderate-----	0.28	5	4	3-5
	13-49	27-35	1.20-1.50	0.6-2.0	0.18-0.20	6.6-7.8	Moderate-----	0.28			
	49-60	20-27	1.30-1.55	0.6-2.0	0.20-0.22	7.4-8.4	Low----------	0.28			
257A------------ Clarksdale	0-19	20-27	1.25-1.50	0.6-2.0	0.22-0.24	5.1-6.0	Moderate-----	0.37	5	6	2-3
	19-56	35-42	1.30-1.50	0.2-0.6	0.11-0.20	5.1-7.3	High---------	0.37			
	56-60	20-30	1.40-1.60	0.2-0.6	0.20-0.22	6.1-8.4	Moderate-----	0.37			
259C2, 259D2----- Assumption	0-9	20-27	1.10-1.30	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.32	4	6	3-4
	9-36	25-35	1.20-1.40	0.6-2.0	0.18-0.22	5.1-7.3	Moderate-----	0.43			
	36-60	30-45	1.40-1.65	0.2-0.6	0.14-0.20	5.1-7.3	Moderate-----	0.43			
279B, 279C2------ Rozetta	0-15	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
	15-39	27-35	1.35-1.55	0.6-2.0	0.18-0.20	5.1-6.0	Moderate-----	0.37			
	39-60	20-27	1.40-1.60	0.6-2.0	0.20-0.22	5.6-7.8	Low----------	0.37			
279C3----------- Rozetta	0-5	27-35	1.30-1.50	0.6-2.0	0.20-0.22	5.1-7.3	Moderate-----	0.37	4	7	.5-1
	5-37	27-35	1.35-1.55	0.6-2.0	0.18-0.20	5.1-6.0	Moderate-----	0.37			
	37-60	20-27	1.40-1.60	0.6-2.0	0.20-0.22	5.6-7.8	Low----------	0.37			
280B, 280C2, 280D2----------- Fayette	0-10	15-25	1.30-1.35	0.6-2.0	0.20-0.22	5.1-7.3	Low----------	0.37	5	6	1-2
	10-39	25-35	1.30-1.45	0.6-2.0	0.18-0.20	4.5-7.3	Moderate-----	0.37			
	39-60	22-26	1.45-1.50	0.6-2.0	0.18-0.20	5.1-7.8	Moderate-----	0.37			
280D3----------- Fayette	0-4	25-32	1.35-1.45	0.6-2.0	0.18-0.20	5.1-7.3	Moderate-----	0.37	4	7	0-.5
	4-41	25-35	1.30-1.45	0.6-2.0	0.18-0.20	4.5-6.0	Moderate-----	0.37			
	41-60	22-26	1.45-1.50	0.6-2.0	0.18-0.20	5.1-7.8	Moderate-----	0.37			
280E2----------- Fayette	0-10	15-25	1.30-1.35	0.6-2.0	0.20-0.22	5.1-7.3	Low----------	0.37	5	6	1-2
	10-39	25-35	1.30-1.45	0.6-2.0	0.18-0.20	4.5-6.0	Moderate-----	0.37			
	39-60	22-26	1.45-1.50	0.6-2.0	0.18-0.20	5.1-7.8	Moderate-----	0.37			
284-------------- Tice	0-10	22-35	1.25-1.45	0.6-2.0	0.21-0.24	6.1-7.8	Moderate-----	0.32	5	7	2-3
	10-37	22-35	1.30-1.50	0.6-2.0	0.18-0.21	5.6-7.8	Moderate-----	0.32			
	37-60	15-30	1.40-1.60	0.6-2.0	0.11-0.18	5.6-7.8	Moderate-----	0.32			

TABLE 16.--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
288----------- Petrolia	0-7	20-27	1.25-1.45	0.2-0.6	0.22-0.24	5.6-8.4	Low----------	0.32	5	6	2-3
	7-60	27-35	1.35-1.45	0.2-0.6	0.18-0.20	6.1-7.3	Moderate-----	0.32			
302----------- Ambraw	0-16	27-35	1.40-1.60	0.6-2.0	0.17-0.23	5.6-7.3	Moderate-----	0.28	5	6	2-3
	16-53	24-35	1.45-1.65	0.2-0.6	0.15-0.19	5.1-7.3	Moderate-----	0.28			
	53-60	18-30	1.50-1.70	0.2-2.0	0.11-0.22	6.1-8.4	Low----------	0.28			
333----------- Wakeland	0-10	10-17	1.30-1.50	0.6-2.0	0.22-0.24	5.6-7.8	Low----------	0.37	5	5	1-3
	10-60	10-17	1.30-1.50	0.6-2.0	0.20-0.22	5.6-7.3	Low----------	0.37			
415----------- Orion	0-16	10-18	1.20-1.30	0.6-2.0	0.22-0.24	5.6-7.8	Low----------	0.37	5	5	1-3
	16-32	10-18	1.20-1.30	0.6-2.0	0.20-0.22	5.6-7.8	Low----------	0.37			
	32-60	10-30	1.25-1.45	0.6-2.0	0.18-0.22	5.6-7.8	Low----------	0.37			
451----------- Lawson	0-11	10-20	1.20-1.55	0.6-2.0	0.22-0.24	6.1-7.8	Low----------	0.28	5	5	3-5
	11-35	10-20	1.20-1.55	0.6-2.0	0.20-0.22	6.1-7.8	Low----------	0.28			
	35-60	18-30	1.55-1.65	0.6-2.0	0.18-0.20	6.1-7.8	Moderate-----	0.43			
533*. Urban land											
567C2---------- Elkhart	0-9	20-27	1.15-1.35	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.32	5	6	2-4
	9-28	25-35	1.25-1.45	0.6-2.0	0.18-0.20	5.6-8.4	Moderate-----	0.43			
	28-60	20-27	1.35-1.55	0.6-2.0	0.20-0.22	7.4-8.4	Low----------	0.43			
588----------- Sparta	0-16	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
	16-38	2-8	1.40-1.60	6.0-20.0	0.05-0.11	5.1-6.0	Low----------	0.17			
	38-54	0-5	1.50-1.70	6.0-20.0	0.04-0.07	5.1-6.0	Low----------	0.17			
	54-60	18-24	1.55-1.80	0.6-2.0	0.10-0.16	5.6-6.5	Low----------	0.37			
682A----------- Medway	0-16	18-27	1.20-1.45	0.6-2.0	0.17-0.22	6.1-7.8	Low----------	0.32	5	6	3-6
	16-40	18-32	1.20-1.50	0.6-2.0	0.14-0.18	6.1-8.4	Low----------	0.32			
	40-60	5-30	1.20-1.60	0.6-6.0	0.11-0.15	6.1-8.4	Low----------	0.32			
864*. Pits											
915D2*, 915E2*:											
Elco-----------	0-4	20-27	1.20-1.35	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.37	4	6	1-3
	4-28	23-35	1.25-1.45	0.6-2.0	0.18-0.21	5.1-7.3	Moderate-----	0.37			
	28-60	25-45	1.40-1.60	0.2-0.6	0.14-0.20	5.1-7.3	Moderate-----	0.37			
Ursa-----------	0-6	15-27	1.30-1.50	0.6-2.0	0.20-0.24	4.5-7.3	Low----------	0.43	4	6	1-3
	6-51	35-45	1.50-1.70	0.06-0.2	0.09-0.17	4.5-7.3	High---------	0.32			
	51-60	25-45	1.55-1.75	0.2-0.6	0.08-0.18	5.6-7.8	Moderate-----	0.32			
962D3*:											
Sylvan----------	0-5	27-32	1.25-1.45	0.6-2.0	0.20-0.22	5.6-7.3	Moderate-----	0.37	4	7	<1
	5-21	25-35	1.30-1.50	0.6-2.0	0.18-0.20	5.6-7.3	Moderate-----	0.37			
	21-60	18-27	1.30-1.50	0.6-2.0	0.20-0.22	6.6-8.4	Low----------	0.37			
Bold-----------	0-60	12-18	1.10-1.30	0.6-2.0	0.20-0.24	7.4-8.4	Low----------	0.43	5-4	4L	.5-2
962E2*:											
Bold-----------	0-60	12-18	1.10-1.30	0.6-2.0	0.20-0.24	7.4-8.4	Low----------	0.43	5-4	4L	.5-2
Sylvan----------	0-4	20-27	1.20-1.40	0.6-2.0	0.20-0.22	5.6-7.3	Low----------	0.37	5	6	1-2
	4-17	25-35	1.30-1.50	0.6-2.0	0.18-0.20	5.6-7.3	Moderate-----	0.37			
	17-60	18-27	1.30-1.50	0.6-2.0	0.20-0.22	6.6-8.4	Low----------	0.37			
962E3*:											
Bold-----------	0-60	12-18	1.10-1.30	0.6-2.0	0.20-0.24	7.4-8.4	Low----------	0.43	5-4	4L	.5-2

See footnote at end of table.

TABLE 16.--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
962E3*:											
Sylvan----------	0-5	27-32	1.25-1.45	0.6-2.0	0.20-0.22	5.6-7.3	Moderate-----	0.37	4	7	<1
	5-21	25-35	1.30-1.50	0.6-2.0	0.18-0.20	5.6-7.3	Moderate-----	0.37			
	21-60	18-27	1.30-1.50	0.6-2.0	0.20-0.22	6.6-8.4	Low----------	0.37			
2036B*, 2036C*:											
Tama------------	0-14	20-29	1.25-1.30	0.6-2.0	0.22-0.24	5.1-7.3	Moderate-----	0.32	5	7	3-4
	14-55	27-35	1.30-1.35	0.6-2.0	0.18-0.20	5.1-6.5	Moderate-----	0.43			
	55-60	20-30	1.35-1.40	0.6-2.0	0.18-0.20	5.6-7.3	Moderate-----	0.43			
Urban land.											
2043A*:											
Ipava-----------	0-9	20-30	1.15-1.35	0.6-2.0	0.22-0.24	5.6-7.3	Moderate-----	0.28	5	6	4-5
	9-54	35-43	1.25-1.50	0.2-0.6	0.11-0.20	5.6-7.8	High---------	0.43			
	54-60	20-27	1.30-1.55	0.2-0.6	0.20-0.22	6.1-8.4	Moderate-----	0.43			
Urban land.											
2244*:											
Hartsburg-------	0-13	23-33	1.15-1.35	0.6-2.0	0.21-0.24	6.1-7.8	Moderate-----	0.28	5	4	3-5
	13-49	27-35	1.20-1.50	0.6-2.0	0.18-0.20	6.6-7.8	Moderate-----	0.28			
	49-60	20-27	1.30-1.55	0.6-2.0	0.20-0.22	7.4-8.4	Low----------	0.28			
Urban land.											
3070, 7070------- Beaucoup	0-12	27-35	1.25-1.45	0.2-0.6	0.21-0.23	5.6-7.8	Moderate-----	0.32	5	7	5-6
	12-33	27-35	1.30-1.50	0.2-0.6	0.18-0.20	5.6-7.8	Moderate-----	0.32			
	33-60	15-30	1.35-1.55	0.2-0.6	0.18-0.22	5.6-7.8	Moderate-----	0.32			

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--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					
8E2, 8E3, 8F: Hickory	C	None	---	---	>6.0	---	---	Moderate	Moderate	Moderate.
17A: Keomah	C	None	---	---	2.0-4.0	Apparent	Mar-Jul	High	High	Moderate.
19C3, 19D2, 19D3, 19E2, 19E3: Sylvan	B	None	---	---	>6.0	---	---	High	Moderate	Moderate.
26: Wagner	D	Rare	---	---	0-2.0	Apparent	Mar-Jun	Moderate	High	High.
30F, 30G: Hamburg	B	None	---	---	>6.0	---	---	High	Low	Low.
36B, 36C2: Tama	B	None	---	---	4.0-6.0	Apparent	Mar-May	High	Moderate	Moderate.
37A, 37B, 37C: Worthen	B	None	---	---	>6.0	---	---	High	Low	Low.
43A, 43B: Ipava	B	None	---	---	1.0-3.0	Apparent	Mar-Jun	High	High	Moderate.
45: Denny	D	None	---	---	+.5-2.0	Apparent	Mar-Jun	High	High	Moderate.
49: Watseka	B	None	---	---	1.0-3.0	Apparent	Feb-May	Moderate	Low	High.
50: Virden	B/D	None	---	---	+.5-2.0	Apparent	Mar-Jun	High	High	Moderate.
53B, 53D, 53E: Bloomfield	A	None	---	---	>6.0	---	---	Low	Low	High.
54B, 54D: Plainfield	A	None	---	---	>6.0	---	---	Low	Low	High.
68: Sable	B/D	None	---	---	+.5-2.0	Apparent	Mar-Jun	High	High	Low.
71: Darwin	D	Rare	---	---	+1-2.0	Apparent	Jan-Jun	Moderate	High	Low.
73A: Ross	B	Frequent	Very brief	Mar-Jun	4.0-6.0	Apparent	Feb-Apr	Moderate	Low	Low.
78A: Arenzville	B	Frequent	Brief	Mar-Jun	3.0-6.0	Apparent	Mar-Jun	High	Moderate	Moderate.
81: Littleton	B	Rare	---	---	1.0-3.0	Apparent	Apr-Jun	High	High	Low.
87: Dickinson	B	None	---	---	>6.0	---	---	Moderate	Low	Moderate.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months		Uncoated steel	Concrete
					Ft					
88B----------------- Sparta	A	None---------	---	---	>6.0	---	---	Low------	Low------	Moderate.
107----------------- Sawmill	B/D	Frequent----	Brief-----	Mar-Jun	0-2.0	Apparent	Mar-Jun	High-----	High-----	Low.
119D2, 119D3, 119E2------------ Elco	B	None---------	---	---	2.5-4.5	Perched	Mar-May	High-----	High-----	Moderate.
131B, 131D--------- Alvin	B	None---------	---	---	>6.0	---	---	Moderate	Low------	High.
150B---------------- Onarga	B	None---------	---	---	>6.0	---	---	Moderate	Low------	High.
172A---------------- Hoopeston	B	None---------	---	---	1.0-3.0	Apparent	Mar-Jun	High-----	Low------	Moderate.
180----------------- Dupo	C	Rare---------	---	---	1.5-3.5	Apparent	Mar-Jun	High-----	High-----	Moderate.
200----------------- Orio	B/D	None---------	---	---	+.5-1.0	Apparent	Mar-Jun	High-----	High-----	Moderate.
242B---------------- Kendall	B	None---------	---	---	1.0-3.0	Apparent	Mar-Jun	High-----	High-----	Moderate.
244----------------- Hartsburg	B/D	None---------	---	---	+.5-2.0	Apparent	Mar-Jun	High-----	High-----	Low.
257A---------------- Clarksdale	C	None---------	---	---	1.0-3.0	Apparent	Mar-Jun	High-----	High-----	Moderate.
259C2, 259D2------- Assumption	B	None---------	---	---	2.5-4.5	Perched	Feb-May	High-----	High-----	Moderate.
279B, 279C2, 279C3------------- Rozetta	B	None---------	---	---	4.0-6.0	Apparent	Mar-Jun	High-----	Moderate	Moderate.
280B, 280C2, 280D2, 280D3, 280E2------------ Fayette	B	None---------	---	---	>6.0	---	---	High-----	Moderate	Moderate.
284----------------- Tice	B	Rare---------	---	---	1.5-3.0	Apparent	Mar-Jun	High-----	High-----	Low.
288----------------- Petrolia	C/D	Rare---------	---	---	+.5-3.0	Apparent	Apr-Jun	High-----	High-----	Low.
302----------------- Ambraw	B/D	Rare---------	---	---	0-2.0	Apparent	Mar-Jun	High-----	High-----	Moderate.
333----------------- Wakeland	C	Frequent----	Brief-----	Feb-May	1.0-3.0	Apparent	Feb-Apr	High-----	High-----	Low.
415----------------- Orion	C	Frequent----	Brief-----	Mar-Jun	1.0-3.0	Apparent	Feb-May	High-----	High-----	Low.
451----------------- Lawson	C	Frequent----	Brief-----	Mar-Jun	1.0-3.0	Apparent	Feb-May	High-----	Moderate	Low.

TABLE 17.--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					
533*. Urban land										
567C2 Elkhart	B	None	---	---	>6.0	---	---	High	Moderate	Moderate.
588 Sparta	A	None	---	---	>6.0	---	---	Low	Low	Moderate.
682A Medway	B	Rare	---	---	1.5-3.0	Apparent	Feb-Apr	High	High	Low.
864*. Pits										
915D2*, 915E2*:										
Elco	B	None	---	---	2.5-4.5	Perched	Mar-May	High	High	Moderate.
Ursa	C	None	---	---	>6.0	---	---	Moderate	High	Moderate.
962D3*:										
Sylvan	B	None	---	---	>6.0	---	---	High	Moderate	Moderate.
Bold	B	None	---	---	>6.0	---	---	High	Low	Low.
962E2*, 962E3*:										
Bold	B	None	---	---	>6.0	---	---	High	Low	Low.
Sylvan	B	None	---	---	>6.0	---	---	High	Moderate	Moderate.
2036B*:										
Tama	B	None	---	---	4.0-6.0	Apparent	Mar-May	High	Moderate	Moderate.
Urban land.										
2036C*:										
Tama	B	None	---	---	4.0-6.0	Apparent	Nov-Jun	High	Moderate	Moderate.
Urban land.										
2043A*:										
Ipava	B	None	---	---	1.0-3.0	Apparent	Mar-Jun	High	High	Moderate.
Urban land.										
2244*:										
Hartsburg	B/D	None	---	---	+.5-2.0	Apparent	Mar-Jun	High	High	Low.
Urban land.										
3070 Beaucoup	B/D	Frequent	Brief	Mar-Jun	+.5-2.0	Apparent	Mar-Jun	High	High	Low.
7070 Beaucoup	B/D	Rare	---	---	+.5-2.0	Apparent	Mar-Jun	High	High	Low.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 18.--ENGINEERING INDEX TEST DATA

(Dashes indicate that data were not available. MAX means maximum dry density; OPT, optimum moisture; LL, liquid limit; PI, plasticity index; UN, Unified; and NP, nonplastic)

Soil name and location	Sample number	Horizon	Depth	Moisture density		Percentage passing sieve--				LL	PI	Classification	
				MAX	OPT	No. 4	No. 10	No. 40	No. 200			AASHTO	UN
			In	Lb/ft^3	Pct					Pct			
Bloomfield loamy sand: 1,145 feet south and 932 feet west of the northeast corner of sec. 2, T. 13 N., R. 13 W.	78IL-171-41-5	E&Bt	31-60	106	14	---	100	99	7	---	NP	A-3	SP-SM
Elco silt loam: 2,100 feet south and 127 feet west of the northeast corner of sec. 28, T. 13 N., R. 8 W.	79IL-137-145-4	2Bt3	20-35	109	17	100	99	96	86	35	17	A-6	CL
Hamburg silt loam: 1,200 feet north and 22 feet east of the southwest corner of sec. 28, T. 15 N., R. 13 W.	78IL-171-29-2	A1	6-11	106	17	100	100	99	97	29	4	A-4	ML
	29-4	C	45-60	108	16	95	94	94	92	27	3	A-4	ML
Ipava silt loam: 96 feet west and 2,250 feet south of the center of sec. 23, T. 15 N., R. 10 W.	80IL-137-81-5	Bt3	29-38	99	22	100	100	99	98	47	28	A-7-6	CL
	81-7	C	46-60	109	17	---	100	100	99	31	10	A-6	CL
Keomah silt loam: 2,180 feet south and 102 feet west of the center of sec. 27, T. 13 N., R. 8 W.	78IL-137-2-2	E	9-13	109	16	100	100	98	96	24	3	A-4	ML
	2-5	Bt2	28-35	97	24	---	100	100	99	49	28	A-7-6	CL
	2-8	C	58-70	110	17	100	100	99	97	34	13	A-6	CL
Orion silt loam: 1,360 feet south and 1,060 feet east of the northwest corner of sec. 8, T. 16 N., R. 10 W.	79IL-137-14-2, 3	A1, A2	5-16	101	19	---	100	100	98	35	6	A-4	ML
	14-4, 5	C	16-32	104	17	---	100	100	99	30	5	A-4	ML
	14-6, 7, 8	Ab	32-60	108	17	---	100	100	99	31	9	A-4	CL
Plainfield loamy sand: 685 feet south and 935 feet west of the center of sec. 27, T. 14 N., R. 13 W.	79IL-137-3-2	Bw	9-17	106	10	---	100	89	6	---	NP	A-3	SP-SM
	3-3, 4	C	17-60	112	11	---	100	92	4	---	NP	A-3	SP

TABLE 18.--ENGINEERING INDEX TEST DATA--Continued

Soil name and location	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/ft3	Pct					Pct			
Rozetta silt loam:	80IL-137-												
1,460 feet east and	78-4, 5, 6	Bt2, Bt3	15-29	101	21	---	100	99	99	43	22	A-7-6	CL
700 feet south of	78-8	Bt4, BC,	29-60	106	19	---	100	100	99	33	10	A-6	CL
the northwest		C											
corner of sec. 12,													
T. 16 N., R. 11 W.													
Ursa silt loam:	78IL-137-												
2,020 feet north	18-2, 3	2Bt1, 2Bt2	6-25	100	19	97	95	88	79	43	27	A-7-6	CL
and 260 feet west	18-4	2Bt3	25-31	105	17	100	98	88	77	39	23	A-6	CL
of the center of	18-5	2Btg	31-51	108	15	97	96	83	73	36	21	A-6	CL
sec. 34, T. 13 N.,													
R. 8 W.													
Worthen silt loam:	79IL-171-												
1,858 feet south	43-2	A1	10-20	104	19	---	100	100	95	32	8	A-4	CL
and 160 feet east	43-5	Bw2	40-52	109	18	---	100	100	98	32	9	A-4	CL
of the northwest													
corner of sec. 34,													
T. 14 N., R. 13 W.													

TABLE 19.--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
Arenzville	Coarse-silty, mixed, nonacid, mesic Typic Udifluvents
*Assumption	Fine-silty, mixed, mesic Typic Argiudolls
Beaucoup	Fine-silty, mixed, mesic Fluvaquentic Haplaquolls
Bloomfield	Sandy, mixed, mesic Psammentic Hapludalfs
Bold	Coarse-silty, mixed (calcareous), mesic Typic Udorthents
Clarksdale	Fine, montmorillonitic, mesic Udollic Ochraqualfs
Darwin	Fine, montmorillonitic, mesic Vertic Haplaquolls
Denny	Fine, montmorillonitic, mesic Mollic Albaqualfs
Dickinson	Coarse-loamy, mixed, mesic Typic Hapludolls
Dupo	Coarse-silty over clayey, mixed, nonacid, mesic Aquic Udifluvents
Elco	Fine-silty, mixed, mesic Typic Hapludalfs
*Elkhart	Fine-silty, mixed, mesic Typic Argiudolls
Fayette	Fine-silty, mixed, mesic Typic Hapludalfs
Hamburg	Coarse-silty, mixed (calcareous), mesic Typic Udorthents
Hartsburg	Fine-silty, mixed, mesic Typic Haplaquolls
Hickory	Fine-loamy, mixed, mesic Typic Hapludalfs
Hoopeston	Coarse-loamy, mixed, mesic Aquic Hapludolls
Ipava	Fine, montmorillonitic, mesic Aquic Argiudolls
*Kendall	Fine-silty, mixed, mesic Aeric Ochraqualfs
Keomah	Fine, montmorillonitic, mesic Aeric Ochraqualfs
Lawson	Fine-silty, mixed, mesic Cumulic Hapludolls
Littleton	Fine-silty, mixed, mesic Cumulic Hapludolls
Medway	Fine-loamy, mixed, mesic Fluvaquentic Hapludolls
Onarga	Coarse-loamy, mixed, mesic Typic Argiudolls
Orio	Fine-loamy, mixed, mesic Mollic Ochraqualfs
Orion	Coarse-silty, mixed, nonacid, mesic Aquic Udifluvents
*Petrolia	Fine-silty, mixed, nonacid, mesic Typic Fluvaquents
Plainfield	Mixed, mesic Typic Udipsamments
*Ross	Fine-loamy, mixed, mesic Cumulic Hapludolls
Rozetta	Fine-silty, mixed, mesic Typic Hapludalfs
Sable	Fine-silty, mixed, mesic Typic Haplaquolls
Sawmill	Fine-silty, mixed, mesic Cumulic Haplaquolls
Sparta	Sandy, mixed, mesic Entic Hapludolls
Sylvan	Fine-silty, mixed, mesic Typic Hapludalfs
Tama	Fine-silty, mixed, mesic Typic Argiudolls
Tice	Fine-silty, mixed, mesic Fluvaquentic Hapludolls
Ursa	Fine, montmorillonitic, mesic Typic Hapludalfs
Virden	Fine, montmorillonitic, mesic Typic Argiaquolls
Wagner	Fine, montmorillonitic, mesic Mollic Albaqualfs
Wakeland	Coarse-silty, mixed, nonacid, mesic Aeric Fluvaquents
Watseka	Sandy, mixed, mesic Aquic Hapludolls
Worthen	Fine-silty, mixed, mesic Cumulic Hapludolls

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