United States
Department of
Agriculture

Natural
Resources
Conservation
Service

In cooperation with
Ohio Department of
Natural Resources,
Division of Soil and Water
Conservation; Ohio
Agricultural Research
and Development Center;
Ohio State University
Extension;
Henry Soil and Water
Conservation District; and
Henry County Commissioners

Soil Survey of Henry County, Ohio

Supplement
July 2005

How to use this survey

General Soil Map

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

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

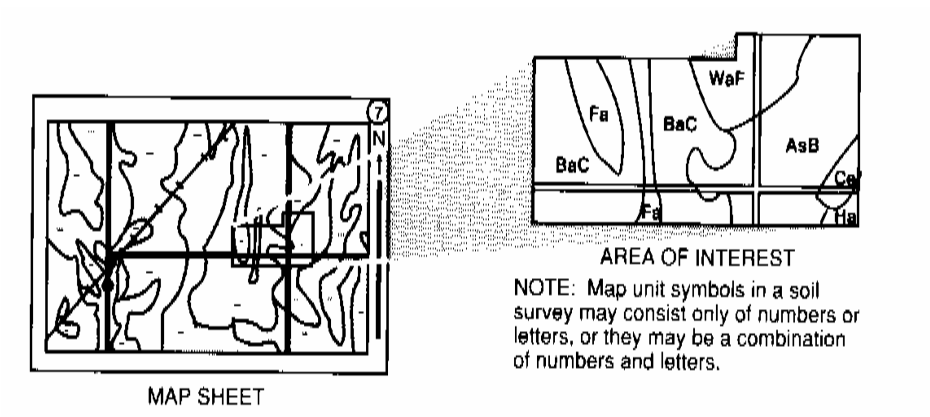
Detailed Soil Maps

The detailed soil maps are currently available in the 1974 Henry County Soil Survey. Directions on how to locate soils of interest are located inside the front cover of the 1974 publication..

Detailed soil maps will soon be able to be generated with geographic information system software from the Natural Resources Conservation Service's Soil Data Mart Website (http://soildatamart.nrcs.usda.gov/Survey.aspx?State=OH). These maps are useful in planning the use and management of small areas.

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

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



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

Major fieldwork for this soil survey was completed in 1966. Soil names and descriptions were approved in 1968. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1966. The 1974 survey was made cooperatively by the Natural Resources Conservation Service, Ohio Department of Natural Resources, Division of Soil and Water Conservation, Ohio Agricultural Research and Development Center, the Ohio State University Extension, the Henry Soil and Water Conservation District and the Henry County Commissioners. This survey is part of the technical assistance furnished to the Henry Soil and Water Conservation District.

Soil maps, referred to in this publication, 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.

Cover: This barn was chosen as the county's bicentennial barn for the 200th anniversary of Ohio in 2003 . In the foregound is a field of tomatoes on the Millgrove soil series.

Contents

Preface

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

This soil survey is designed for many different users. Farmers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and homebuyers 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.

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

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

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

Soil Survey of Henry County, Ohio

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Soil Conservation Service, in Cooperation with The Ohio Department of Natural Resources, Division of Lands and Soil, and The Ohio Agricultural Research and Development Center

Henry County is in the northwestern part of Ohio (fig. 1). It has a total area of approximately 416 square miles, or 266,240 acres. Napoleon, the county seat and largest community, is on the banks of the Maumee River, somewhat northwest of the geographical center of the county. Smaller towns are Deshler, Hamler, Holgate, Liberty Center, Malinta, McClure, and Ridgeville Corners. In 2000, the population of the county was 29,210 and the population of Napoleon was 9,318.

Figure 1. Location of Henry County in Ohio.

The county lies entirely within an area called the Glacial Lake Plain. It is typified by large areas of level or nearly level soils, which are broken only by sand ridges formed during the glacial period and by slope breaks along the rivers and streams. The elevation ranges from 625 feet above sea level where the Maumee River enters Wood County to 750 feet about 2 miles northwest of Ridgeville Corners.

Most of Henry County is used for farming. Industry, especially food processing, provides many jobs off the farm. Cash-grain farming is dominant in the county, but dairying, steer feeding, producing hogs, and producing eggs also are important. Carrots and tomatoes are the commonly grown specialty crops.

General Nature of the County

Climate

Prepared by the Natural Resources Conservation Service National Water and Climate Center, Portland, Oregon.

Climate Tables are created from the climate station in Defiance, Ohio.

Thunderstorm days, relative humidity, percent sunshine, and wind information are estimated from the First Order station in Toledo, Ohio and Fort Wayne, Indiana.

Temperature and precipitation data for the survey area as recorded at Defiance covers the period 1936 to 2005. Table 1 (p. 280) gives data on temperature and precipitation for the survey area for the period 1971 to 2000. Table 2 (p. 281) shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 (p.281) provides data on the length of the growing season.

In winter, the average temperature is 26.1 degrees F and the average daily minimum temperature is 17.9 degrees. The lowest temperature on record, which occurred at Defiance on January 17, 1982, is -22 degrees. In summer, the average temperature is 71.0 degrees and the average daily maximum temperature is 82.5 degrees. The highest temperature, which occurred at Defiance on July 15, 1936, is 106 degrees.

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

The average annual total precipitation is about 35.59 inches. Of this, about 23.6 inches, or 66 percent, usually falls in April through October. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period of record was 4.10 inches at Defiance on April 23, 1977. Thunderstorms occur on about 37 days each year, and most occur in June.

The average seasonal snowfall is 21.8 inches. The greatest snow depth at any one time during the period of record was 21 inches recorded on February 5, 1978. On an average, 40 days per year have at least 1 inch of snow on the ground. The heaviest 1-day snowfall on record was 12 inches recorded on December 20, 1973.

The average relative humidity in mid-afternoon is about 67 percent. Humidity is higher at night, and the average at dawn is about 84 percent. During the summer the sun shines 64 percent of the time around Toledo, OH and 74 percent of the time around Fort Wayne, IN. During the winter the sun shines 41 percent of the time near Toledo, OH and 45 percent around Fort Wayne, IN. The prevailing wind is from the West Southwest to Southwest. Average wind speed is highest, 11.9 miles per hour, in March. Average wind speed is higher near Fort Wayne, IN than near Toledo, OH.

History

Henry County was organized in 1820, 18 years after Ohio was admitted to the Union as a state. The county, named for Patrick Henry, originally embraced all of what is now Fulton County and also part of Lucas and Defiance Counties. Napoleon was named the county seat in 1834.

Settlement was later on lands farther north, south, and west, partly because of Native American opposition but mostly because of the nearly impassable "Black Swamp" that covered all of the county south of the Maumee River (Kaatz, 1955). Early settlers located on land along the streams and creeks. Little progress was made in settling the rest of the county until methods of draining the swamp were developed around the time of the Civil War. At first the wet areas were drained by open ditches and wooden drains, but later clay and concrete tile lines replaced the wooden drains and now most of the clay and concrete tiles have been replaced with plastic tile lines.

Figure 2. The insallation of plastic drainage tile using a tile plow is a common practice.

Natural Resources

One of the most valuable natural resources in Henry County is the soils. The county has many kinds of soils that range from some that are well suited to farming to some that are not suited to farming.

Other resource materials are of minor to moderate importance. Gravel deposits, rather limited in size, occur at some locations on the beach ridges and stream terraces. The largest deposit of gravel is at the bottom of the Maumee River and can be obtained by dredging. Extensive deposits of sand occur in the northeastern part of the county.

Geology

Henry County lies entirely within the lake plain formed by the glacial lakes that were dammed up by retreating glaciers. This flat plain was covered by four ancient lakes, the Lakes Maumee, Whittlesey, Arkona, and Warren. These lakes formed sandy ridges along their shores and offshore bars. The shorelines of Lakes Maumee, Whittlesey, and Arkona are marked by only one or two beach ridges. The water level of Lake Warren, however, fluctuated, and several shorelines were formed. This resulted in the creation of the numerous ridges and off- shore bars that occur in the northeastern part of Henry County (Carman, 1946; Forsyth, 1959).

Before the glacial lakes formed, the county was glaciated. Glacial ice sheets moved southward across Henry County and the western part of Ohio. The last ice sheet, the Wisconsin, covered and obliterated observable evidence of earlier glaciers. The thickness of the ice-deposited material, called glacial drift or till, ranges from about 15 feet, near Paugh Quarry at the Wood County line, to about 125 feet, northwest of Ridgeville Corners in Ridgeville Township. The average thickness of the glacial till is about 50 feet over much of the county.

Within the areas covered by glacial Lake Warren and Lake Maumee (soil associations 3, 4, 5, 7, and 10 on the general soil map) are both lacustrine and outwash deposits. These deposits, ranging from sands to silty clay or clay, are from 2 to 30 feet thick over the glacial till.

This mantle of glacial drift and lacustrine materials has buried the bedrock, which consists of calcareous sedimentary limestone and shale. Geologists classify Henry County bedrock into two systems of the Paleozoic Age (Carman, 1946). The Silurian System includes dolomite limestone of the Tymochtee and Bass Island Groups. These occur in the southeastern corner of the county, underlying practically all of Bartlow Township and the southeast corner of Richfield and Marion Townships (Stout et. al, 1943).

Dolomite, limestone, and shale of the Devonian System underlie the rest of the county. The Antrim or Ohio shale, which provides a very poor water supply for wells, occurs in the northwestern part of the county. It lies north of a northeast-southwest line that extends between Florida and Colton.

The only known exposures of bedrock in the county are in the Maumee River bed and at two or three abandoned quarries along the Maumee River banks or near the mouth of its tributaries.

Farming

The Statistics in this section were obtained from the Ohio Agricultural Statistics Service website: http://www.nass.usda.gov/oh/.

This subsection discusses land use and gives data on farms and the acreage used for principal crops in the county. The statistics are from the U.S. Census of Agriculture.

In 2003, Henry County had 241,000 acres in farms. Of this acreage, 209,380 acres were cropland. There were 1,695 farms in the county in 1969 and as of 2003 there were 840 farms. The decline in the number of farms can be attributed to the trend of combining smaller farms into much larger farms. The average farm in the county has increased in size from about 157 acres in 1969 to 287 acres in 2003.

The acreage of principal crops has varied based on individual crop economics. Tomato acreage has dropped due to the loss of all fresh processing facilities located in the county. Crop acreage in the county in 2003 were as follows: 66,900 acres in corn, 93,700 acres in soybeans, 36,200 acres in wheat, 7,700 acres in hay, and 880 acres in processing tomatoes. Other vegetables for processing totaled 3000 acres.

In 2003 Henry County had one of the fewest number of cattle for Ohio counties at 4,500. Henry County has an average number of hogs and pigs for Ohio counties at 8,200.

Industry

Henry County is the home to one of the largest food processing plants in the United States The county also is the home to other types of industries including: automotive parts manufacturing, food container manufacturing, assembly control equipment, plastic product manufacturing, asphalt paving, and several food storage and warehousing facilities. Agriculture is a driving economical force in Henry County. Agricultural producers, and the service providers needed to keep them thriving, abound in the county.

Transportation

Early transportation was provided by the Miami-Erie Canal, which was completed in 1843. It was operated and profitable until the turn of the century, which coincided with the addition of railroads to the county. Most of the railroads were built between 1850 and 1900. Several of the railroads are still active today.

Two federal highways are major traffic arteries across the county. These are U.S. Highways 6 and 24. Parts of these roads have been relocated and constructed as limited access roads during the period 1965 to 1967. Several state highways provide good traffic links between the communities of the county.

Three pipelines traverse the area. Two of the lines cross the northwest corner of the county.

How This Survey Was Made

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

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

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

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

General Soil Map Units

The general soil map (last page of the publication) shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, it consists of one or more major soils or miscellaneous areas and some minor soils or miscellaneous areas. It is named for the major soils or miscellaneous areas. The components of one map unit 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 map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

Some soil boundaries and soil names in this survey area do not fully match those in adjacent survey areas that were published at an earlier date. Differences are the result of changes and refinements in soil series concepts, updated soil taxonomy, slightly different map unit composition in survey areas, and the use of the State Soil Geographic data (STATSGO) map as the base for the general soil map in this publication.

General Soil Map

The general soil map at the back of this survey shows, in color, the soil associations in Henry County. A soil association is a landscape that has a distinctive proportional pattern of soils. It normally consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in one association may occur in another, but in a different pattern.

A map showing soil associations is useful to people who want a general idea of the soils in a county, who want to compare different parts of a county, or who want to know the location of large tracts that are suitable for a certain kind of land use. Such a map is a useful general guide in managing a watershed, a wooded tract, or a wildlife area, or in planning engineering works, recreational facilities, and community developments. It is not a suitable map for planning the management of a farm or field, or for selecting the exact location of a road, building, or similar structure, because the soils in any one association ordinarily differ in slope, depth, drainage, and other characteristics that affect their management.

The terms for texture used in the title for several of the associations apply to the texture of the surface layer. For example, in the title of association 1, the words, "clayey soils" refer to the texture of the surface layer.

The soil associations in Henry County are discussed in the following pages.

1. Hoytville association

Very poorly drained, nearly level, dominantly clayey soils formed in wave-modified glacial till

This association is on a nearly level glacial till plain that is broken at wide intervals by tributary streams of the Maumee River. The till plain has been beveled and reworked by lake water during the postglacial period. This association occupies about 35 percent of the county and is the largest.

About 90 percent of the association is Hoytville soils, and the remaining 10 percent is Nappanee, Haskins, Mermill, and other soils.

The Hoytville soils are dark colored and very poorly drained. They are nearly level, have a seasonal high water table, and are subject to ponding in low areas. They have a clayey subsoil and, in most places, a clayey surface layer. The somewhat poorly drained Nappanee and Haskins soils are lighter colored than the Hoytville and the very poorly drained Mermill soils. The Nappanee soils generally are on slope breaks along streams, but they also are in small isolated areas surrounded by dark-colored Hoytville soils. They have a clayey subsoil and a seasonal high water table.

This association was part of the Black Swamp that the early settlers saw in the northwestern part of what is now Ohio. Today, however, surface and tile drains remove excess water to numerous, deep, roadside ditches and streams. The soils still are naturally wet in winter and spring, but artificial drainage has helped to lower the seasonal high water table. Maintenance of artificial drainage systems is the major management need in this association. The hazard of erosion is little or none, and most of the association is used for cultivated crops. A few undrained areas remain in trees.

The Hoytville soils are important to farming and are intensively used for corn, soybeans, wheat, tomatoes, and sugar beets. They have a deep rooting zone when the water table is low in summer, and they have a high available water capacity.

The seasonal high water table and slow permeability of the soils in this association are limitations to many nonfarm uses, including septic tank filter fields. The basements of homes are commonly wet unless the foundations are adequately drained.

2. Hoytville-Nappanee association

Very poorly drained and somewhat poorly drained, nearly level to gently sloping, dominantly clayey soils formed in wave-modified glacial till

This association consists of dark-colored Hoytville soils and lighter colored Nappanee soils. These soils are nearly level and occupy a glacial till plain that has been beveled and reworked by lake water in the postglacial period. Much of the association is dissected by small tributaries of the Maumee River. The extreme northwestern and southwestern areas of this association are less highly dissected than other areas. This association occupies about 27 percent of the county.

About 70 percent of the association is Hoytville soils, 10 percent is Nappanee soils, and the remaining 20 percent is Mermill, Haskins, Rimer, and other soils.

The Hoytville soils are dark colored and very poorly drained. The Nappanee soils are somewhat poorly drained and lighter colored than the Hoytville soils. A large acreage of Nappanee soils is on slope breaks along streams. The Hoytville and Nappanee soils formed in wave-worked glacial till and have a clayey subsoil and a seasonal high water table. The Mermill soils are very poorly drained, and the Haskins and Rimer soils are somewhat poorly drained.

The dominant soils in this association are saturated with excess water in winter and spring, but extensive drainage throughout the association helps to remove much excess water. Numerous, deep, roadside ditches provide outlets for many tile and surface drains. Maintenance of artificial drainage is the major management need for the soils in this association. Erosion is a hazard on gently sloping Nappanee soils along streams.

Most of the soils in this association are used for cash crops. The Hoytville soils are important to farming and are used intensively for corn, soybeans, and wheat, and for sugar beets, tomatoes, and other specialty crops. The Nappanee soils are not as well suited to crops as the Hoytville soils but are widely used for corn, soybeans, and wheat.

Limitations for many nonfarm uses, including septic tank filter fields, are a seasonally high water table and slow or very slow permeability. Houses on both Hoytville and Nappanee soils commonly have wet basements unless the foundations are properly drained.

3. Millgrove-Mermill-Haskins association

Very poorly drained and somewhat poorly drained, nearly level, loamy soils formed mainly in water-worked material

This association is characterized by moderate to large expanses of nearly level, dark-colored soils and small to moderate areas of lighter colored soils on low rises. The association mainly occurs in a fairly broad area south of, and roughly parallel to, the Maumee River. This association occupies about 16 percent of the county.

About 30 percent of the association is Millgrove soils, about 25 percent is Mermill soils, about 11 percent is Haskins soils, and the remaining 34 percent is Digby, Rimer, Seward, and other soils in areas along the Maumee River that are subject to flooding.

The Millgrove and Mermill soils are dark colored and very poorly drained. The Millgrove soils formed in thick loamy material underlain by sand and gravel, but the Mermill soils formed in moderately deep loamy material and underlying clay. The somewhat poorly drained Haskins soils formed in material similar to that in which Mermill soils formed, but they are lighter colored than both the Mermill and Millgrove soils. The Digby and Rimer soils are somewhat poorly drained, and the Seward soils are moderately well drained.

The dominant soils in this association have a seasonally high water table in winter and spring. They can, however, be easily drained with surface drains and tile installations. Maintenance of artificial drainage systems is the major management need in this association. There is little or no hazard of erosion.

Most of the acreage in this association is used mainly for such cash crops as corn, soybeans, and wheat. Tomatoes are grown to some extent, but growers have had problems with fruit color and disease. If these soils are adequately drained, they are suited to many kinds of truck crops. They are well suited to irrigation.

The seasonally high water table in the dominant soils is a limitation to many nonfarm uses, including septic tank filter fields. Houses on Millgrove, Mermill, and Haskins soils are likely to have wet basements unless the foundations are properly drained.

4. Granby-Ottokee-Tedrow association

Very poorly drained, moderately well drained, and somewhat poorly drained, nearly level to gently sloping, sandy soils formed in lacustrine and windblown material

This association is characterized by highly contrasting areas of nearly level, dark-colored, sandy soils and gently sloping, lighter colored, sandy soils. The most extensive area of this association is in the northeastern part of the county:' It is part of a large area in Northwestern Ohio known locally as the Oak Openings. This association occupies about 8 percent of the county.

About 29 percent of the association is Granby soils, about 24 percent is Ottokee soils, about 12 percent is Tedrow soils, and the remaining 35 percent is Oakville, Spinks, Arkport, Galen, Adrian, and other soils.

The nearly level Granby soils are dark colored and very poorly drained. The gently sloping Ottokee soils are lighter colored and moderately well drained. The somewhat poorly drained Tedrow soils generally are in areas between the Granby and Ottokee soils. Granby and Tedrow soils have a seasonally high water table; Ottokee soils have a seasonally high water table for only short periods. Granby and Tedrow soils are commonly too wet in spring and too dry in summer for optimum plant growth. Oakville, Spinks, Arkport, and Ottokee are some of the more droughty soils in the county. Adrian soils are poorly drained, organic soils.

Seasonal wetness is the dominant limitation on the nearly level soils, and soil blowing and droughtiness are hazards on the gently sloping soils on knolls. The Granby and Tedrow soils can be artificially drained. The Granby soils tend to flow and plug the tile lines when they are saturated. Because Granby soils are in low areas, they commonly lack outlets, and drain pumps are used in places.

The soils in this association are mainly used for such cash crops as corn, soybeans, and wheat. A large acreage of woodland is in the Maumee State Forest. Areas of woodland other than those in the state forest, are being cleared and converted to cropland. Large plantings of white pine and other evergreens have been planted on the droughty soils in the Maumee State Forest. Trees grow well on Ottokee soils, and these soils are suited to Christmas tree production. Such special crops as cabbage, carrots, strawberries, cucumbers, peppers, and asparagus are grown on Ottokee soils. The major soils in this association are suitable for irrigation.

The dominant soils in this association differ in limitations for nonfarm uses. Granby and Tedrow soils have a seasonally high water table, and Ottokee soils are sandy and droughty. Houses on Granby and Tedrow soils are likely to have wet basements unless the foundations are properly drained.

5. Toledo-Fulton-Lenawee association

Very poorly drained and somewhat poorly drained, nearly level to gently sloping soils formed in lacustrine sediment

This association occupies nearly flat landscapes that have largely been cleared of trees. It mainly occurs in scattered areas that roughly parallel the Maumee River. One area is in the northwestern corner of the county. This association occupies about 7 percent of the county.

About 38 percent of the association is Toledo soils, about 15 percent is Lenawee soils, about 26 percent is Fulton soils, and the remaining 21 percent is Del Rey, Shinrock, Lucas, and other soils.

The nearly level Toledo and Lenawee are dark colored and very poorly drained. The Fulton soils are lighter colored and slightly more sloping than the Toledo and Lenawee soils, and they are somewhat poorly drained. The Toledo and Fulton soils formed in material relatively high in content of clay. Lenawee soils formed in lacustrine material that has a higher content of sand than the material in which the Toledo and Fulton soils formed. The soils in this association have a seasonally high water table.

Seasonal wetness is the dominant limitation of the soils in this association, but extensive artificial drainage has greatly reduced this limitation. Numerous deep, roadside ditches provide outlets for tile and surface drains. Maintenance of these artificial drainage systems is the major management need in the association. There is little or no hazard of erosion, and most of the acreage is used mainly for cash crops.

The Toledo and Lenawee soils are well suited to corn, soybeans, and wheat. Sugar beets and tomatoes are grown on a small acreage of

Lenawee soils and to a lesser extent on Toledo soils. The Fulton soils are moderately well suited to field crops but are poorly suited to sugar beets and tomatoes.

Seasonal wetness and moderately slow to slow permeability are the dominant limitations to many nonfarm uses, including septic tank filter fields. Houses on Toledo or Lenawee soils are likely to have wet basements unless the foundations are properly drained.

6. Colwood-Kibbie association

Very poorly drained and somewhat poorly drained, nearly level soils formed in deltaic silt and fine sand

This association is entirely in Liberty Township. It occupies about 3 percent of the county.

About 30 percent of the association is Colwood soils, about 15 percent is Kibbie soils, and the remaining 55 percent is Millgrove, Mermill, Tuscola, Lenawee, Tedrow, and Ottokee soils.

The dark colored, very poorly drained Colwood soils are in broad, flat areas. The lighter colored, somewhat poorly drained Kibbie soils are in small, slightly higher areas. Most of the other soils in this association are either sandy soils or loamy soils.

The dominant soils and many of the other soils in this association are waterlogged during wet periods, but surface and tile drain effectively help to remove the excess water. Natural drainageways generally provide adequate outlets for drains. Unless the soils are adequately drained, trafficability is difficult during wet weather.

The Colwood soils are well suited to crops and are important soils to farming in the county. The Kibbie soils also are well suited to crops. The soils in this association are used mainly for such cash crops as corn, soybeans, and wheat. Some sugar beets and tomatoes are grown, but the acreage is small. A larger acreage than presently used is suited to specialty crops, including some kinds of truck crops. The dominant soils are suitable for irrigation.

Seasonal wetness is the major limitation to many non-farm uses, including septic tank filter fields and building sites. Houses on Colwood, Millgrove, Mermill, and Lenawee soils are likely to have wet basements unless the foundations are properly drained. The Tuscola and Ottokee soils have fewer limitations for building sites than the other soils in this association.

7. Latty association

Very poorly drained, nearly level, clayey soils formed in lacustrine sediment

This association occupies two areas in the county. The large area is in Ridgeville Township, and the smaller area is in the southwestern part of Pleasant Township. Both areas are broad, flat, and relatively treeless. This association occupies about 1 percent of the county.

About 70 percent of the association is Latty soils, and the remaining 30 percent is Nappanee, Haskins, Rawson, Seward, and other soils. The soils of minor extent are mostly in the Ridgeville Township area of this association.

The major limitation is a seasonally high water table during wet periods. The seasonally high water table is lowered moderately well by using tile drains. Numerous, deep, roadside ditches provide outlets for tile and surface drains. The Rawson and Seward soils are better drained than the other soils in this association.

Most of the soils in this association are used for cash crops, mainly corn, wheat, and soybeans. Sugar beets and tomatoes are grown on a limited acreage. The Latty soils are well suited to crops but are clayey and have poor tilth and poor drainage. These limitations restrict their use for specialty crops.

Very slow permeability and very poor natural drainage are dominant limitations to many nonfarm uses, including septic tank filter fields and building sites. Houses on Latty soils are likely to have wet basements unless the foundations are properly drained. The Rawson and Seward soils have fewer limitations for building sites than the other soils in this association.

8. Oshtemo-Haskins-Haney association

Well drained, somewhat poorly drained, and moderately well drained, nearly level to sloping, loamy soils in loamy material over sand, gravel, clay, or glacial till

This association occupies long, low beach ridges that mark the shorelines of postglacial lakes. These ridges are prominent on the landscape. They are in the southwestern and northwestern parts of the county. This association occupies less than 1 percent of the county.

About 26 percent of the association is Oshtemo soils, 26 percent is Haskins soils, 20 percent is Haney soils, and the remaining 28 percent is Rawson, Digby, Rimer, Seward, Vaughnsville, Mermill, Nappanee, Millgrove, and other soils.

The gently sloping, well drained Oshtemo soils and the gently sloping, moderately well drained Haney soils formed in deep, loamy soil material that has a moderate to high content of sand. The nearly level, somewhat poorly drained Haskins soils formed in loamy material that is underlain by clay.

A seasonally high water table is not a limitation in the Oshtemo and Haney soils, but it is a limitation in the Haskins soils and some of the other soils. Artificial drainage helps to reduce the wetness in these soils.

Wheat is the principal crop grown throughout this association. Corn and soybeans are also grown but to a lesser extent. This is especially true on Oshtemo soils, because they have a low available moisture capacity. Alfalfa and clover are commonly grown for hay. Apple, peach, and vine crops are adapted to the better drained Oshtemo and Haney soils. These soils are well suited to irrigation.

The Oshtemo and Haney soils of this association have fewer limitations for residential building sites than most other soils in the county, and their use for this purpose is increasing. The ridge topography of this association is commonly used for roadways. The seasonally high water table in the Haskins soils is a limitation for building sites and septic tank filter fields.

9. Sloan-Ross-Shoals association

Very poorly drained, well-drained, and somewhat poorly drained, nearly level, loamy soils formed in alluvium

This association occupies long areas that range from one-eighth to one-fourth mile in width. The areas are on the flood plains of the Maumee River. This association occupies about 1 percent of the county.

About 35 percent of the association is Sloan soils, about 18 percent is Ross soils, about 18 percent is Shoals soils, and the remaining 29 percent is Medway, Genesee, Wabasha, and other soils.

The Sloan soils are dark colored and very poorly drained. The Ross soils are dark colored and well drained. The lighter colored Shoals soils are somewhat poorly drained. These dominant soils formed in loamy sediment washed from uplands. They are subject to periodic flooding and sediment deposition.

The Sloan and Shoals soils are generally waterlogged in winter and spring because the water table is high. Excess water can be readily removed by tile and surface drains, but providing outlets for the drains is almost impossible in some places. The Ross soils do not need artificial drainage. Flooding occurs in winter and spring, especially on the Sloan and Shoals soils. It occurs less commonly on the Ross soils, because they generally are in the highest areas on the flood plains.

The major soils in this association are important soils to farming. They are mainly used for cash crops. Corn and soybeans are the major crops. Winter small grains are infrequently grown on Shoals and Sloan soils, because they are subject to flooding and seasonal wetness. Small grains are more commonly grown on the well drained Ross soils. The better drained Ross and Medway soils are well suited to specialty and truck crops. Tomatoes and sweet corn can be grown. The soils in this association, except the Wabasha soils, are suitable for irrigation.

Flooding is a severe limitation to most nonfarm uses, including building sites and septic tank filter fields.

10. Paulding association

Very poorly drained, nearly level soils formed in clayey lacustrine sediment

This association is in two small areas in the county. The larger area is in the southwestern part of Ridgeville Township, and the smaller area is in the southwestern part of Pleasant Township. The areas are nearly flat.

This association occupies less than 1 percent of the county.

About 86 percent of the association is Paulding soils, and the remaining 14 percent is Roselms, Fulton, Nappanee, and other soils.

The Paulding soils formed in lacustrine material that has a very high content of clay. The Roselms, Fulton, and Nappanee soils are in only the Ridgeville Township area.

The Paulding soils are very wet and are ponded in places during winter and spring. Removal of excess water generally is accomplished by surface drainage. Tile drains remove the water very slowly and generally are ineffective.

The soils in this association are used mostly for cash crops, mainly wheat and soybeans. A small acreage of corn is grown. Under good management, the acreage of Paulding soils in corn can be increased.

Very poor natural drainage and a very high content of clay are limitations of the Paulding and Roselms soils for most nonfarm uses, including septic tank filter fields. Houses on

Paulding soils are likely to have wet basements unless the foundations are properly drained.

Detailed Soil Map Units

The map units delineated on the detailed soil maps in this survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses.

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

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

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

The detailed map unit descriptions list management statements for most major uses of the soils: cropland, pasture, woodland, building sites, septic tank absorption fields, and local roads and streets. The management statements listed for a particular map unit address the most limiting features of that soil for a certain use. Some management statements suggest specific measures that may help alleviate the effects of these limiting soil features. The mention of such management measures is not a recommendation, especially where current laws or programs may prohibit an activity, such as installation of drainage. Even the best management practices cannot overcome some limitations of the soil.

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

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

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, *Hoytville silty clay loam, 0 to 1 percent slopes* is a phase of the Hoytville series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. *Mermill–Aurand silt loams, 0 to 1 percent slopes* is an example.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. *Gravel pits* is an example.

Table 4 (p. 282) gives the acreage and proportionate extent of each map unit. Other tables give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils or miscellaneous areas.

Ad-Adrian muck

Setting
Landform: Swamps

Map Unit Composition
Adrian and similar components: 90 percent

Similar Components
Drained areas where muck is as thin as 13 inches

Contrasting Components
Tedrow soils: 4 percent
Granby soils: 3 percent
Warners soils: 3 percent

Map Unit Interpretive Groups
Land capability classification: 4w
Prime farmland: Not prime farmland

Soil Properties and Qualities

ADRIAN
Available water capacity: About 6.1 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 125 to 200 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 50 inches
Depth to the top of the seasonal high water table: 0.0 to 1.0 feet
Water table kind: Apparent
Ponding: Long
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 55.0 to 75.0 percent
Parent material: Organic material over outwash
Permeability: Moderately rapid
Potential frost action: High
Shrink-swell potential: Low
Surface layer texture: Muck
Potential for surface runoff: Negligible
Wind erosion hazard: Severe

Use and Management Considerations

Cropland

- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- A combination of surface and subsurface drainage helps to remove excess water.
- Subsidence or shrinkage of the muck causes displacement of subsurface drains.
- Control of the water table helps reduce subsidence, prevent burning, and reduce the hazard of wind erosion.
- The effectiveness of subsurface drains may be reduced because the drains can become filled with sand.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low pH in the soil may cause a nutrient imbalance in seedlings.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.

- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Ponding restricts the safe use of roads by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building Sites

- When drained, the organic layers in this soil subside. Subsidence leads to differential rates of settlement which may cause foundations to break. Because of the high potential for subsidence, this soil is generally unsuited to building site development.
- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Subsidence of the organic material reduces the bearing capacity of this soil.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Component Interpretive Groups

ADRIAN
Pasture and hayland suitability group: D-1
Hydric soil: Yes

ArB-Arkport fine sand, 2 to 6 percent slopes

Setting
Landform: Dunes and ridges on lake plain
Position on the landform: Backslopes, shoulders and summits

Map Unit Composition
Arkport and similar components: 100 percent

Similar Components
Oakville soils
Galen soils
Ottokee soils

Map Unit Interpretive Groups
Land capability classification: 2e
Prime farmland: All areas are prime farmland

Soil Properties and Qualities

ARKPORT
Available water capacity: About 5.2 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 8.0 to 20 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 75 inches
Depth to the top of the seasonal high water table: Greater than 6 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Glaciofluvial deposits
Permeability: Moderately rapid
Potential frost action: Low
Shrink-swell potential: Low
Surface layer texture: Fine sand
Potential for surface runoff: Very low
Wind erosion hazard: Severe

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.

- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- The limited available water capacity inhibits root development and increases the seedling mortality rate.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- This soil is well suited to use as building sites.

Septic Tank Absorption Fields

- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.

Local Roads and Streets

- This soil is well suited to use as a site for local roads and streets.

Component Interpretive Groups

ARKPORT
Pasture and hayland suitability group: B-1
Hydric soil: No

ArC-Arkport fine sand, 6 to 12 percent slopes

Setting
Landform: Ridges and dunes on lake plains
Position on the landform: Shoulders and backslopes

Map Unit Composition
Arkport and similar components: 100 percent

Similar Components
Slopes of more than 12 percent
Gently sloping areas
Oakville soils

Map Unit Interpretive Groups
Land capability classification: 3e
Prime farmland: Not prime farmland

Soil Properties and Qualities

ARKPORT
Available water capacity: About 6.1 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 8.0 to 20 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 79 inches
Depth to the top of the seasonal high water table: Greater than 6 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Glaciofluvial deposits
Permeability: Moderately rapid
Potential frost action: Low
Shrink-swell potential: Low
Surface layer texture: Fine sand
Potential for surface runoff: Low
Wind erosion hazard: Severe

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland

- Erosion control is needed when pastures are renovated.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- The slope may restrict the use of some mechanical planting equipment.
- Burning may destroy organic matter.

Building Sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.

Local Roads and Streets

- Because of the slope, designing local roads and streets is difficult.

Component Interpretive Groups

ARKPORT
Pasture and hayland suitability group: A-1
Hydric soil: No

AsA-Aurand fine sandy loam, 0 to 2 percent slopes

Setting
Landform: Flats and rises on lake plains
Position on the landform: Summits and footslopes

Map Unit Composition
Aurand and similar components: 90 percent

Similar Components
Lighter colored surface layer
Till between 40 and 60 inches
Moderately well drained soils
Surface layer less than 10 inches thick
More clay in the subsoil
Sandy loam, loam, or clay loam surface texture
Carbonates between 15 and 25 inches
Stratified substratum between 40 and 60 inches

Contrasting Components
Mermill soils: 7 percent
Alvada soils: 3 percent

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

AURAND
Available water capacity: About 7.0 inches to a depth of 59 inches
Cation-exchange capacity of the surface layer: 8.0 to 23 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 40 to 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.5 feet
Water table kind: Perched

Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 6.0 percent
Parent material: Loamy glaciolacustrine deposits over basal till
Permeability: Very slow or slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Fine sandy loam
Potential for surface runoff: Low
Wind erosion hazard: Moderate

Use and Management Considerations

Cropland

- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- The root system of winter grain crops may be damaged by frost action.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Soil wetness may limit the use of this soil by log trucks.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- In some areas the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- Special design of roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

AURAND
Pasture and hayland suitability group: C-1
Hydric soil: No

AtA-Aurand loam, 0 to 2 percent slopes

Setting
Landform: Beach ridges, flats, and rises on lake plains
Position on the landform: Summits and footslopes

Map Unit Composition
Aurand and similar components: 91 percent

Similar Components
Lighter colored surface layer
Till at 40 to 60 inches
Moderately well drained soils

Dark colored surface layer less than 10 inches thick
More clay and less sand in the subsoil

Contrasting Components
Mermill soils: 6 percent
Alvada soils: 3 percent

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

AURAND
Available water capacity: About 6.4 inches to a depth of 48 inches
Cation-exchange capacity of the surface layer: 8.8 to 28 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 40 to 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 6.0 percent
Parent material: Loamy glaciolacustrine deposits over basal till
Permeability: Very slow or slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- Special design of roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

AURAND
Pasture and hayland suitability group: C-1
Hydric soil: No

BcA-Bixler loamy fine sand, 0 to 3 percent slopes

Setting
Landform: Low ridges and knolls on outwash plains, beach ridges, and deltas
Position on the landform: Shoulders and summits

Map Unit Composition
Bixler and similar components: 96 percent

Similar Components
Tedrow soils

Contrasting Components
Ottokee soils: 4 percent

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: All areas are prime farmland

Soil Properties and Qualities

BIXLER
Available water capacity: About 7.1 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 3.0 to 15 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 2.0 to 3.5 feet
Water table kind: Apparent
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 3.0 percent
Parent material: Sandy lacustrine deposits over stratified lacustrine deposits
Permeability: Rapid over moderate
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Loamy fine sand
Potential for surface runoff: Very low
Wind erosion hazard: Severe

Use and Management Considerations

Cropland

- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.

- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Component Interpretive Groups

BIXLER
Pasture and hayland suitability group: C-1
Hydric soil: No

Ca-Clay pits

Setting
Landform: None assigned

Map Unit Composition
Clay pits and similar components: 100 percent

Map Unit Interpretive Groups
Land capability classification: None assigned
Prime farmland: Not prime farmland

Use and Management Considerations

- Onsite investigation is needed to determine the suitability for specific uses.

Component Interpretive Groups

CLAY PITS
Pasture and hayland suitability group: Not rated
Hydric soil: Unranked

Ch-Cohoctah fine sandy loam

Setting
Landform: Flood plains

Map Unit Composition
Cohoctah and similar components: 100 percent

Similar Components
More sand and is very droughty

Map Unit Interpretive Groups
Land capability classification: 3w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

COHOCTAH
Available water capacity: About 4.9 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 10 to 30 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 71 inches
Depth to the top of the seasonal high water table: 0.0 to 0.5 feet
Water table kind: Apparent
Ponding: None
Drainage class: Very poorly drained
Flooding: Occasional
Organic matter content in the surface layer: 3.0 to 15.0 percent
Parent material: Alluvium
Permeability: Moderately rapid
Potential frost action: High
Shrink-swell potential: Low
Surface layer texture: Fine sandy loam
Potential for surface runoff: Very low
Wind erosion hazard: Moderate

Use and Management Considerations

Cropland

- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Plants may suffer from moisture stress because of the limited available water capacity.
- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Measures that protect the soil from scouring and minimize the loss of crop residue by floodwaters are needed.
- Small grain crops may be damaged by flooding in winter and spring.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- Forage production can be improved by seeding grass-legume mixtures that are tolerant of flooding.
- Sediment left on forage plants after a flood event may reduce palatability and forage intake by the grazing animal.
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Flooding may result in damage to haul roads and increased maintenance costs.
- Soil wetness may limit the use of this soil by log trucks.
- Flooding restricts the safe use of roads by log trucks.

Building Sites

- Under normal weather conditions, this soil is subject to occasional flooding. The flooding may result in physical damage and costly repairs to buildings. This soil is generally unsuited to homesites. Special design of some structures, such as farm outbuildings, may be needed to prevent damage caused by flooding.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- This soil is generally unsuited to septic tank absorption fields. The flooding in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Rapidly moving floodwaters may damage some components of septic systems.
- Because of the seasonal high water table, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- Special design of roads and bridges is needed to prevent the damage caused by flooding.

Component Interpretive Groups

COHOCTAH
Pasture and hayland suitability group: B-3
Hydric soil: Yes

Ck-Colwood fine sandy loam, 0 to 1 percent slopes

Setting
Landform: Flats drainageways, depressions, and deltas on lake plains

Map Unit Composition
Colwood and similar components: 90 percent

Similar Components
Loamy fine sand or loam surface layer
Mermill soils
Less clay in the subsoil
Surface layer more than 10 inches thick
Till at 40 to 60 inches
More clay in the subsoil

Contrasting Components
Kibbie: 5 percent
Wauseon soils: 5 percent

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

COLWOOD
Available water capacity: About 10.7 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 6.8 to 27 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 0.0 to 1.0 feet
Water table kind: Apparent
Ponding: Long
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 8.0 percent
Parent material: Loamy glaciolacustrine deposits
Permeability: Moderately slow or moderate
Potential frost action: High
Shrink-swell potential: Low
Surface layer texture: Fine sandy loam
Potential for surface runoff: Negligible
Wind erosion hazard: Moderate

Use and Management Considerations

Cropland

- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- A combination of surface and subsurface drainage helps to remove excess water.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Soil wetness may limit the use of this soil by log trucks.
- Ponding restricts the safe use of roads by log trucks.

Building Sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Special design of roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

COLWOOD
Pasture and hayland suitability group: C-1
Hydric soil: Yes

Cm-Colwood loam, 0 to 1 percent slopes

Setting
Landform: Flats, depressions, drainageways, and deltas on lake plains

Map Unit Composition
Colwood and similar components: 90 percent

Similar Components
Fine sandy loam surface layer
Less clay in the subsoil
Mermill soils
Surface layer more than 10 inches thick

Contrasting Components
Kibbie soils: 5 percent
Wauseon soils: 5 percent

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

COLWOOD
Available water capacity: About 11.0 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 8.8 to 32 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 0.0 to 1.0 feet
Water table kind: Apparent
Ponding: Long
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 8.0 percent
Parent material: Loamy glaciolacustrine deposits
Permeability: Moderately slow or moderate
Potential frost action: High
Shrink-swell potential: Low
Surface layer texture: Loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- A combination of surface and subsurface drainage helps to remove excess water.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Ponding restricts the safe use of roads by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building Sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Special design of roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

COLWOOD
Pasture and hayland suitability group: C-1
Hydric soil: Yes

Cn-Colwood loam

Setting
Landform: Flats on lake plains

Map Unit Composition
Colwood and similar components: 95 percent

Similar Components
Thinner surface layer
Fine sandy loam surface layer

Contrasting Components
Kibbie: 3 percent
Rimer soils: 2 percent

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

COLWOOD
Available water capacity: About 10.0 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 10 to 25 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 65 inches
Depth to the top of the seasonal high water table: 0.0 to 0.5 feet
Water table kind: Apparent
Ponding: Long
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 8.0 percent
Parent material: Glaciolacustrine deposits over outwash
Permeability: Slow or moderately slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- A combination of surface and subsurface drainage helps to remove excess water.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Ponding restricts the safe use of roads by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building Sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

COLWOOD
Pasture and hayland suitability group: C-1
Hydric soil: Yes

Co-Colwood silt loam

Setting
Landform: Flats on lake plains

Map Unit Composition
Colwood and similar components: 95 percent

Similar Components
Thinner surface layer

Contrasting Components
Kibbie soils: 3 percent
Del Rey soils: 2 percent

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

COLWOOD
Available water capacity: About 10.0 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 10 to 25 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 65 inches
Depth to the top of the seasonal high water table: 0.0 to 0.5 feet
Water table kind: Apparent
Ponding: Long
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 8.0 percent
Parent material: Glaciolacustrine deposits over outwash
Permeability: Moderately slow or moderate
Potential frost action: High
Shrink-swell potential: Low
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Controlling traffic can minimize soil compaction.
- A combination of surface and subsurface drainage helps to remove excess water.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Ponding restricts the safe use of roads by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building Sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Special design of roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

COLWOOD
Pasture and hayland suitability group: C-1
Hydric soil: Yes

Cu-Cut and fill land

Setting
Landform: None assigned

Map Unit Composition
Cut and fill land and similar components: 100 percent

Map Unit Interpretive Groups
Land capability classification: None assigned
Prime farmland: Not prime farmland

Use and Management Considerations

- Onsite investigation is needed to determine the suitability for specific uses.

Component Interpretive Groups

CUT AND FILL LAND
Pasture and hayland suitability group: Not rated
Hydric soil: Unranked

DeA-Del Rey loam, 0 to 2 percent slopes

Setting
Landform: Lake plains
Position on the landform: Shoulders and summits

Map Unit Composition
Del Rey and similar components: 100 percent

Similar Components
Gently sloping areas
Fulton soils

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

DEL REY
Available water capacity: About 9.1 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 12 to 20 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 52 inches
Depth to the top of the seasonal high water table: 0.5 to 1.5 feet
Water table kind: Apparent
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 3.0 percent
Parent material: Lacustrine deposits
Permeability: Slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- The rooting depth of crops may be restricted by the high clay content.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

DEL REY
Pasture and hayland suitability group: C-1
Hydric soil: No

DfA-Del Rey silt loam, 0 to 2 percent slopes

Setting
Landform: Lake plains
Position on the landform: Summits and shoulders

Map Unit Composition
Del Rey and similar components: 100 percent

Similar Components
Gently sloping areas
Fulton soils
Silty clay loam surface layer

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

Del Rey
Available water capacity: About 9.1 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 12 to 20 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 52 inches
Depth to the top of the seasonal high water table: 0.5 to 1.5 feet
Water table kind: Apparent
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 3.0 percent
Parent material: Lacustrine deposits
Permeability: Slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the

soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

DEL REY
Pasture and hayland suitability group: C-1
Hydric soil: No

DuA-Digby fine sandy loam, 0 to 2 percent slopes

Setting
Landform: Stream terraces, outwash plains, and beach ridges
Position on the landform: Shoulders and summits

Map Unit Composition
Digby and similar components: 100 percent

Similar Components
Sandy loam surface layer
Slopes of more than 2 percent
Haskins soils

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

DIGBY
Available water capacity: About 6.0 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 5.0 to 15 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 50 inches
Depth to the top of the seasonal high water table: 0.5 to 1.5 feet
Water table kind: Apparent
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Glaciofluvial deposits over outwash
Permeability: Moderately slow or moderate
Potential frost action: High
Shrink-swell potential: Low
Surface layer texture: Fine sandy loam
Potential for surface runoff: Low
Wind erosion hazard: Moderate

Use and Management Considerations

Cropland

- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Soil wetness may limit the use of this soil by log trucks.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.

Component Interpretive Groups

DIGBY
Pasture and hayland suitability group: C-1
Hydric soil: No

DyA-Digby loam, 0 to 2 percent slopes

Setting
Landform: Stream terraces, outwash plains, and beach ridges
Position on the landform: Shoulders and summits

Map Unit Composition
Digby and similar components: 90 percent

Similar Components
Slopes of more than 2 percent
Haskins soils

Contrasting Components
Millgrove soils: 4 percent
Hoytville soils: 3 percent
Mermill soils: 3 percent

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

DIGBY
Available water capacity: About 6.6 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 5 to 20 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 50 inches
Depth to the top of the seasonal high water table: 0.5 to 1.5 feet

Water table kind: Apparent
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 4.0 percent
Parent material: Glaciofluvial deposits over outwash
Permeability: Moderately slow or moderate
Potential frost action: High
Shrink-swell potential: Low
Surface layer texture: Loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.

Component Interpretive Groups

DIGBY
Pasture and hayland suitability group: C-1
Hydric soil: No

DzA-Digby loam, 0 to 3 percent slopes

Setting
Landform: Low knolls and ridges on stream terraces and outwash plains
Position on the landform: Summits and shoulders

Map Unit Composition
Digby and similar components: 92 percent

Contrasting Components
Millgrove soils: 8 percent

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

DIGBY
Available water capacity: About 6.5 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 5 to 20 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 1.0 to 2.5 feet
Water table kind: Apparent
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 4.0 percent
Parent material: Loamy outwash over sandy and gravelly outwash
Permeability: Moderately slow or moderate
Potential frost action: High
Shrink-swell potential: Low
Surface layer texture: Loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.

Component Interpretive Groups

DIGBY
Pasture and hayland suitability group: C-1
Hydric soil: No

Ee-Eel loam, 0 to 2 percent slopes, frequently flooded

Setting
Landform: Natural levees, flats and rises on flood plains

Map Unit Composition
Eel and similar components: 100 percent

Similar Components
Fine sandy loam surface layer
Less clay in the subsoil
Bedrock between 48 and 60 inches
Well drained soils
Somewhat poorly drained soils
Slopes of 2 to 6 percent
Darker colored surface layer

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: Prime farmland if protected from flooding or not frequently flooded during the growing season

Soil Properties and Qualities

EEL
Available water capacity: About 12.1 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 9.2 to 22 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 1.5 to 2.0 feet
Water table kind: Apparent
Ponding: None
Drainage class: Moderately well drained
Flooding duration: Frequent
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loamy alluvium
Permeability: Moderately slow or moderate
Potential frost action: High
Shrink-swell potential: Low
Surface layer texture: Loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Winter grain crops are commonly not grown because of frequent flooding.
- Measures that protect the soil from scouring and minimize the loss of crop residue by floodwaters are needed.

Pastureland

- Forage production can be improved by seeding grass-legume mixtures that are tolerant of flooding.
- Sediment left on forage plants after a flood event may reduce palatability and forage intake by the grazing animal.
- The root systems of plants may be damaged by frost action.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Flooding may result in damage to haul roads and increased maintenance costs.
- Soil wetness may limit the use of this soil by log trucks.
- Flooding restricts the safe use of roads by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building Sites

- The frequent flooding in areas of this soil greatly increases the risk of damage associated with floodwaters. Because of the flooding, this soil is generally unsuited to building site development.

Septic Tank Absorption Fields

- This soil is generally unsuited to septic tank absorption fields. The flooding in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Rapidly moving floodwaters may damage some components of septic systems.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- Special design of roads and streets is needed to prevent the structural damage caused by low soil strength.
- Special design of roads and bridges is needed to prevent the damage caused by flooding.

Component Interpretive Groups

EEL
Pasture and hayland suitability group: A-5
Hydric soil: No

FsA-Fulton loam, 0 to 2 percent slopes

Setting

Landform: Lake plains
Position on the landform: Shoulders and summits

Map Unit Composition

Fulton and similar components: 95 percent

Similar Components

Silty clay loam surface layer

Contrasting Components

Toledo soils: 5 percent

Map Unit Interpretive Groups

Land capability classification: 3w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

FULTON
Available water capacity: About 7.7 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 14 to 24 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 3.0 percent
Parent material: Lacustrine deposits
Permeability: Slow
Potential frost action: Moderate
Shrink-swell potential: High
Surface layer texture: Loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops may be restricted by the high clay content.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.

- Soil wetness may limit the use of this soil by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

FULTON
Pasture and hayland suitability group: C-2
Hydric soil: No

FsB-Fulton loam, 2 to 6 percent slopes

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

Map Unit Composition
Fulton and similar components: 100 percent

Similar Components
Moderately eroded areas

Map Unit Interpretive Groups
Land capability classification: 3e
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

FULTON
Available water capacity: About 7.7 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 14 to 24 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 3.0 percent
Parent material: Lacustrine deposits
Permeability: Slow
Potential frost action: Moderate
Shrink-swell potential: High
Surface layer texture: Loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- The rooting depth of crops may be restricted by the high clay content.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Erosion control is needed when pastures are renovated.
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

FULTON
Pasture and hayland suitability group: C-2
Hydric soil: No

FuA-Fulton silty clay loam, 0 to 2 percent slopes

Setting

Landform: Lake plains
Position on the landform: Shoulders and summits

Map Unit Composition
Fulton and similar components: 95 percent

Similar Components
Loam surface layer
Silt loam surface layer

Contrasting Components
Toledo soils: 5 percent

Map Unit Interpretive Groups
Land capability classification: 3w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

FULTON
Available water capacity: About 7.7 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 22 to 34 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 3.0 percent
Parent material: Lacustrine deposits
Permeability: Slow
Potential frost action: Moderate
Shrink-swell potential: High
Surface layer texture: Silty clay loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

FULTON
Pasture and hayland suitability group: C-2
Hydric soil: No

FuB-Fulton silty clay loam, 2 to 6 percent slopes

Setting
Landform: Lake plains
Position on the landform: Backslopes, shoulders, and summits

Map Unit Composition
Fulton and similar components: 100 percent

Similar Components
Silt loam surface layer
Moderately eroded areas

Map Unit Interpretive Groups
Land capability classification: 3e
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

FULTON
Available water capacity: About 7.3 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 22 to 34 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 3.0 percent
Parent material: Lacustrine deposits
Permeability: Slow
Potential frost action: Moderate
Shrink-swell potential: High
Surface layer texture: Silty clay loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Erosion control is needed when pastures are renovated.
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

FULTON
Pasture and hayland suitability group: C-2
Hydric soil: No

FvA-Fulton loam, sandy subsoil variant, 0 to 2 percent slopes

Setting
Landform: Lake plains
Position on the landform: Shoulders and summits

Map Unit Composition
Fulton Variant and similar components: 95 percent

Similar Components
Gently sloping areas
Fulton silty clay loam
Fulton loam

Contrasting Components
Toledo soils: 5 percent

Map Unit Interpretive Groups
Land capability classification: 3w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

FULTON
Available water capacity: About 9.1 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 11 to 22 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 64 inches
Depth to the top of the seasonal high water table: 0.5 to 1.5 feet
Water table kind: Apparent
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 4.0 percent
Parent material: Lacustrine deposits
Permeability: Slow
Potential frost action: High
Shrink-swell potential: High
Surface layer texture: Loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- The rooting depth of crops may be restricted by the high clay content.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

FULTON
Pasture and hayland suitability group: C-2
Hydric soil: No

GaA-Galen fine sand, 0 to 2 percent slopes

Setting
Landform: Deltas and dunes
Position on the landform: Shoulders and summits

Map Unit Composition
Galen and similar components: 100 percent

Similar Components
Arkport soils
Ottokee soils

Map Unit Interpretive Groups
Land capability classification: 2s
Prime farmland: All areas are prime farmland

Soil Properties and Qualities

GALEN
Available water capacity: About 6.7 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 1 to 5 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 92 inches
Depth to the top of the seasonal high water table: 2.0 to 3.0 feet
Water table kind: Apparent
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 4.0 percent
Parent material: Glaciofluvial deposits
Permeability: Moderately rapid
Potential frost action: Moderate
Shrink-swell potential: Low
Surface layer texture: Fine sand
Potential for surface runoff: Low
Wind erosion hazard: Severe

Use and Management Considerations

Cropland

- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland

- This soil is well suited to pasture.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.

- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Component Interpretive Groups

GALEN
Pasture and hayland suitability group: A-1
Hydric soil: No

GaB-Galen fine sand, 2 to 6 percent slopes

Setting
Landform: Deltas and dunes
Position on the landform: Shoulders, summits, and backslopes

Map Unit Composition
Galen and similar components: 100 percent

Similar Components
Arkport soils
Ottokee soils

Map Unit Interpretive Groups
Land capability classification: 2e
Prime farmland: All areas are prime farmland

Soil Properties and Qualities

GALEN
Available water capacity: About 6.7 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 1 to 5 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 92 inches
Depth to the top of the seasonal high water table: 2.0 to 3.0 feet
Water table kind: Apparent
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 4.0 percent
Parent material: Glaciofluvial deposits
Permeability: Moderately rapid
Potential frost action: Moderate
Shrink-swell potential: Low
Surface layer texture: Fine sand
Potential for surface runoff: Low
Wind erosion hazard: Severe

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland

- Erosion control is needed when pastures are renovated.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Component Interpretive Groups

GALEN
Pasture and hayland suitability group: A-1
Hydric soil: No

GbB-Galen loamy fine sand, 1 to 6 percent slopes

Setting
Landform: Knolls and ridges on dunes and beach ridges
Position on the landform: Shoulders, summits, and backslopes

Map Unit Composition
Galen and similar components: 85 percent

Similar Components
Tedrow soils

Contrasting Components
Granby soils: 5 percent

Map Unit Interpretive Groups
Land capability classification: 2e
Prime farmland: All areas are prime farmland

Soil Properties and Qualities

GALEN
Available water capacity: About 6.5 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 2.0 to 10 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 68 inches
Depth to the top of the seasonal high water table: 1.5 to 2.0 feet
Water table kind: Apparent
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 4.0 percent
Parent material: Eolian deposits and/or glaciolacustrine deposits
Permeability: Moderately rapid
Potential frost action: Moderate
Shrink-swell potential: Low
Surface layer texture: Loamy fine sand
Potential for surface runoff: Very low
Wind erosion hazard: Severe

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland

- Erosion control is needed when pastures are renovated.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Soil wetness may limit the use of this soil by log trucks.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.

Component Interpretive Groups

GALEN
Pasture and hayland suitability group: A-1
Hydric soil: No

Gm-Genesee loam

Setting
Landform: Flood plains

Map Unit Composition
Genesee and similar components: 100 percent

Similar Components
Calcareous above 20 inches
Shoals soils
silt loam surface layer

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: All areas are prime farmland

Soil Properties and Qualities

GENESEE
Available water capacity: About 9.8 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 9.0 to 23 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 52 inches
Depth to the top of the seasonal high water table: Greater than 3.0 feet
Ponding: None
Drainage class: Well drained
Flooding: Occasional
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Alluvium
Permeability: Moderately slow or moderate
Potential frost action: Moderate
Shrink-swell potential: Low
Surface layer texture: Loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Measures that protect the soil from scouring and minimize the loss of crop residue by floodwaters are needed.
- Small grain crops may be damaged by flooding in winter and spring.

Pastureland

- Forage production can be improved by seeding grass-legume mixtures that are tolerant of flooding.
- Sediment left on forage plants after a flood event may reduce palatability and forage intake by the grazing animal.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Flooding may result in damage to haul roads and increased maintenance costs.
- Flooding restricts the safe use of roads by log trucks.

- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building Sites

- Under normal weather conditions, this soil is subject to occasional flooding. The flooding may result in physical damage and costly repairs to buildings. This soil is generally unsuited to homesites. Special design of some structures, such as farm outbuildings, may be needed to prevent damage caused by flooding.

Septic Tank Absorption Fields

- This soil is generally unsuited to septic tank absorption fields. The flooding in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Rapidly moving floodwaters may damage some components of septic systems.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Special design of roads and streets is needed to prevent the structural damage caused by low soil strength.
- Special design of roads and bridges is needed to prevent the damage caused by flooding.

Component Interpretive Groups

GENESEE
Pasture and hayland suitability group: A-5
Hydric soil: No

Go-Gilford fine sandy loam

Setting
Landform: Flats on lake plains

Map Unit Composition
Gilford and similar components: 95 percent

Similar Components
Shallower depth to carbonates
More clayey subsoil
Thicker surface layer and subsoil
Granby soils

Contrasting Components
Tedrow soils: 5 percent

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

GILFORD
Available water capacity: About 4.7 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 6.0 to 20 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 0.0 to 0.5 feet
Water table kind: Apparent
Ponding: Long
Depth of ponding: 0.0 to 0.5 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 4.0 percent
Parent material: Outwash
Permeability: Moderately rapid
Potential frost action: High
Shrink-swell potential: Low
Surface layer texture: Fine sandy loam
Potential for surface runoff: Very low
Wind erosion hazard: Moderate

Use and Management Considerations

Cropland

- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.

- A combination of surface and subsurface drainage helps to remove excess water.

Pastureland

- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Soil wetness may limit the use of this soil by log trucks.
- Ponding restricts the safe use of roads by log trucks.

Building Sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Component Interpretive Groups

GILFORD
Pasture and hayland suitability group: C-1
Hydric soil: Yes

Gr-Granby loamy fine sand

Setting
Landform: Flats on lake plains

Map Unit Composition
Granby and similar components: 95 percent

Similar Components
Gilford soils
Mucky surface layer

Contrasting Components
Tedrow soils: 5 percent

Map Unit Interpretive Groups
Land capability classification: 4w
Prime farmland: Not prime farmland

Soil Properties and Qualities

GRANBY
Available water capacity: About 3.2 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 5.0 to 20 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 63 inches
Depth to the top of the seasonal high water table: 0.0 to 1.0 feet
Water table kind: Apparent
Ponding: Long
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 4.0 to 6.0 percent
Parent material: Glaciolacustrine deposits over outwash

Permeability: Rapid
Potential frost action: Moderate
Shrink-swell potential: Low
Surface layer texture: Loamy fine sand
Potential for surface runoff: Negligible
Wind erosion hazard: Severe

Use and Management Considerations

Cropland

- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- A combination of surface and subsurface drainage helps to remove excess water.
- The effectiveness of subsurface drains may be reduced because the drains can become filled with sand.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland

- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Soil wetness may limit the use of this soil by log trucks.
- Ponding restricts the safe use of roads by log trucks.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Component Interpretive Groups

GRANBY
Pasture and hayland suitability group: C-1
Hydric soil: Yes

Gv-Gravel pits

Setting
Landform: None assigned

Map Unit Composition
Gravel pits and similar components: 100 percent

Map Unit Interpretive Groups
Land capability classification: None assigned
Prime farmland: Not prime farmland

Use and Management Considerations

- Onsite investigation is needed to determine the suitability for specific uses.

Component Interpretive Groups

GRAVEL PITS
Pasture and hayland suitability group: Not rated
Hydric soil: Unranked

HaA-Haney fine sandy loam, 0 to 2 percent slopes

Setting
Landform: Stream terraces, outwash plains, and beach ridges
Position on the landform: Summits and shoulders

Map Unit Composition
Haney and similar components: 90 percent

Similar Components
Surface layer and subsoil more than 40 inches thick
No grayish-brown mottles in the upper part of the subsoil
Darker colored surface layer
Sandy loam surface layer
Digby soils

Contrasting Components
Millgrove soils: 4 percent
Hoytville soils: 3 percent
Mermill soils: 3 percent

Map Unit Interpretive Groups
Land capability classification: 1
Prime farmland: All areas are prime farmland

Soil Properties and Qualities

HANEY
Available water capacity: About 7.3 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 5.0 to 15 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 1.5 to 2.0 feet
Water table kind: Apparent
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Beach sand over outwash
Permeability: Moderately slow or moderate
Potential frost action: High
Shrink-swell potential: Low
Surface layer texture: Fine sandy loam
Potential for surface runoff: Low
Wind erosion hazard: Moderate

Use and Management Considerations

Cropland

- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.

Pastureland

- The root systems of plants may be damaged by frost action.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Soil wetness may limit the use of this soil by log trucks.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated

effluent may pollute the water table in the area of the absorption field.

- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.

Component Interpretive Groups

HANEY
Pasture and hayland suitability group: A-6
Hydric soil: No

HaB-Haney fine sandy loam, 2 to 6 percent slopes

Setting
Landform: Stream terraces and beach ridges
Position on the landform: Summits, shoulders and backslopes

Map Unit Composition
Haney and similar components: 95 percent

Similar Components
Surface layer and subsoil more than 40 inches thick
No grayish-brown mottles in the upper part of the subsoil
Darker colored surface layer
Oshtemo soils
Digby soils

Contrasting Components
Mermill soils: 3 percent
Hoytville soils: 2 percent

Map Unit Interpretive Groups
Land capability classification: 2e
Prime farmland: All areas are prime farmland

Soil Properties and Qualities

HANEY
Available water capacity: About 7.3 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 5.0 to 15 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 1.5 to 2.0 feet
Water table kind: Apparent
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Beach sand over alluvium
Permeability: Moderately slow or moderate
Potential frost action: High
Shrink-swell potential: Low
Surface layer texture: Fine sandy loam
Potential for surface runoff: Low
Wind erosion hazard: Moderate

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.

Pastureland

- Erosion control is needed when pastures are renovated.
- The root systems of plants may be damaged by frost action.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.

- Soil wetness may limit the use of this soil by log trucks.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.

Component Interpretive Groups

HANEY
Pasture and hayland suitability group: A-6
Hydric soil: No

HdA-Haney loam, 0 to 2 percent slopes

Setting
Landform: Stream terraces
Position on the landform: Summits and shoulders

Map Unit Composition
Haney and similar components: 95 percent

Similar Components
Surface layer and subsoil more than 40 inches thick
No grayish-brown mottles in the upper part of the subsoil
Darker colored surface layer
Ross soils
Medway soils
Digby soils

Contrasting Components
Millgrove soils: 5 percent

Map Unit Interpretive Groups
Land capability classification: 1
Prime farmland: All areas are prime farmland

Soil Properties and Qualities

HANEY
Available water capacity: About 7.3 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 8.0 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 1.5 to 2.0 feet
Water table kind: Apparent
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Alluvium
Permeability: Moderately slow or moderate
Potential frost action: High
Shrink-swell potential: Low
Surface layer texture: Loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.

Pastureland

- The root systems of plants may be damaged by frost action.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.

Component Interpretive Groups

HANEY
Pasture and hayland suitability group: A-6
Hydric soil: No

HdB-Haney loam, 2 to 6 percent slopes

Setting
Landform: Stream terraces
Position on the landform: Backslopes, shoulders, and summits

Map Unit Composition
Haney and similar components: 100 percent

Similar Components
Surface layer and subsoil more than 40 inches thick
No grayish-brown mottles in the upper part of the subsoil
Darker colored surface layer
Moderately eroded areas that are more sloping
Ross soils
Medway soils
Digby soils

Map Unit Interpretive Groups
Land capability classification: 2e
Prime farmland: All areas are prime farmland

Soil Properties and Qualities

HANEY
Available water capacity: About 7.7 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 8.0 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 1.5 to 2.0 feet
Water table kind: Apparent

Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Alluvium
Permeability: Moderately slow or moderate
Potential frost action: High
Shrink-swell potential: Low
Surface layer texture: Loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.

Pastureland

- Erosion control is needed when pastures are renovated.
- The root systems of plants may be damaged by frost action.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.

Component Interpretive Groups

HANEY
Pasture and hayland suitability group: A-6
Hydric soil: No

HeC-Haney and Rawson loams, 6 to 12 percent slopes

Setting
Landform: Stream terraces
Position on the landform: Shoulders and backslopes

Map Unit Composition
Haney and similar components: 50 percent
Rawson and similar components: 50 percent

Similar Components
Surface layer and subsoil more than 40 inches thick
No grayish-brown mottles in the upper part of the subsoil
Darker colored surface layer
Digby

Map Unit Interpretive Groups
Land capability classification: 3e
Prime farmland: Not prime farmland

Soil Properties and Qualities

HANEY
Available water capacity: About 7.7 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 8.0 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 1.5 to 2.0 feet
Water table kind: Apparent
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Alluvium
Permeability: Moderately slow or moderate
Potential frost action: High
Shrink-swell potential: Low
Surface layer texture: Loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- The root systems of plants may be damaged by frost action.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The slope may restrict the use of some mechanical planting equipment.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.

- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- Because of the slope, designing local roads and streets is difficult.

Component Interpretive Groups

HANEY
Pasture and hayland suitability group: A-6
Hydric soil: No

Soil Properties and Qualities

RAWSON
Available water capacity: About 7.0 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 8.0 to 16 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 2.0 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material:
Permeability: Very slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- The rooting depth of crops may be restricted by the high clay content.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The slope may restrict the use of some mechanical planting equipment.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may

be required to ensure satisfactory performance.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines and seepage of poorly treated effluent is a concern.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.
- Because of the slope, designing local roads and streets is difficult.

Component Interpretive Groups

RAWSON
Pasture and hayland suitability group: F-5
Hydric soil: No

HkA-Haskins fine sandy loam, 0 to 2 percent slopes

Setting
Landform: Knolls and ridges on stream terraces and outwash plains
Position on the landform: Shoulders and summits

Map Unit Composition
Haskins and similar components: 95 percent

Similar Components
Loamy surface layer and subsoil 14 to 20 inches thick
Darker colored surface layer less than 10 inches thick
Gently sloping areas
Rimer soils
Loam surface layer

Contrasting Components
Mermill soils: 3 percent
Hoytville soils: 2 percent

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

HASKINS
Available water capacity: About 6.3 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 5.0 to 12 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 2.0 percent
Parent material: Glaciolacustrine deposits over basal till
Permeability: Very slow
Potential frost action: High
Shrink-swell potential: High
Surface layer texture: Fine sandy loam
Potential for surface runoff: High
Wind erosion hazard: Moderate

Use and Management Considerations

Cropland

- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- The root system of winter grain crops may be damaged by frost action.
- The rooting depth of crops may be restricted by the high clay content.

- The movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- Burning may destroy organic matter.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

HASKINS
Pasture and hayland suitability group: C-2
Hydric soil: No

HIA-Haskins loam, 0 to 2 percent slopes

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

Map Unit Composition
Haskins and similar components: 95 percent

Similar Components
Loamy surface layer and subsoil 14 to 20 inches thick
Darker colored surface layer less than 10 inches thick
Gently sloping areas
Rimer soils
Fine sandy loam surface layer

Contrasting Components
Mermill soils: 3 percent
Hoytville soils: 2 percent

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

HASKINS
Available water capacity: About 6.5 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 6.0 to 15 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Glaciolacustrine deposits over basal till
Permeability: Very slow
Potential frost action: High
Shrink-swell potential: High
Surface layer texture: Loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- The rooting depth of crops may be restricted by the high clay content.
- The movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed

to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

HASKINS
Pasture and hayland suitability group: C-2
Hydric soil: No

HlB-Haskins loam, 2 to 6 percent slopes

Setting
Landform: Rises on stream terraces and beach ridges
Position on the landform: Backslopes, summits, and shoulders

Map Unit Composition
Haskins and similar components: 85 percent

Contrasting Components
Hoytville soils: 5 percent
Pewamo soils: 5 percent
Sloan soils: 5 percent
Digby loam soils:
Nappanee loam soils:
Fine sandy loam surface layer:
Nearly level areas:
Silt loam surface layer:

Map Unit Interpretive Groups
Land capability classification: 2e
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

HASKINS
Available water capacity: About 7.3 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 6.0 to 15 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Glaciolacustrine deposits over basal till
Permeability: Very slow
Potential frost action: High
Shrink-swell potential: High
Surface layer texture: Loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- The root system of winter grain crops may be damaged by frost action.
- The rooting depth of crops may be restricted by the high clay content.
- The movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Erosion control is needed when pastures are renovated.
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- Special design of roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

HASKINS
Pasture and hayland suitability group: C-2
Hydric soil: No

HnA-Haskins fine sandy loam, stratified substratum, 0 to 2 percent slopes

Setting
Landform: Knolls on beach ridges, stream terraces, and outwash plains
Position on the landform: Summits and shoulders

Map Unit Composition
Haskins and similar components: 95 percent

Similar Components
Loamy surface layer and subsoil 14 to 20 inches thick
Darker colored surface layer less than 10 inches thick
Non-stratified Haskins
Rimer, stratified substratum

Contrasting Components
Mermill, stratified substratum soils: 5 percent

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

HASKINS
Available water capacity: About 7.5 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 5.0 to 12 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 64 inches
Depth to the top of the seasonal high water table: 0.5 to 1.0 feet
Water table kind: Perched
Ponding: None

Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 2.0 percent
Parent material: Glaciolacustrine deposits over basal till
Permeability: Very slow
Potential frost action: High
Shrink-swell potential: High
Surface layer texture: Fine sandy loam
Potential for surface runoff: High
Wind erosion hazard: Moderate

Use and Management Considerations

Cropland

- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- The root system of winter grain crops may be damaged by frost action.
- The rooting depth of crops may be restricted by the high clay content.
- The movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- Burning may destroy organic matter.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

HASKINS
Pasture and hayland suitability group: C-2

Hydric soil: No

Ho-Hoytville clay loam

Setting
Landform: Flats on lake plains

Map Unit Composition
Hoytville and similar components: 95 percent

Similar Components
Thicker surface layer and subsoil
Mermill soils
Thinner surface layer and subsoil

Contrasting Components
Haskins soils: 3 percent
Rimer soils: 2 percent

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

HOYTVILLE
Available water capacity: About 7.4 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 24 to 35 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 0.0 to 1.0 feet
Water table kind: Perched
Ponding: Long
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 6.0 percent
Parent material: Wave-planed basal till
Permeability: Slow
Potential frost action: High
Shrink-swell potential: High
Surface layer texture: Clay loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- A combination of surface and subsurface drainage helps to remove excess water.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Figure 3. Ponding on Hoytville soil. Water that stands for extended periods can damage crops.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Ponding restricts the safe use of roads by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.

Building Sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

HOYTVILLE
Pasture and hayland suitability group: C-1
Hydric soil: Yes

Hp-Hoytville silty clay loam, 0 to 1 percent slopes

Setting
Landform: Flats, drainageways, and depressions on lake plains

Map Unit Composition
Hoytville and similar components: 90 percent

Similar Components
Silty clay surface layer
Surface layer more than 10 inches thick
More sand and less clay in the subsoil
Areas underlain with lacustrine sediments
Less clay in the substratum

Contrasting Components
Nappanee soils: 10 percent

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

HOYTVILLE
Available water capacity: About 6.8 inches to a depth of 58 inches
Cation-exchange capacity of the surface layer: 17 to 35 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 50 to 70 inches
Depth to the top of the seasonal high water table: 0.0 to 1.0 feet
Water table kind: Perched
Ponding: Brief
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 6.0 percent
Parent material: Wave-planed basal till
Permeability: Moderately slow in the upper part of the subsoil, slow in the lower part of the subsoil, and slow or very slow in the substratum
Potential frost action: High

Shrink-swell potential: Moderate
Surface layer texture: Silty clay loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- A combination of surface and subsurface drainage helps to remove excess water.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Ponding restricts the safe use of roads by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

HOYTVILLE
Pasture and hayland suitability group: C-1
Hydric soil: Yes

Hr-Hoytville clay loam, 0 to 1 percent slopes

Setting
Landform: Depressions, drainageways, and extensive flats on lake plains

Map Unit Composition
Hoytville and similar components: 95 percent

Similar Components
Carbonates between 10 and 30 inches
Less clay in the subsoil
Silty clay loam surface layer
Dark colored surface layer more than 10 inches thick
Lighter colored surface layer
Silty clay or clay surface layer
Bedrock at 48 to 60 inches

Contrasting Components
Nappanee soils: 4 percent
Loamy or sandy somewhat poorly drained soils: 1 percent

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

HOYTVILLE
Available water capacity: About 7.3 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 17 to 36 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 50 to 70 inches
Depth to the top of the seasonal high water table: 0.0 to 1.0 feet
Water table kind: Perched
Ponding: Brief
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 6.0 percent
Parent material: Wave-planed basal till
Permeability: Very slow or slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Clay loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- A combination of surface and subsurface drainage helps to remove excess water.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Ponding restricts the safe use of roads by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.

Building Sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

HOYTVILLE
Pasture and hayland suitability group: C-1
Hydric soil: Yes

Hs-Hoytville silty clay, 0 to 1 percent slopes

Setting
Landform: Depressions, drainageways, and extensive flats on lake plains

Map Unit Composition
Hoytville and similar components: 95 percent

Similar Components
Silty clay loam or clay surface layer
Lighter colored surface layer
Thicker subsoil
Dark colored surface layer more than 10 inches thick
Less clay in the subsoil

Contrasting Components
Nappanee soils: 5 percent

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

HOYTVILLE
Available water capacity: About 6.1 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 22 to 41 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 50 to 70 inches
Depth to the top of the seasonal high water table: 0.0 to 1.0 feet
Water table kind: Perched
Ponding: Brief
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 6.0 percent
Parent material: Wave- planed basal till
Permeability: Very slow or slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silty clay
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent

crusting, improves tilth, and increases the rate of water infiltration.

- A combination of surface and subsurface drainage helps to remove excess water.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Ponding restricts the safe use of roads by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of this soil restricts the use of harvesting equipment and roads during wet periods.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- Burning may destroy organic matter.

Building Sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

HOYTVILLE
Pasture and hayland suitability group: C-1
Hydric soil: Yes

Hv-Hoytville clay

Setting
Landform: Extensive flats on lake plains

Map Unit Composition
Hoytville and similar components: 90 percent

Similar Components
Thinner surface layer and subsoil
Mermill soils
Thicker surface layer and subsoil

Contrasting Components
Nappanee soils: 4 percent
Haskins soils: 3 percent
Rimer soils: 3 percent

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

HOYTVILLE
Available water capacity: About 7.2 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 24 to 40 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 0.0 to 1.0 feet
Water table kind: Perched
Ponding: Long
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 6.0 percent
Parent material: Wave-planed basal till
Permeability: Slow
Potential frost action: High
Shrink-swell potential: High
Surface layer texture: Clay
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- A combination of surface and subsurface drainage helps to remove excess water.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Ponding restricts the safe use of roads by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of this soil restricts the use of harvesting equipment and roads during wet periods.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- Burning may destroy organic matter.

Building Sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may

be needed. The soil is generally unsuited to building site development.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

HOYTVILLE
Pasture and hayland suitability group: C-2
Hydric soil: Yes

Hw-Hoytville clay, thin solum variant

Setting
Landform: Flats on lake plains

Map Unit Composition
Hoytville Variant and similar components: 100 percent

Similar Components
Mermill soils

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

HOYTVILLE
Available water capacity: About 4.4 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 24 to 40 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 44 inches
Depth to the top of the seasonal high water table: 0.0 to 1.0 feet
Water table kind: Perched
Ponding: Long
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 6.0 percent
Parent material: Wave-planed basal till
Permeability: Slow
Potential frost action: High
Shrink-swell potential: High
Surface layer texture: Clay
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Plants may suffer from moisture stress because of the limited available water capacity.
- The root system of winter grain crops may be damaged by frost action.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- A combination of surface and subsurface drainage helps to remove excess water.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Ponding restricts the safe use of roads by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of this soil restricts the use of harvesting equipment and roads during wet periods.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

HOYTVILLE
Pasture and hayland suitability group: C-1
Hydric soil: Yes

KeA-Kibbie loamy fine sand, 0 to 2 percent slopes

Setting
Landform: Rises and deltas on lake plains
Position on the landform: Shoulders and summits

Map Unit Composition
Kibbie and similar components: 90 percent

Similar Components
Less clay in the subsoil
Slope of 2 to 6 percent
Darker colored surface layer
Till at 40 to 60 inches
Moderately well drained soils
Fine sandy loam surface layer

Contrasting Components
Till at 20 to 40 inches: 10 percent

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

KIBBIE
Available water capacity: About 10.6 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 2.0 to 15 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.5 feet
Water table kind: Apparent
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 3.0 percent
Parent material: Stratified silty and loamy glaciolacustrine deposits
Permeability: Moderately slow or moderate
Potential frost action: High
Shrink-swell potential: Low
Surface layer texture: Loamy fine sand
Potential for surface runoff: Negligible
Wind erosion hazard: Severe

Use and Management Considerations

Cropland

- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Soil wetness may limit the use of this soil by log trucks.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- Special design of roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

KIBBIE
Pasture and hayland suitability group: C-1
Hydric soil: No

KfA-Kibbie fine sandy loam, 0 to 2 percent slopes

Setting
Landform: Knolls and ridges on lake plains
Position on the landform: Summits and shoulders

Map Unit Composition
Kibbie and similar components: 100 percent

Similar Components
Darker colored surface layer
Gently sloping soils
Tedrow Variant soils
Haskins fine sandy loam, stratified substratum

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

KIBBIE
Available water capacity: About 8.9 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 5.0 to 20 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 72 inches
Depth to the top of the seasonal high water table: 0.5 to 1.0 feet
Water table kind: Apparent
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 3.0 percent
Parent material: Glaciofluvial deposits over glaciolacustrine deposits
Permeability: Moderately slow or moderate
Potential frost action: High
Shrink-swell potential: Low
Surface layer texture: Fine sandy loam
Potential for surface runoff: Low
Wind erosion hazard: Moderate

Use and Management Considerations

Cropland

- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed

to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

KIBBIE
Pasture and hayland suitability group: C-1
Hydric soil: No

KIA-Kibbie loam, 0 to 2 percent slopes

Setting
Landform: Knolls and ridges on lake plains
Position on the landform: Shoulders and summits

Map Unit Composition
Kibbie and similar components: 100 percent

Similar Components
Tuscola soils
Darker colored surface layer
Gently sloping areas
Fine sandy loam surface layer

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

KIBBIE
Available water capacity: About 9.4 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 5.0 to 20 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 71 inches
Depth to the top of the seasonal high water table: 0.5 to 1.0 feet
Water table kind: Apparent
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 3.0 percent
Parent material: Glaciofluvial deposits over glaciolacustrine deposits
Permeability: Moderately slow or moderate
Potential frost action: High
Shrink-swell potential: Low
Surface layer texture: Loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

KIBBIE
Pasture and hayland suitability group: C-1
Hydric soil: No

La-Latty clay

Setting
Landform: Extensive flats on lake plains

Map Unit Composition
Latty and similar components: 95 percent

Similar Components
Mermill soils
Hoytville soils

Contrasting Components
Nappanee soils: 3 percent
Haskins soils: 2 percent

Map Unit Interpretive Groups
Land capability classification: 3w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

LATTY
Available water capacity: About 6.6 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 28 to 40 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 71 inches
Depth to the top of the seasonal high water table: 0.0 to 1.0 feet
Water table kind: Apparent
Ponding: Long
Depth of ponding: 0.0 to 0.5 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 5.0 percent
Parent material: Lacustrine deposits
Permeability: Very slow
Potential frost action: Moderate
Shrink-swell potential: High
Surface layer texture: Clay
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- A combination of surface and subsurface drainage helps to remove excess water.

- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Ponding restricts the safe use of roads by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Burning may destroy organic matter.

Building Sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

LATTY
Pasture and hayland suitability group: C-2
Hydric soil: Yes

Lb-Latty silty clay

Setting
Landform: Depressions and flats on lake plains

Map Unit Composition
Latty and similar components: 85 percent

Similar Components
Nappanee soils

Contrasting Components
Haskins soils: 4 percent

Map Unit Interpretive Groups
Land capability classification: 3w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

LATTY
Available water capacity: About 6.6 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 28 to 40 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches

Depth to the top of the seasonal high water table: 0.0 to 1.0 feet
Water table kind: Perched
Ponding: Long
Depth of ponding: 0.0 to 0.5 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 5.0 percent
Parent material: Lacustrine deposits
Permeability: Very slow
Potential frost action: Moderate
Shrink-swell potential: High
Surface layer texture: Silty clay
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- A combination of surface and subsurface drainage helps to remove excess water.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Ponding restricts the safe use of roads by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of this soil restricts the use of harvesting equipment and roads during wet periods.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and

streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

LATTY
Pasture and hayland suitability group: C-2
Hydric soil: Yes

Le-Lenawee loam

Setting
Landform: Flats on lake plains

Map Unit Composition
Lenawee and similar components: 95 percent

Similar Components
Thicker surface layer
Silty clay loam surface layer

Contrasting Components
Del Rey soils: 5 percent

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

LENAWEE
Available water capacity: About 8.7 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 15 to 30 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 61 inches
Depth to the top of the seasonal high water table: 0.0 to 1.0 feet
Water table kind: Apparent
Ponding: Long
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 5.0 percent
Parent material: Lacustrine deposits
Permeability: Slow or moderately slow
Potential frost action: High
Shrink-swell potential: High
Surface layer texture: Loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- The rooting depth of crops may be restricted by the high clay content.
- A combination of surface and subsurface drainage helps to remove excess water.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Ponding restricts the safe use of roads by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building Sites

- Because water tends to pond on this soil, the period when excavations can be made may

be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

LENAWEE
Pasture and hayland suitability group: C-1
Hydric soil: Yes

Lf-Lenawee silty clay loam

Setting
Landform: Flats on lake plains

Map Unit Composition
Lenawee and similar components: 95 percent

Similar Components
Thicker surface layer
Toledo soils

Contrasting Components
Del Rey soils: 5 percent

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

LENAWEE
Available water capacity: About 8.7 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 15 to 30 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 61 inches
Depth to the top of the seasonal high water table: 0.0 to 1.0 feet
Water table kind: Apparent
Ponding: Long
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 12.0 percent
Parent material: Lacustrine deposits
Permeability: Slow or moderately slow
Potential frost action: High
Shrink-swell potential: High
Surface layer texture: Silty clay loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- A combination of surface and subsurface drainage helps to remove excess water.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.

- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Ponding restricts the safe use of roads by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Burning may destroy organic matter.

Building Sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

LENAWEE
Pasture and hayland suitability group: C-1
Hydric soil: Yes

LwB2-Lucas silty clay loam, 2 to 6 percent slopes, moderately eroded

Setting
Landform: Drainageways on lake plains
Position on the landform: Backslopes and shoulders

Map Unit Composition
Lucas and similar components: 95 percent

Similar Components
Seward soils

Contrasting Components
Severely eroded areas: 5 percent

Map Unit Interpretive Groups
Land capability classification: 3e
Prime farmland: All areas are prime farmland

Soil Properties and Qualities

LUCAS
Available water capacity: About 6.3 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 16 to 30 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 2.0 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Glaciolacustrine deposits

Permeability: Very slow or slow
Potential frost action: Moderate
Shrink-swell potential: High
Surface layer texture: Silty clay loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Erosion control is needed when pastures are renovated.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Burning may destroy organic matter.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

LUCAS
Pasture and hayland suitability group: F-5
Hydric soil: No

LwC2-Lucas silty clay loam, 6 to 12 percent slopes, moderately eroded

Setting
Landform: Drainageways on lake plains
Position on the landform: Backslopes and shoulders

Map Unit Composition
Lucas and similar components: 95 percent

Similar Components
St. Clair soils

Contrasting Components
Severely eroded areas: 5 percent

Map Unit Interpretive Groups
Land capability classification: 4e
Prime farmland: Not prime farmland

Soil Properties and Qualities

LUCAS
Available water capacity: About 6.3 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 16 to 30 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 2.0 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Glaciolacustrine deposits
Permeability: Very slow or slow
Potential frost action: Moderate
Shrink-swell potential: High
Surface layer texture: Silty clay loam
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Burning may destroy organic matter.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines and seepage of poorly treated effluent is a concern.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.
- Because of the slope, designing local roads and streets is difficult.

Component Interpretive Groups

LUCAS
Pasture and hayland suitability group: F-5
Hydric soil: No

LxC3-Lucas silty clay, 6 to 12 percent slopes, severely eroded

Setting
Landform: Drainageways on lake plains
Position on the landform: Shoulders and backslopes

Map Unit Composition
Lucas and similar components: 95 percent

Similar Components
St. Clair soils

Contrasting Components
Moderately eroded areas: 5 percent

Map Unit Interpretive Groups
Land capability classification: 6e
Prime farmland: Not prime farmland

Soil Properties and Qualities

LUCAS
Available water capacity: About 6.3 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 18 to 34 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 2.0 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.2 to 2.0 percent
Parent material: Glaciolacustrine deposits
Permeability: Very slow or slow
Potential frost action: Moderate
Shrink-swell potential: High
Surface layer texture: Silty clay
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Burning may destroy organic matter.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines and seepage of poorly treated effluent is a concern.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.
- Because of the slope, designing local roads and streets is difficult.

Component Interpretive Groups

LUCAS
Pasture and hayland suitability group: F-5
Hydric soil: No

LxE3-Lucas silty clay, 12 to 45 percent slopes, severely eroded

Setting
Landform: Drainageways on lake plains
Position on the landform: Backslopes

Map Unit Composition
Lucas and similar components: 95 percent

Similar Components
St. Clair soils

Contrasting Components
Less eroded areas: 5 percent

Map Unit Interpretive Groups
Land capability classification: 7e
Prime farmland: Not prime farmland

Soil Properties and Qualities

LUCAS
Available water capacity: About 6.3 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 18 to 34 meq per 100 grams
Depth class: Very deep

Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 2.0 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Glaciolacustrine deposits
Permeability: Very slow or slow
Potential frost action: Moderate
Shrink-swell potential: High
Surface layer texture: Silty clay
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- The slope may restrict the use of some farm equipment.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during construction of haul roads and log landings.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- The slope creates unsafe operating conditions and reduces the operating efficiency of harvesting and mechanical planting equipment.
- Because of the slope, the use of mechanical planting equipment is not practical.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- The slope restricts the use of equipment for preparing this site for planting and seeding.
- Burning may destroy organic matter.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.
- Because of the slope, designing local roads and streets is difficult.

Component Interpretive Groups

LUCAS
Pasture and hayland suitability group: F-6

Hydric soil: No

Mb-Mermill-Aurand complex, 0 to 1 percent slopes

Setting
Landform: Knolls, rises, depressions, drainageways, and extensive flats on lake plains
Position on the landform: Summits and shoulders

Map Unit Composition
Mermill and similar components: 60 percent
Aurand and similar components: 35 percent

Similar Components
Less clay in the surface layer and subsoil
More clay in the surface layer and subsoil
Moderately well drained soils
Till between 40 and 60 inches
Lighter colored surface layer
Somewhat poorly drained, fine textured soil

Contrasting Components
Rimer soils: 5 percent

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

MERMILL
Available water capacity: About 7.5 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 12 to 28 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 0.0 to 1.0 feet
Water table kind: Perched
Ponding: Brief
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 6.0 percent
Parent material: Loamy glaciolacustrine deposits over basal till
Permeability: Very slow or slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- A combination of surface and subsurface drainage helps to remove excess water.
- The movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Ponding restricts the safe use of roads by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building Sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.

Septic Tank Absorption Fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Special design of roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

MERMILL
Pasture and hayland suitability group: C-1
Hydric soil: Yes

Soil Properties and Qualities

AURAND
Available water capacity: About 6.4 inches to a depth of 51 inches
Cation-exchange capacity of the surface layer: 8.8 to 28 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 40 to 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 6.0 percent
Parent material: Loamy glaciolacustrine deposits over basal till
Permeability: Very slow or slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- In some areas the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and

proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- Special design of roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

AURAND
Pasture and hayland suitability group: C-1
Hydric soil: No

Mc-Mermill silty clay loam

Setting
Landform: Drainageways, depressions, and flats on lake plains

Map Unit Composition
Mermill and similar components: 95 percent

Contrasting Components
Haskins soils: 5 percent
Hoytville soils:
Paulding soils:
Toledo soils:
Clay loam surface layer:

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

MERMILL
Available water capacity: About 7.8 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 19 to 28 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 0.0 to 0.5 feet
Water table kind: Apparent
Ponding: Long
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 6.0 percent
Parent material: Glaciolacustrine deposits over till
Permeability: Very slow
Potential frost action: High
Shrink-swell potential: High
Surface layer texture: Silty clay loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- A combination of surface and subsurface drainage helps to remove excess water.
- The movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Ponding restricts the safe use of roads by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Component Interpretive Groups

MERMILL
Pasture and hayland suitability group: C-2
Hydric soil: Yes

Md-Medway silt loam

Setting
Landform: Flood plains

Map Unit Composition
Medway and similar components: 100 percent

Similar Components
Ross soils
Genesee soils

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: All areas are prime farmland

Soil Properties and Qualities

MEDWAY
Available water capacity: About 10.4 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 13 to 28 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 2.0 to 3.0 feet
Water table kind: Apparent
Ponding: None
Drainage class: Moderately well drained
Flooding: Occasional
Organic matter content in the surface layer: 3.0 to 6.0 percent
Parent material: Alluvium
Permeability: Moderately slow or moderate
Potential frost action: High
Shrink-swell potential: Low
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.

- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Controlling traffic can minimize soil compaction.
- Measures that protect the soil from scouring and minimize the loss of crop residue by floodwaters are needed.
- Small grain crops may be damaged by flooding in winter and spring.

Pastureland

- Forage production can be improved by seeding grass-legume mixtures that are tolerant of flooding.
- Sediment left on forage plants after a flood event may reduce palatability and forage intake by the grazing animal.
- The root systems of plants may be damaged by frost action.

Woodland

- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Flooding may result in damage to haul roads and increased maintenance costs.
- Flooding restricts the safe use of roads by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building Sites

- Under normal weather conditions, this soil is subject to occasional flooding. The flooding may result in physical damage and costly repairs to buildings. This soil is generally unsuited to homesites. Special design of some structures, such as farm outbuildings, may be needed to prevent damage caused by flooding.

Septic Tank Absorption Fields

- This soil is generally unsuited to septic tank absorption fields. The flooding in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Rapidly moving floodwaters may damage some components of septic systems.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Special design of roads and streets is needed to prevent the structural damage caused by low soil strength.
- Special design of roads and bridges is needed to prevent the damage caused by flooding.

Component Interpretive Groups

MEDWAY
Pasture and hayland suitability group: A-5
Hydric soil: No

Me-Mermill loam

Setting
Landform: Flats on lake plains

Map Unit Composition
Mermill and similar components: 95 percent

Similar Components
Thicker surface layer
Fine sandy loam surface layer
Silt loam surface layer
Hoytville soils

Contrasting Components
Haskins soils: 5 percent

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

MERMILL
Available water capacity: About 8.1 inches to a depth of 60 inches

Cation-exchange capacity of the surface layer: 13 to 26 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 0.0 to 1.0 feet
Water table kind: Perched
Ponding: Long
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 6.0 percent
Parent material: Glaciolacustrine deposits over basal till
Permeability: Very slow
Potential frost action: High
Shrink-swell potential: High
Surface layer texture: Loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- The rooting depth of crops may be restricted by the high clay content.
- A combination of surface and subsurface drainage helps to remove excess water.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Ponding restricts the safe use of roads by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building Sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Component Interpretive Groups

MERMILL
Pasture and hayland suitability group: C-1
Hydric soil: Yes

Mf-Mermill clay loam

Setting
Landform: Flats on lake plains

Map Unit Composition
Mermill and similar components: 95 percent

Similar Components
Thicker surface layer
Hoytville soils

Contrasting Components
Haskins soils: 5 percent

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

MERMILL
Available water capacity: About 7.9 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 19 to 28 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 0.0 to 1.0 feet
Water table kind: Perched
Ponding: Long
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 6.0 percent
Parent material: Glaciolacustrine deposits over basal till
Permeability: Very slow
Potential frost action: High
Shrink-swell potential: High
Surface layer texture: Clay loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- A combination of surface and subsurface drainage helps to remove excess water.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Ponding restricts the safe use of roads by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building Sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.
- In some areas the high content of clay in the subsurface layer increases the difficulty of

digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Component Interpretive Groups

MERMILL
Pasture and hayland suitability group: C-1
Hydric soil: Yes

Mg-Mermill loam, stratified substratum

Setting
Landform: Flats on lake plains

Map Unit Composition
Mermill and similar components: 95 percent

Contrasting Components
Haskins, stratified substratum soils: 3 percent
Rimer, stratified substratum soils: 2 percent

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

MERMILL
Available water capacity: About 8.3 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 13 to 26 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 66 inches
Depth to the top of the seasonal high water table: 0.0 to 1.0 feet
Water table kind: Perched
Ponding: Long
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 6.0 percent
Parent material: Glaciolacustrine deposits over basal till
Permeability: Very slow or slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- The rooting depth of crops may be restricted by the high clay content.
- A combination of surface and subsurface drainage helps to remove excess water.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.

- Soil wetness may limit the use of this soil by log trucks.
- Ponding restricts the safe use of roads by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building Sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Component Interpretive Groups

MERMILL
Pasture and hayland suitability group: C-1
Hydric soil: Yes

Mh-Millgrove loam

Setting
Landform: Flats on lake plains

Map Unit Composition
Millgrove and similar components: 95 percent

Similar Components
Mermill loam, stratified substratum
Thicker surface layer and subsoil
Fine sandy loam surface layer

Contrasting Components
Digby soils: 3 percent
Haskins soils: 2 percent

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

MILLGROVE
Available water capacity: About 7.4 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 15 to 30 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 72 inches
Depth to the top of the seasonal high water table: 0.0 to 1.0 feet
Water table kind: Apparent
Ponding: Long
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 8.0 percent
Parent material: Outwash
Permeability: Moderately slow or moderate
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- A combination of surface and subsurface drainage helps to remove excess water.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Ponding restricts the safe use of roads by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building Sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Special design of roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

MILLGROVE
Pasture and hayland suitability group: C-1
Hydric soil: Yes

Mk-Millgrove clay loam

Setting
Landform: Flats on lake plains

Map Unit Composition
Millgrove and similar components: 95 percent

Similar Components
Thicker surface layer and subsoil
Loam surface layer
Hoytville clay loam soils

Contrasting Components
Digby soils: 5 percent

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

MILLGROVE
Available water capacity: About 7.4 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 20 to 32 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 72 inches
Depth to the top of the seasonal high water table: 0.0 to 1.0 feet
Water table kind: Apparent
Ponding: Long
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 8.0 percent

Parent material: Outwash
Permeability: Moderately slow or moderate
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Clay loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- A combination of surface and subsurface drainage helps to remove excess water.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Ponding restricts the safe use of roads by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building Sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Special design of roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

MILLGROVE
Pasture and hayland suitability group: C-1
Hydric soil: Yes

NaA-Nappanee loam, 0 to 2 percent slopes

Setting
Landform: Lake plains
Position on the landform: Summits and shoulders

Map Unit Composition
Nappanee and similar components: 95 percent

Similar Components
Less clayey subsoil
Darker colored surface layer
Rimer soils
Silty clay loam surface layer

Contrasting Components
Hoytville soils: 5 percent

Map Unit Interpretive Groups
Land capability classification: 3w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

NAPPANEE
Available water capacity: About 6.9 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 10 to 15 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Wave-planed basal till
Permeability: Very slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops may be restricted by the high clay content.
- The movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.

- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

NAPPANEE
Pasture and hayland suitability group: C-2
Hydric soil: No

NaB-Nappanee loam, 2 to 6 percent slopes

Setting

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

Map Unit Composition
Nappanee and similar components: 95 percent

Similar Components
Less clayey subsoil
Haskins soils
Rimer soils
Silty clay loam surface layer

Contrasting Components
Hoytville soils: 5 percent

Map Unit Interpretive Groups
Land capability classification: 3e
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

NAPPANEE
Available water capacity: About 7.1 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 10 to 15 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Wave-planed basal till
Permeability: Very slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- The rooting depth of crops may be restricted by the high clay content.
- The movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Erosion control is needed when pastures are renovated.
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

NAPPANEE
Pasture and hayland suitability group: C-2
Hydric soil: No

NtA-Nappanee silty clay loam, 0 to 2 percent slopes

Setting
Landform: lake plains
Position on the landform: Summits and shoulders

Map Unit Composition
Nappanee and similar components: 95 percent

Similar Components
Less clayey subsoil
Darker colored surface layer
Rimer soils
Haskins soils
Loam surface layer

Contrasting Components
Hoytville soils: 5 percent

Map Unit Interpretive Groups
Land capability classification: 3w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

NAPPANEE
Available water capacity: About 6.6 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 10 to 15 meq per 100 grams

Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Wave-planed basal till
Permeability: Very slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silty clay loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

NAPPANEE
Pasture and hayland suitability group: C-2
Hydric soil: No

NtB-Nappanee silty clay loam, 2 to 6 percent slopes

Setting
Landform: Lake plains
Position on the landform: Backslopes and shoulders

Map Unit Composition
Nappanee and similar components: 95 percent

Similar Components
Less clayey subsoil
Rimer soils
Haskins soils
Loam surface layer

Contrasting Components
Hoytville soils: 5 percent

Map Unit Interpretive Groups
Land capability classification: 3e
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

NAPPANEE
Available water capacity: About 6.6 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 10 to 15 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Wave-planed basal till
Permeability: Very slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silty clay loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Erosion control is needed when pastures are renovated.
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

NAPPANEE
Pasture and hayland suitability group: C-2
Hydric soil: No

NtB2-Nappanee silty clay loam, 2 to 6 percent slopes, moderately eroded

Setting
Landform: Lake plains
Position on the landform: Backslopes and shoulders

Map Unit Composition
Nappanee and similar components: 100 percent

Similar Components
Less clayey subsoil
Slightly eroded areas
Slightly eroded loam surface layer
St. Clair soils

Map Unit Interpretive Groups
Land capability classification: 3e
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

NAPPANEE
Available water capacity: About 6.6 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 10 to 15 meq per 100 grams
Depth class: Very deep

Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Wave-planed basal till
Permeability: Very slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silty clay loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Erosion control is needed when pastures are renovated.
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.

- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

NAPPANEE
Pasture and hayland suitability group: C-2
Hydric soil: No

OaC-Oakville fine sand, 2 to 12 percent slopes

Setting
Landform: Ridges and dunes on lake plains
Position on the landform: Backslopes, shoulders, and summits

Map Unit Composition
Oakville and similar components: 100 percent

Similar Components
Thin lamellae or bands at 50 to 80 inches
Tedrow soils
Ottokee soils

Map Unit Interpretive Groups
Land capability classification: 6s
Prime farmland: Not prime farmland

Soil Properties and Qualities

OAKVILLE
Available water capacity: About 1.8 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 1.0 to 2.0 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 100 inches
Depth to the top of the seasonal high water table: Greater than 6 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Eolian deposits
Permeability: Very rapid
Potential frost action: Low
Shrink-swell potential: Low
Surface layer texture: Fine sand
Potential for surface runoff: Very low
Wind erosion hazard: Severe

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- The limited available water capacity inhibits root development and increases the seedling mortality rate.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- The slope may restrict the use of some mechanical planting equipment.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.

Local Roads and Streets

- Because of the slope, designing local roads and streets is difficult.

Component Interpretive Groups

OAKVILLE
Pasture and hayland suitability group: B-1
Hydric soil: No

ObB-Oakville fine sand, 2 to 6 percent slopes

Setting
Landform: Dunes and beach ridges
Position on the landform: Shoulders and backslopes

Map Unit Composition
Oakville and similar components: 85 percent

Contrasting Components
Granby soils: 4 percent
Ottokee soils: 4 percent
Tedrow soils: 4 percent
Slopes of more than 6 percent: 3 percent

Map Unit Interpretive Groups
Land capability classification: 4s
Prime farmland: Not prime farmland

Soil Properties and Qualities

OAKVILLE
Available water capacity: About 4.2 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 1.0 to 2.0 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: Greater than 6.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Eolian deposits
Permeability: Very rapid
Potential frost action: Low
Shrink-swell potential: Low
Surface layer texture: Fine sand
Potential for surface runoff: Negligible
Wind erosion hazard: Severe

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.

- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Sandy layers in this soil increase the maintenance of haul roads and log landings.
- Sandy layers may slough, thus reducing the efficiency of mechanical planting equipment.
- Burning may destroy organic matter.

Building Sites

- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- This soil is well suited to use as building sites.

Septic Tank Absorption Fields

- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.

Local Roads and Streets

- This soil is well suited to use as a site for local roads and streets.

Component Interpretive Groups

OAKVILLE
Pasture and hayland suitability group: B-1
Hydric soil: No

ObC-Oakville fine sand, 6 to 12 percent slopes

Setting
Landform: Beach ridges and dunes
Position on the landform: Backslopes

Map Unit Composition
Oakville and similar components: 85 percent

Contrasting Components
Ottokee soils: 5 percent
Spinks soils: 5 percent
Tedrow soils: 5 percent

Map Unit Interpretive Groups
Land capability classification: 6s
Prime farmland: Not prime farmland

Soil Properties and Qualities

OAKVILLE
Available water capacity: About 4.4 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 1.0 to 2.0 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: Greater than 6 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Eolian deposits
Permeability: Rapid
Potential frost action: Low
Shrink-swell potential: Low
Surface layer texture: Fine sand
Potential for surface runoff: Very low
Wind erosion hazard: Severe

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Sandy layers in this soil increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Sandy layers may slough, thus reducing the efficiency of mechanical planting equipment.
- The slope may restrict the use of some mechanical planting equipment.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.

Local Roads and Streets

- Because of the slope, designing local roads and streets is difficult.

Component Interpretive Groups

OAKVILLE
Pasture and hayland suitability group: B-1
Hydric soil: No

OsB-Oshtemo sandy loam, 2 to 6 percent slopes

Setting
Landform: Beach ridges
Position on the landform: Summits, shoulders, and backslopes.

Map Unit Composition
Oshtemo and similar components: 100 percent

Similar Components
Less clay in the subsoil
Darker colored surface layer
Seward soils
Rawson soils

Map Unit Interpretive Groups
Land capability classification: 3s
Prime farmland: All areas are prime farmland

Soil Properties and Qualities

OSHTEMO
Available water capacity: About 6.9 inches to a depth of 60 inches

Cation-exchange capacity of the surface layer: 2.0 to 12 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 70 inches
Depth to the top of the seasonal high water table: Greater than 4 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 3.0 percent
Parent material: Eolian deposits over glaciolacustrine deposits
Permeability: Moderately rapid
Potential frost action: Low
Shrink-swell potential: Low
Surface layer texture: Sandy loam
Potential for surface runoff: Very low
Wind erosion hazard: Moderate

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.

Pastureland

- Erosion control is needed when pastures are renovated.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- This soil is well suited to use as building sites.

Septic Tank Absorption Fields

- This soil is well suited to use as a site for septic tank absorption fields.

Local Roads and Streets

- This soil is well suited to use as a site for local roads and streets.

Component Interpretive Groups

OSHTEMO
Pasture and hayland suitability group: A-1
Hydric soil: No

OtB-Ottokee fine sand, 1 to 5 percent slopes

Setting
Landform: Beach ridges and dunes
Position on the landform: Backslopes, shoulders, and summits

Map Unit Composition
Ottokee and similar components: 100 percent

Similar Components
Thicker horizon of clay accumulation in the subsoil
Tedrow soils

Map Unit Interpretive Groups
Land capability classification: 3s
Prime farmland: Not prime farmland

Soil Properties and Qualities

OTTOKEE
Available water capacity: About 1.9 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 2.0 to 9.0 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 81 inches
Depth to the top of the seasonal high water table: 2.5 to 3.0 feet
Water table kind: Apparent
Ponding: None
Drainage class: Moderately well drained
Flooding: None

Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Eolian deposits over glaciolacustrine deposits
Permeability: Moderately rapid
Potential frost action: Low
Shrink-swell potential: Low
Surface layer texture: Fine sand
Potential for surface runoff: Negligible
Wind erosion hazard: Severe

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- The limited available water capacity inhibits root development and increases the seedling mortality rate.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. Special design of structures is needed to prevent damage caused by wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- This soil is well suited to use as a site for local roads and streets.

Component Interpretive Groups

OTTOKEE
Pasture and hayland suitability group: B-1
Hydric soil: No

OuB-Ottokee fine sand, 0 to 6 percent slopes

Setting
Landform: Ridges and knolls on beach ridges and moraines that are on lake plains
Position on the landform: Shoulders, backslopes, and summits

Map Unit Composition
Ottokee and similar components: 95 percent

Similar Components
Tedrow soils

Contrasting Components
Granby soils: 5 percent

Map Unit Interpretive Groups
Land capability classification: 3s
Prime farmland: Farmland of local importance

Soil Properties and Qualities

OTTOKEE
Available water capacity: About 4.9 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 2.0 to 9.0 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 78 inches
Depth to the top of the seasonal high water table: 2.0 to 3.5 feet
Water table kind: Apparent
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Eolian deposits and/or glaciolacustrine deposits
Permeability: Rapid
Potential frost action: Low
Shrink-swell potential: Low
Surface layer texture: Fine sand
Potential for surface runoff: Negligible
Wind erosion hazard: Severe

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Burning may destroy organic matter.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- This soil is well suited to use as a site for local roads and streets.

Component Interpretive Groups

OTTOKEE
Pasture and hayland suitability group: B-1
Hydric soil: No

OzB-Ottokee-Spinks loamy fine sands, 2 to 6 percent slopes

Setting
Landform: Knolls on dunes and beach ridges on lake plains
Position on the landform: Backslopes, shoulders and summits

Map Unit Composition
Ottokee and similar components: 51 percent
Spinks and similar components: 49 percent

Similar Components
Darker colored surface layer
Fine sand or fine sandy loam surface layer
More clay in the subsoil
Slopes of 0 to 2 percent
Somewhat poorly drained soils
Well drained soils without lamellae
Till at 40 to 60 inches

Map Unit Interpretive Groups
Land capability classification: 3s
Prime farmland: Not prime farmland

Soil Properties and Qualities

OTTOKEE
Available water capacity: About 4.7 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 1.8 to 10 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 1.5 to 3.5 feet
Water table kind: Apparent
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Eolian sands over sandy glaciolacustrine deposits
Permeability: Rapid
Potential frost action: Low
Shrink-swell potential: Low
Surface layer texture: Loamy fine sand
Potential for surface runoff: Negligible
Wind erosion hazard: Severe

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- This soil is well suited to use as a site for local roads and streets.

Component Interpretive Groups

OTTOKEE
Pasture and hayland suitability group: B-1
Hydric soil: No

Soil Properties and Qualities

SPINKS
Available water capacity: About 4.6 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 1.8 to 13 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: Greater than 6 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Eolian sands over sandy glaciolacustrine deposits
Permeability: Moderately rapid
Potential frost action: Low
Shrink-swell potential: Low
Surface layer texture: Loamy fine sand
Potential for surface runoff: Negligible
Wind erosion hazard: Severe

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Burning may destroy organic matter.

Building Sites

- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

- This soil is well suited to use as building sites.

Septic Tank Absorption Fields

- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.

Local Roads and Streets

- This soil is well suited to use as a site for local roads and streets.

Component Interpretive Groups

SPINKS
Pasture and hayland suitability group: B-1
Hydric soil: No

Pa-Paulding clay

Setting
Landform: Extensive flats on lake plains

Map Unit Composition
Paulding and similar components: 100 percent

Similar Components
Latty soils

Map Unit Interpretive Groups
Land capability classification: 3w
Prime farmland: Not prime farmland

Soil Properties and Qualities

PAULDING
Available water capacity: About 7.8 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 30 to 50 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: At or near the surface
Water table kind: Apparent
Ponding: Long
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 5.0 percent
Parent material: Lacustrine deposits
Permeability: Very slow
Potential frost action: Moderate
Shrink-swell potential: High
Surface layer texture: Clay
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops is restricted by the very high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- A combination of surface and subsurface drainage helps to remove excess water.
- The movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.

- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Ponding restricts the safe use of roads by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of this soil restricts the use of harvesting equipment and roads during wet periods.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- Burning may destroy organic matter.

Building Sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

PAULDING
Pasture and hayland suitability group: F-7
Hydric soil: Yes

Pt-Pits, quarry

Setting
Landform: Quarries and reefs on lake plains

Map Unit Composition
Pits, quarry and similar components: 100 percent

Map Unit Interpretive Groups
Land capability classification: None assigned
Prime farmland: Not prime farmland

Use and Management Considerations

- Onsite investigation is needed to determine the suitability for specific uses.

Component Interpretive Groups

PITS, QUARRY
Pasture and hayland suitability group: Not rated
Hydric soil: Unranked

RaB-Rawson sandy loam, 2 to 6 percent slopes

Setting
Landform: Beach ridges on outwash plains and stream terraces
Position on the landform: Shoulders, summits, and backslopes

Map Unit Composition
Rawson and similar components: 95 percent

Similar Components
Thicker surface layer and subsoil
Thinner surface layer and subsoil
Haskins soils
Nearly level areas
Fine sandy loam surface layer

Contrasting Components
Mermill soils: 3 percent
Hoytville soils: 2 percent

Map Unit Interpretive Groups
Land capability classification: 2e
Prime farmland: All areas are prime farmland

Soil Properties and Qualities

RAWSON
Available water capacity: About 6.3 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 5.0 to 15 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 2.0 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 3.0 percent
Parent material: Outwash over lacustrine deposits
Permeability: Very slow
Potential frost action: Moderate
Shrink-swell potential: High
Surface layer texture: Sandy loam
Potential for surface runoff: High
Wind erosion hazard: Moderate

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- The rooting depth of crops may be restricted by the high clay content.

Pastureland

- Erosion control is needed when pastures are renovated.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

RAWSON
Pasture and hayland suitability group: F-5
Hydric soil: No

RdB-Rawson loam, 2 to 6 percent slopes

Setting
Landform: Beach ridges on outwash plains and stream terraces
Position on the landform: Shoulders, summits, and backslopes

Map Unit Composition
Rawson and similar components: 95 percent

Similar Components
Haskins soils
Nearly level areas
Sandy loam surface layer

Contrasting Components
Hoytville soils: 3 percent
Mermill soils: 2 percent

Map Unit Interpretive Groups
Land capability classification: 2e
Prime farmland: All areas are prime farmland

Soil Properties and Qualities

RAWSON
Available water capacity: About 7.0 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 8.0 to 16 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 2.0 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Outwash
Permeability: Very slow
Potential frost action: Moderate
Shrink-swell potential: High
Surface layer texture: Loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- The rooting depth of crops may be restricted by the high clay content.

Pastureland

- Erosion control is needed when pastures are renovated.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.

- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

RAWSON
Pasture and hayland suitability group: F-5
Hydric soil: No

ReB-Rawson fine sandy loam, stratified substratum, 2 to 6 percent slopes

Setting
Landform: Outwash plains
Position on the landform: Backslopes, shoulders, and summits

Map Unit Composition
Rawson and similar components: 100 percent

Similar Components
Haskins, stratified substratum

Map Unit Interpretive Groups
Land capability classification: 2e
Prime farmland: All areas are prime farmland

Soil Properties and Qualities

RAWSON
Available water capacity: About 7.1 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 8.0 to 16 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 2.0 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Outwash
Permeability: Slow or moderately slow
Potential frost action: Moderate
Shrink-swell potential: High
Surface layer texture: Fine sandy loam
Potential for surface runoff: High
Wind erosion hazard: Moderate

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- The rooting depth of crops may be restricted by the high clay content.

Pastureland

- Erosion control is needed when pastures are renovated.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Rock fragments in the soil obstruct the use of mechanical planting equipment.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may

require some special design and construction techniques or maintenance.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Component Interpretive Groups

RAWSON
Pasture and hayland suitability group: F-5
Hydric soil: No

RfA-Rimer loamy fine sand, 0 to 2 percent slopes

Setting
Landform: Lake plains
Position on the landform: Shoulders and summits

Map Unit Composition
Rimer and similar components: 95 percent

Similar Components
Dark colored surface layer 9 inches thick or less
Thicker surface layer and subsoil
Less than 20 inches of loamy fine sand or coarser material
Haskins soils

Contrasting Components
Mermill soils: 3 percent
Hoytville soils: 2 percent

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

RIMER
Available water capacity: About 4.4 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 3.0 to 15 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 70 inches
Depth to the top of the seasonal high water table: 0.0 to 0.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Glaciolacustrine deposits over basal till
Permeability: Rapid over very slow
Potential frost action: High
Shrink-swell potential: High
Surface layer texture: Loamy fine sand
Potential for surface runoff: Medium
Wind erosion hazard: Severe

Use and Management Considerations

Cropland

- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- The root system of winter grain crops may be damaged by frost action.
- The rooting depth of crops may be restricted by the high clay content.
- The movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil

structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.
- The effectiveness of subsurface drains may be reduced because the drains can become filled with sand.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland

- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Soil wetness may limit the use of this soil by log trucks.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- Because of the seasonal high water table, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

RIMER
Pasture and hayland suitability group: C-2
Hydric soil: No

RgA-Rimer loamy fine sand, 0 to 3 percent slopes

Setting
Landform: low knolls and ridges on outwash plains, beach ridges, and deltas
Position on the landform: Shoulders and summits

Map Unit Composition
Rimer and similar components: 85 percent

Similar Components
Blount soils

Contrasting Components
Haskins soils: 2 percent

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

RIMER
Available water capacity: About 6.2 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 3.0 to 15 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 1.0 to 2.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Glaciolacustrine deposits over till
Permeability: Rapid over very slow
Potential frost action: High
Shrink-swell potential: High
Surface layer texture: Loamy fine sand
Potential for surface runoff: Medium
Wind erosion hazard: Severe

Use and Management Considerations

Cropland

- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- The root system of winter grain crops may be damaged by frost action.
- The rooting depth of crops may be restricted by the high clay content.
- The movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.
- The effectiveness of subsurface drains may be reduced because the drains can become filled with sand.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Soil wetness may limit the use of this soil by log trucks.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.

Component Interpretive Groups

RIMER
Pasture and hayland suitability group: C-1
Hydric soil: No

RhB-Rimer and Tedrow, till substratum, loamy fine sands, 2 to 6 percent slopes

Setting
Landform: Knolls on lake plains
Position on the landform: Backslopes, summits, and shoulders

Map Unit Composition
Rimer and similar components: 46 percent
Tedrow and similar components: 44 percent

Similar Components
More clay in the subsoil
Moderately well drained soils
Slopes of 0 to 2 percent
Darker colored surface layer
Fine sand, sandy loam, or fine sandy loam
Surface layer
Till at 48 to 60 inches

Contrasting Components
Wauseon soils: 10 percent

Map Unit Interpretive Groups
Land capability classification: 2e
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

RIMER
Available water capacity: About 4.8 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 3.2 to 15 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Sandy glaciolacustrine deposits over basal till
Permeability: Rapid over very slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Loamy fine sand
Potential for surface runoff: Low
Wind erosion hazard: Severe

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- The root system of winter grain crops may be damaged by frost action.
- The movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.
- Subsurface drainage helps to lower the seasonal high water table.
- The effectiveness of subsurface drains may be reduced because the drains can become filled with sand.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.

- The root systems of plants may be damaged by frost action.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Soil wetness may limit the use of this soil by log trucks.
- Burning may destroy organic matter.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.

Component Interpretive Groups

RIMER
Pasture and hayland suitability group: C-1
Hydric soil: No

Soil Properties and Qualities

TEDROW
Available water capacity: About 5.3 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 2.8 to 12 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Sandy glaciolacustrine deposits over basal till
Permeability: Very slow or slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Loamy fine sand
Potential for surface runoff: Low
Wind erosion hazard: Severe

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.

- The movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.
- Subsurface drainage helps to lower the seasonal high water table.
- The effectiveness of subsurface drains may be reduced because the drains can become filled with sand.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Soil wetness may limit the use of this soil by log trucks.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.

Component Interpretive Groups

TEDROW
Pasture and hayland suitability group: C-1
Hydric soil: No

RmA-Rimer loamy fine sand, stratified substratum, 0 to 2 percent slopes

Setting
Landform: Lake plains
Position on the landform: Shoulders and summits

Map Unit Composition
Rimer and similar components: 95 percent

Similar Components
Dark colored surface layer 9 inches thick or less
Thicker surface layer and subsoil
Less than 20 inches of loamy fine sand or coarser material
Haskins fine sandy loam, stratified substratum

Contrasting Components
Mermill loam, stratified substratum soils: 5 percent

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

RIMER
Available water capacity: About 6.6 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 4.0 to 15 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 64 inches
Depth to the top of the seasonal high water table: 0.0 to 0.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Glaciolacustrine deposits over basal till
Permeability: Rapid over very slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Loamy fine sand
Potential for surface runoff: Medium
Wind erosion hazard: Severe

Use and Management Considerations

Cropland

- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- The root system of winter grain crops may be damaged by frost action.
- Subsurface drainage helps to lower the seasonal high water table.
- The effectiveness of subsurface drains may be reduced because the drains can become filled with sand.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Soil wetness may limit the use of this soil by log trucks.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- Because of the seasonal high water table, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.

Component Interpretive Groups

RIMER
Pasture and hayland suitability group: C-1
Hydric soil: No

RoA-Roselms silty clay loam, 0 to 2 percent slopes

Setting
Landform: Lake plains
Position on the landform: Shoulders and summits

Map Unit Composition
Roselms and similar components: 95 percent

Similar Components
Loamy surface layer

Contrasting Components
Paulding soils: 5 percent

Map Unit Interpretive Groups
Land capability classification: 3w
Prime farmland: Not prime farmland

Soil Properties and Qualities

ROSELMS
Available water capacity: About 6.5 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 17 to 26 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 0.0 to 0.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 3.0 percent
Parent material: Lacustrine deposits
Permeability: Very slow
Potential frost action: Moderate
Shrink-swell potential: High
Surface layer texture: Silty clay loam
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops is restricted by the very high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- Burning may destroy organic matter.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- Because of the seasonal high water table, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

ROSELMS
Pasture and hayland suitability group: F-7
Hydric soil: No

RrA-Roselms silty clay, 0 to 2 percent slopes

Landform: slight rises on lake plains
Position on the landform: Summits and shoulders

Map Unit Composition
Roselms and similar components: 95 percent

Contrasting Components
Paulding soils: 5 percent
Loam surface layer:

Map Unit Interpretive Groups
Land capability classification: 3w
Prime farmland: Not prime farmland

Soil Properties and Qualities

ROSELMS
Available water capacity: About 6.5 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 20 to 32 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 3.0 percent
Parent material: Lacustrine deposits
Permeability: Very slow
Potential frost action: Moderate
Shrink-swell potential: High
Surface layer texture: Silty clay
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops is restricted by the very high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The high content of lime in the upper part of the soil may cause a nutrient imbalance in seedlings.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- Burning may destroy organic matter.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

ROSELMS
Pasture and hayland suitability group: F-7
Hydric soil: No

Rs-Ross loam

Setting
Landform: Flood plains

Map Unit Composition
Ross and similar components: 100 percent

Similar Components
Thinner dark colored horizon
Genesee soils
Silt loam surface layer

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: All areas are prime farmland

Soil Properties and Qualities

ROSS
Available water capacity: About 11.6 inches to a depth of 60 inches

Cation-exchange capacity of the surface layer: 12 to 26 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 61 inches
Depth to the top of the seasonal high water table: >3.0
Water table kind: Apparent
Ponding: None
Drainage class: Well drained
Flooding: Occasional
Organic matter content in the surface layer: 3.0 to 5.0 percent
Parent material: Alluvium
Permeability: Moderately slow or moderate
Potential frost action: Moderate
Shrink-swell potential: Low
Surface layer texture: Loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Measures that protect the soil from scouring and minimize the loss of crop residue by floodwaters are needed.
- Small grain crops may be damaged by flooding in winter and spring.

Pastureland

- Forage production can be improved by seeding grass-legume mixtures that are tolerant of flooding.
- Sediment left on forage plants after a flood event may reduce palatability and forage intake by the grazing animal.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Flooding may result in damage to haul roads and increased maintenance costs.
- Flooding restricts the safe use of roads by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building Sites

- Under normal weather conditions, this soil is subject to occasional flooding. The flooding may result in physical damage and costly repairs to buildings. This soil is generally unsuited to homesites. Special design of some structures, such as farm outbuildings, may be needed to prevent damage caused by flooding.

Septic Tank Absorption Fields

- This soil is generally unsuited to septic tank absorption fields. The flooding in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Rapidly moving floodwaters may damage some components of septic systems.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Special design of roads and streets is needed to prevent the structural damage caused by low soil strength.
- Special design of roads and bridges is needed to prevent the damage caused by flooding.

Component Interpretive Groups

ROSS
Pasture and hayland suitability group: A-5
Hydric soil: No

SaE3-St. Clair clay, 18 to 35 percent slopes, severely eroded

Setting
Landform: Lake plains
Position on the landform: Backslopes

Map Unit Composition
St. Clair and similar components: 85 percent

Contrasting Components
Broughton soils: 8 percent

Slopes of 12 to 18 percent: 7 percent

Map Unit Interpretive Groups
Land capability classification: 7e
Prime farmland: Not prime farmland

Soil Properties and Qualities

ST.CLAIR
Available water capacity: About 6.3 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 5.0 to 25 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 2.0 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Wave-planed basal till
Permeability: Very slow or slow
Potential frost action: Moderate
Shrink-swell potential: High
Surface layer texture: Clay
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- The slope may restrict the use of some farm equipment.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during construction of haul roads and log landings.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The slope creates unsafe operating conditions and reduces the operating efficiency of harvesting and mechanical planting equipment.
- Because of the slope, the use of mechanical planting equipment is not practical.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- The slope restricts the use of equipment for preparing this site for planting and seeding.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- Burning may destroy organic matter.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.

- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.
- Because of the slope, designing local roads and streets is difficult.

Component Interpretive Groups

ST. CLAIR
Pasture and hayland suitability group: F-6
Hydric soil: No

SbB2-St. Clair silty clay loam, 2 to 6 percent slopes, moderately eroded

Setting
Landform: Lake plains
Position on the landform: Backslopes, shoulders, and summits

Map Unit Composition
St. Clair and similar components: 100 percent

Similar Components
Slopes of more than 6 percent
Rawson soils
Seward soils
Nappanee soils

Map Unit Interpretive Groups
Land capability classification: 3e
Prime farmland: All areas are prime farmland

Soil Properties and Qualities

ST. CLAIR
Available water capacity: About 6.2 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 5.0 to 25 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 1.5 to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Wave-planed basal till
Permeability: Very slow
Potential frost action: Moderate
Shrink-swell potential: High
Surface layer texture: Silty clay loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Erosion control is needed when pastures are renovated.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.

- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- Burning may destroy organic matter.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

ST. CLAIR
Pasture and hayland suitability group: F-5
Hydric soil: No

SbC2-St. Clair silty clay loam, 6 to 12 percent slopes, moderately eroded

Setting
Landform: Lake plains
Position on the landform: Shoulders and backslopes

Map Unit Composition
St. Clair and similar components: 100 percent

Similar Components
Slopes of more than 12 percent
Rawson soils
Seward soils
Nappanee soils

Map Unit Interpretive Groups
Land capability classification: 4e
Prime farmland: Not prime farmland

Soil Properties and Qualities

ST. CLAIR
Available water capacity: About 6.2 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 5.0 to 25 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 1.5 to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Wave-planed basal till
Permeability: Very slow

Potential frost action: Moderate
Shrink-swell potential: High
Surface layer texture: Silty clay loam
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- Burning may destroy organic matter.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines and seepage of poorly treated effluent is a concern.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.
- Because of the slope, designing local roads and streets is difficult.

Component Interpretive Groups

ST. CLAIR
Pasture and hayland suitability group: F-5
Hydric soil: No

SbD2-St. Clair silty clay loam, 12 to 18 percent slopes, eroded

Setting
Landform: Dissected areas along streams on lake plains
Position on the landform: Shoulders and backslopes

Map Unit Composition
St. Clair and similar components: 90 percent

Similar Components
Fine sandy loam, clay loam, or loam surface layer
Well drained soils
Less clay in the subsoil
Slightly eroded areas
Slopes of 6 to 12 percent
Slopes of 18 to 25 percent
Bedrock at 48 to 60 inches

Contrasting Components
Severely eroded areas with carbonates on the surface: 10 percent

Map Unit Interpretive Groups
Land capability classification: 6e
Prime farmland: Not prime farmland

Soil Properties and Qualities

ST. CLAIR
Available water capacity: About 5.6 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 12 to 28 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 1.5 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Wave planed basal till
Permeability: Very slow or slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silty clay loam
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- Burning may destroy organic matter.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.
- Because of the slope, designing local roads and streets is difficult.

Component Interpretive Groups

ST. CLAIR
Pasture and hayland suitability group: F-5
Hydric soil: No

SbE2-St. Clair silty clay loam, 18 to 25 percent slopes, eroded

Setting
Landform: Dissected areas along streams on lake plains
Position on the landform: Backslopes and shoulders

Map Unit Composition
St. Clair and similar components: 90 percent

Similar Components
Well drained soils
Bedrock at 48 to 60 inches
Slightly eroded areas
Less clay in the subsoil
Slopes of 12 to 18 percent
Slopes of 25 to 35 percent
Clay loam, silt loam, or loam surface layer

Contrasting Components
Severely eroded areas with carbonates on the surface: 5 percent
Slopes of 6 to 12 percent: 5 percent

Map Unit Interpretive Groups
Land capability classification: 7e
Prime farmland: Not prime farmland

Soil Properties and Qualities

ST.CLAIR
Available water capacity: About 5.6 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 12 to 28 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 1.5 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None

Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Wave planed basal till
Permeability: Very slow or slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silty clay loam
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during construction of haul roads and log landings.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The slope creates unsafe operating conditions and reduces the operating efficiency of harvesting and mechanical planting equipment.
- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- The slope restricts the use of equipment for preparing this site for planting and seeding.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- Burning may destroy organic matter.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.
- Because of the slope, designing local roads and streets is difficult.

Component Interpretive Groups

ST. CLAIR
Pasture and hayland suitability group: F-5
Hydric soil: No

ScC3-St. Clair silty clay, 6 to 12 percent slopes, severely eroded

Setting
Landform: Dissected areas along streams on lake plains
Position on the landform: Shoulders and backslopes

Map Unit Composition
St. Clair and similar components: 95 percent

Similar Components
Steeper areas
Rawson soils
Seward soils

Contrasting Components
Moderately eroded areas: 5 percent

Map Unit Interpretive Groups
Land capability classification: 6e
Prime farmland: Not prime farmland

Soil Properties and Qualities

ST. CLAIR
Available water capacity: About 5.9 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 5.0 to 25 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 1.5 to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 1.0 percent
Parent material: Wave-planed basal till
Permeability: Very slow
Potential frost action: Moderate
Shrink-swell potential: High
Surface layer texture: Silty clay
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.

- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of this soil restricts the use of harvesting equipment and roads during wet periods.
- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- Burning may destroy organic matter.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines and seepage of poorly treated effluent is a concern.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.
- Because of the slope, designing local roads and streets is difficult.

Component Interpretive Groups

ST. CLAIR
Pasture and hayland suitability group: F-5
Hydric soil: No

ScD3-St. Clair silty clay, 12 to 18 percent slopes, severely eroded

Setting
Landform: Dissected areas along streams on lake plains
Position on the landform: Backslopes and shoulders

Map Unit Composition
St. Clair and similar components: 95 percent

Similar Components
steeper areas
Rawson soils
Seward soils
Lucas soils

Contrasting Components
Moderately eroded areas: 5 percent

Map Unit Interpretive Groups
Land capability classification: 7e
Prime farmland: Not prime farmland

Soil Properties and Qualities

ST. CLAIR
Available water capacity: About 5.9 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 5.0 to 25 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 1.5 to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 1.0 percent
Parent material: Wave-planed basal till
Permeability: Very slow
Potential frost action: Moderate
Shrink-swell potential: High
Surface layer texture: Silty clay
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during construction of haul roads and log landings.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of this soil restricts the use of harvesting equipment and roads during wet periods.
- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- The slope restricts the use of equipment for preparing this site for planting and seeding.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- Burning may destroy organic matter.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.

- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.
- Because of the slope, designing local roads and streets is difficult.

Component Interpretive Groups

ST. CLAIR
Pasture and hayland suitability group: F-5
Hydric soil: No

ScE3-St. Clair silty clay, 18 to 25 percent slopes, severely eroded

Setting
Landform: Dissected areas along streams on lake plains
Position on the landform: Backslopes

Map Unit Composition
St. Clair and similar components: 95 percent

Similar Component
Nappanee soils

Contrasting Components
Moderately eroded areas: 5 percent

Map Unit Interpretive Groups
Land capability classification: 7e
Prime farmland: Not prime farmland

Soil Properties and Qualities

ST. CLAIR
Available water capacity: About 5.9 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 5.0 to 25 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 1.5 to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 1.0 percent
Parent material: Wave-planed basal till
Permeability: Very slow
Potential frost action: Moderate
Shrink-swell potential: High
Surface layer texture: Silty clay
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during construction of haul roads and log landings.

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- The slope creates unsafe operating conditions and reduces the operating efficiency of harvesting and mechanical planting equipment.
- The stickiness of this soil restricts the use of harvesting equipment and roads during wet periods.
- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- The slope restricts the use of equipment for preparing this site for planting and seeding.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- Burning may destroy organic matter.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.
- Because of the slope, designing local roads and streets is difficult.

Component Interpretive Groups

ST. CLAIR
Pasture and hayland suitability group: F-5
Hydric soil: No

ScF3-St. Clair silty clay, 25 to 45 percent slopes, severely eroded

Setting
Landform: Dissected areas along streams on lake plains
Position on the landform: Backslopes

Map Unit Composition
St. Clair and similar components: 95 percent

Contrasting Components
moderately eroded areas: 5 percent

Map Unit Interpretive Groups
Land capability classification: 7e
Prime farmland: Not prime farmland

Soil Properties and Qualities

ST.CLAIR
Available water capacity: About 6.1 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 5.0 to 25 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 1.5 to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 1.0 percent
Parent material: Wave-planed basal till
Permeability: Very slow
Potential frost action: Moderate
Shrink-swell potential: High
Surface layer texture: Silty clay
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- This soil is generally not recommended for pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during construction of haul roads and log landings.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The slope creates unsafe operating conditions and reduces the operating efficiency of harvesting and mechanical planting equipment.
- The stickiness of this soil restricts the use of harvesting equipment and roads during wet periods.
- Because of the slope, use of equipment to prepare this site for planting and seeding is not practical.
- Because of the slope, the use of mechanical planting equipment is not practical.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- Burning may destroy organic matter.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.

- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.
- Because of the slope, designing local roads and streets is difficult.

Component Interpretive Groups

ST. CLAIR
Pasture and hayland suitability group: F-6
Hydric soil: No

SdB-Seward loamy fine sand, 2 to 6 percent slopes

Setting
Landform: Ridges and knolls on lake plains
Position on the landform: Summits, shoulders, and summits

Map Unit Composition
Seward and similar components: 95 percent

Similar Components
Dark colored surface layer 9 inches thick or less
14 to 20 inches of loamy fine sand or coarser material
Rimer soils
Haskins soils

Contrasting Components
Mermill soils: 3 percent
Hoytville soils: 2 percent

Map Unit Interpretive Groups
Land capability classification: 2e
Prime farmland: Not prime farmland

Soil Properties and Qualities

SEWARD
Available water capacity: About 4.3 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 2.0 to 15 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: >3.0
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 3.0 percent
Parent material: Eolian deposits over glaciolacustrine deposits over basal till
Permeability: Rapid over slow
Potential frost action: Moderate
Shrink-swell potential: High
Surface layer texture: Loamy fine sand
Potential for surface runoff: High
Wind erosion hazard: Severe

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- The rooting depth of crops may be restricted by the high clay content.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland

- Erosion control is needed when pastures are renovated.

- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. Special design of structures is needed to prevent damage caused by wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Component Interpretive Groups

SEWARD
Pasture and hayland suitability group: F-5
Hydric soil: No

SdC-Seward loamy fine sand, 6 to 12 percent slopes

Setting
Landform: Lake plains
Position on the landform: Shoulders and backslopes

Map Unit Composition
Seward and similar components: 100 percent

Similar Components
Dark colored surface layer 9 inches thick or less
14 to 20 inches of loamy fine sand or coarser material
St. Clair
Lucas soils
Less sloping areas

Map Unit Interpretive Groups
Land capability classification: 3e
Prime farmland: Not prime farmland

Soil Properties and Qualities

SEWARD
Available water capacity: About 4.3 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 2.0 to 15 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: >3.0
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 3.0 percent

Parent material: Eolian deposits over glaciolacustrine deposits over basal till
Permeability: Rapid over slow
Potential frost action: Moderate
Shrink-swell potential: High
Surface layer texture: Loamy fine sand
Potential for surface runoff: Very high
Wind erosion hazard: Severe

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- The rooting depth of crops may be restricted by the high clay content.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- The slope may restrict the use of some mechanical planting equipment.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. Special design of structures is needed to prevent damage caused by wetness.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Because of the slope, designing local roads and streets is difficult.

Component Interpretive Groups

SEWARD
Pasture and hayland suitability group: F-5
Hydric soil: No

SdD-Seward loamy fine sand, 12 to 18 percent slopes

Setting
Landform: Lake plains
Position on the landform: Shoulders and backslopes

Map Unit Composition
Seward and similar components: 100 percent

Similar Components
Dark colored surface layer 9 inches thick or less
14 to 20 inches of loamy fine sand or coarser material
St. Clair soils
Lucas soils
Less sloping areas

Map Unit Interpretive Groups
Land capability classification: 4e
Prime farmland: Not prime farmland

Soil Properties and Qualities

SEWARD
Available water capacity: About 4.3 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 2.0 to 15 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: >3.0
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 3.0 percent
Parent material: Eolian deposits over glaciolacustrine deposits over basal till
Permeability: Rapid over slow
Potential frost action: Moderate
Shrink-swell potential: High
Surface layer texture: Loamy fine sand
Potential for surface runoff: Very high
Wind erosion hazard: Severe

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- The rooting depth of crops may be restricted by the high clay content.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during construction of haul roads and log landings.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- The slope may restrict the use of some mechanical planting equipment.
- The slope restricts the use of equipment for preparing this site for planting and seeding.

- A loss of soil productivity may occur following an episode of fire.

Building Sites

- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. Special design of structures is needed to prevent damage caused by wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Because of the slope, designing local roads and streets is difficult.

Component Interpretive Groups

SEWARD
Pasture and hayland suitability group: F-5
Hydric soil: No

SeB-Seward loamy fine sand, stratified substratum, 2 to 6 percent slopes

Setting
Landform: Dissected areas along streams on ridges and knolls on lake plains
Position on the landform: Summits, shoulders, and backslopes

Map Unit Composition
Seward and similar components: 100 percent

Similar Components
Dark colored surface layer 9 inches thick or less
14 to 20 inches of loamy fine sand or coarser material
Haskins, stratified substratum
Rimer, stratified substratum

Map Unit Interpretive Groups
Land capability classification: 2e
Prime farmland: Not prime farmland

Soil Properties and Qualities

SEWARD
Available water capacity: About 6.4 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 2.0 to 15 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 94 inches
Depth to the top of the seasonal high water table: >3.0
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 3.0 percent
Parent material: Eolian deposits over glaciolacustrine deposits over basal till
Permeability: Rapid over slow
Potential frost action: Moderate
Shrink-swell potential: Moderate

Surface layer texture: Loamy fine sand
Potential for surface runoff: Negligible
Wind erosion hazard: Severe

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland

- Erosion control is needed when pastures are renovated.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. Special design of structures is needed to prevent damage caused by wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Component Interpretive Groups

SEWARD
Pasture and hayland suitability group: A-1
Hydric soil: No

SeC-Seward loamy fine sand, stratified substratum, 6 to 12 percent slopes

Setting
Landform: Lake plains
Position on the landform: Shoulders and backslopes

Map Unit Composition
Seward and similar components: 100 percent

Similar Components
Dark colored surface layer 9 inches thick or less
St. Clair soils
Lucas soils
Rimer, stratified substratum
Slopes of more than 12 percent
Slopes of less than 6 percent
14 to 20 inches of loamy fine sand or coarser material

Map Unit Interpretive Groups
Land capability classification: 3e
Prime farmland: Not prime farmland

Soil Properties and Qualities

SEWARD
Available water capacity: About 6.4 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 2.0 to 15 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 94 inches
Depth to the top of the seasonal high water table: >3.0
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 3.0 percent
Parent material: Eolian deposits over glaciolacustrine deposits over basal till
Permeability: Rapid over slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Loamy fine sand
Potential for surface runoff: Very low
Wind erosion hazard: Severe

Use and Management Considerations
Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland

- Erosion control is needed when pastures are renovated.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- The slope may restrict the use of some mechanical planting equipment.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. Special design of structures is needed to prevent damage caused by wetness.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Because of the slope, designing local roads and streets is difficult.

Component Interpretive Groups

SEWARD
Pasture and hayland suitability group: A-1
Hydric soil: No

SfA-Shinrock silt loam, sandy subsoil variant, 0 to 2 percent slopes

Setting
Landform: Flats on lake plains
Position on the landform: Shoulders and summits

Map Unit Composition
Shinrock Variant and similar components: 95 percent

Similar Components
Del Rey soils
Digby soils

Contrasting Components
Dark colored, very poorly drained soils: 5 percent

Map Unit Interpretive Groups
Land capability classification: 2s
Prime farmland: All areas are prime farmland

Soil Properties and Qualities

SHINROCK
Available water capacity: About 6.7 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 8.0 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 82 inches
Depth to the top of the seasonal high water table: 1.5 to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Lacustrine deposits
Permeability: Slow or moderately slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- The root systems of plants may be damaged by frost action.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

SHINROCK
Pasture and hayland suitability group: A-6
Hydric soil: No

Sh-Shoals silt loam

Setting
Landform: Flood plains

Map Unit Composition
Shoals and similar components: 95 percent

Similar Components
Genesee soils
Silty clay loam surface layer

Contrasting Components
Sloan soils: 5 percent

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season

Soil Properties and Qualities

SHOALS
Available water capacity: About 9.7 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 12 to 27 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.0 feet
Water table kind: Apparent
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: Frequent
Organic matter content in the surface layer: 2.0 to 5.0 percent
Parent material: Alluvium
Permeability: Moderately slow or moderate
Potential frost action: High
Shrink-swell potential: Low
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Controlling traffic can minimize soil compaction.
- Winter grain crops are commonly not grown because of frequent flooding.

- Measures that protect the soil from scouring and minimize the loss of crop residue by floodwaters are needed.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

- Forage production can be improved by seeding grass-legume mixtures that are tolerant of flooding.
- Sediment left on forage plants after a flood event may reduce palatability and forage intake by the grazing animal.
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Flooding may result in damage to haul roads and increased maintenance costs.
- Soil wetness may limit the use of this soil by log trucks.
- Flooding restricts the safe use of roads by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- Burning may destroy organic matter.

Building Sites

- The frequent flooding in areas of this soil greatly increases the risk of damage associated with floodwaters. Because of the flooding, this soil is generally unsuited to building site development.

Septic Tank Absorption Fields

- This soil is generally unsuited to septic tank absorption fields. The flooding in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Rapidly moving floodwaters may damage some components of septic systems.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- Special design of roads and bridges is needed to prevent the damage caused by flooding.

Component Interpretive Groups

SHOALS
Pasture and hayland suitability group: C-3
Hydric soil: No

Sm-Sloan silty clay loam, 0 to 1 percent slopes, frequently flooded

Setting
Landform: Backswamps and flats on flood plains

Map Unit Composition
Sloan and similar components: 90 percent

Similar Components
Surface layer less than 10 inches thick
More clay in the subsoil
Silt loam or clay loam surface layer
Till at 40 to 60 inches
Bedrock at 48 to 60 inches

Contrasting Components
Eel soils: 5 percent
Shoals soils: 5 percent

Map Unit Interpretive Groups
Land capability classification: 3w
Prime farmland: Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season

Soil Properties and Qualities

SLOAN
Available water capacity: About 10.1 inches to a depth of 60 inches

Cation-exchange capacity of the surface layer: 17 to 33 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 0.0 to 1.0 feet
Water table kind: Apparent
Ponding: Brief
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding duration: Frequent
Organic matter content in the surface layer: 3.0 to 6.0 percent
Parent material: Loamy alluvium
Permeability: Moderately slow or moderate
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silty clay loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Winter grain crops are commonly not grown because of frequent flooding.
- Measures that protect the soil from scouring and minimize the loss of crop residue by floodwaters are needed.
- A combination of surface and subsurface drainage helps to remove excess water.

Pastureland

- Forage production can be improved by seeding grass-legume mixtures that are tolerant of flooding.
- Sediment left on forage plants after a flood event may reduce palatability and forage intake by the grazing animal.
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Flooding may result in damage to haul roads and increased maintenance costs.
- Soil wetness may limit the use of this soil by log trucks.
- Flooding restricts the safe use of roads by log trucks.
- Ponding restricts the safe use of roads by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- The frequent flooding in areas of this soil greatly increases the risk of damage associated with floodwaters. Because of the flooding, this soil is generally unsuited to building site development.
- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.

Septic Tank Absorption Fields
- This soil is generally unsuited to septic tank absorption fields. The flooding in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Rapidly moving floodwaters may damage some components of septic systems.

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.
- Special design of roads and bridges is needed to prevent the damage caused by flooding.

Component Interpretive Groups

SLOAN
Pasture and hayland suitability group: C-3
Hydric soil: Yes

Sn-Sloan loam, occasionally flooded

Setting
Landform: Flood plains

Map Unit Composition
Sloan and similar components: 80 percent

Contrasting Components
More clay in the surface layer and subsoil: 7 percent
Shoals soils: 7 percent
Eel soils: 6 percent

Map Unit Interpretive Groups
Land capability classification: 3w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

SLOAN
Available water capacity: About 10.5 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 13 to 26 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 67 inches
Depth to the top of the seasonal high water table: 0.0 to 0.5 feet
Water table kind: Apparent
Ponding: None
Drainage class: Very poorly drained
Flooding duration: Occasional
Organic matter content in the surface layer: 3.0 to 6.0 percent
Parent material: Alluvium
Permeability: Moderately slow or moderate
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland
- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Measures that protect the soil from scouring and minimize the loss of crop residue by floodwaters are needed.
- Small grain crops may be damaged by flooding in winter and spring.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

- Forage production can be improved by seeding grass-legume mixtures that are tolerant of flooding.
- Sediment left on forage plants after a flood event may reduce palatability and forage intake by the grazing animal.
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.

- Flooding may result in damage to haul roads and increased maintenance costs.
- Soil wetness may limit the use of this soil by log trucks.
- Flooding restricts the safe use of roads by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building Sites

- Under normal weather conditions, this soil is subject to occasional flooding. The flooding may result in physical damage and costly repairs to buildings. This soil is generally unsuited to homesites. Special design of some structures, such as farm outbuildings, may be needed to prevent damage caused by flooding.

Septic Tank Absorption Fields

- This soil is generally unsuited to septic tank absorption fields. The flooding in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Rapidly moving floodwaters may damage some components of septic systems.
- Because of the seasonal high water table, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.
- Special design of roads and bridges is needed to prevent the damage caused by flooding.

Component Interpretive Groups

SLOAN
Pasture and hayland suitability group: C-3
Hydric soil: Yes

So-Sloan silty clay loam

Setting
Landform: Flood plains

Map Unit Composition
Sloan and similar components: 90 percent

Similar Components
Silt loam surface layer
Calcareous within 20 inches

Contrasting Components
Shoals soils: 4 percent
Medway: 3 percent
Ross soils: 3 percent

Map Unit Interpretive Groups
Land capability classification: 3w
Prime farmland: Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season

Soil Properties and Qualities

SLOAN
Available water capacity: About 10.6 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 19 to 29 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 72 inches
Depth to the top of the seasonal high water table: 0.0 to 1.0 feet
Water table kind: Apparent
Ponding: None
Drainage class: Very poorly drained
Flooding: Frequent
Organic matter content in the surface layer: 3.0 to 6.0 percent
Parent material: Alluvium
Permeability: Moderately slow or moderate
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silty clay loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Winter grain crops are commonly not grown because of frequent flooding.
- Measures that protect the soil from scouring and minimize the loss of crop residue by floodwaters are needed.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

- Forage production can be improved by seeding grass-legume mixtures that are tolerant of flooding.
- Sediment left on forage plants after a flood event may reduce palatability and forage intake by the grazing animal.
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Flooding may result in damage to haul roads and increased maintenance costs.
- Soil wetness may limit the use of this soil by log trucks.
- Flooding restricts the safe use of roads by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- The frequent flooding in areas of this soil greatly increases the risk of damage associated with floodwaters. Because of the flooding, this soil is generally unsuited to building site development.

Septic Tank Absorption Fields

- This soil is generally unsuited to septic tank absorption fields. The flooding in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Rapidly moving floodwaters may damage some components of septic systems.
- Because of the seasonal high water table, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.
- Special design of roads and bridges is needed to prevent the damage caused by flooding.

Component Interpretive Groups

SLOAN
Pasture and hayland suitability group: C-3
Hydric soil: Yes

SpB-Spinks fine sand, 2 to 6 percent slopes

Setting
Landform: Dunes and beach ridges
Position on the landform: Summits, backslopes, and shoulders

Map Unit Composition
Spinks and similar components: 100 percent

Similar Components
Oakville soils
Tedrow soils
Ottokee soils

Map Unit Interpretive Groups
Land capability classification: 3s
Prime farmland: Not prime farmland

Soil Properties and Qualities

SPINKS
Available water capacity: About 2.6 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 2.0 to 5.0 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 153 inches
Depth to the top of the seasonal high water table: Greater than 6 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 4.0 percent
Parent material: Eolian deposits
Permeability: Moderately rapid or rapid in the upper part of the solum, and moderately rapid in the lower part of the solum
Potential frost action: Low
Shrink-swell potential: Low
Surface layer texture: Fine sand
Potential for surface runoff: Negligible
Wind erosion hazard: Severe

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- The limited available water capacity inhibits root development and increases the seedling mortality rate.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- This soil is well suited to use as building sites.

Septic Tank Absorption Fields

- This soil is well suited to use as a site for septic tank absorption fields.

Local Roads and Streets

- This soil is well suited to use as a site for local roads and streets.

Component Interpretive Groups

SPINKS
Pasture and hayland suitability group: B-1
Hydric soil: No

SpC-Spinks fine sand, 6 to 12 percent slopes

Setting
Landform: Dunes and beach ridges
Position on the landform: Summits, shoulders, and backslopes

Map Unit Composition
Spinks and similar components: 100 percent

Similar Components
Tedrow soils
Ottokee soils
Gently sloping areas

Map Unit Interpretive Groups
Land capability classification: 3e
Prime farmland: Not prime farmland

Soil Properties and Qualities

SPINKS
Available water capacity: About 2.6 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 2.0 to 5.0 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 153 inches
Depth to the top of the seasonal high water table: Greater than 6 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 4.0 percent
Parent material: Eolian deposits
Permeability: Moderately rapid or rapid in the upper part of the solum, and moderately rapid in the lower part of the solum
Potential frost action: Low
Shrink-swell potential: Low
Surface layer texture: Fine sand
Potential for surface runoff: Very low
Wind erosion hazard: Severe

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- The limited available water capacity inhibits root development and increases the seedling mortality rate.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- The slope may restrict the use of some mechanical planting equipment.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.

- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- Because of the slope, special design and installation techniques are needed for the effluent distribution lines and seepage of poorly treated effluent is a concern.

Local Roads and Streets

- Because of the slope, designing local roads and streets is difficult.

Component Interpretive Groups

SPINKS
Pasture and hayland suitability group: B-1
Hydric soil: No

SpD-Spinks fine sand, 12 to 18 percent slopes

Setting
Landform: Dunes and beach ridges
Position on the landform: Summits, shoulders, and backslopes

Map Unit Composition
Spinks and similar components: 100 percent

Similar Components
Less sloping areas

Map Unit Interpretive Groups
Land capability classification: 4e
Prime farmland: Not prime farmland

Soil Properties and Qualities

SPINKS
Available water capacity: About 2.6 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 2.0 to 5.0 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 153 inches
Depth to the top of the seasonal high water table: Greater than 6 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 4.0 percent
Parent material: Eolian deposits
Permeability: Moderately rapid or rapid in the upper part of the solum, and moderately rapid in the lower part of the solum
Potential frost action: Low
Shrink-swell potential: Low
Surface layer texture: Fine sand
Potential for surface runoff: Very low
Wind erosion hazard: Severe

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during construction of haul roads and log landings.

- The limited available water capacity inhibits root development and increases the seedling mortality rate.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- The slope may restrict the use of some mechanical planting equipment.
- The slope restricts the use of equipment for preparing this site for planting and seeding.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.

Local Roads and Streets

- Because of the slope, designing local roads and streets is difficult.

Component Interpretive Groups

SPINKS
Pasture and hayland suitability group: B-1
Hydric soil: No

TdA-Tedrow loamy fine sand, 0 to 2 percent slopes

Setting
Landform: Rises on lake plains
Position on the landform: Summits and shoulders

Map Unit Composition
Tedrow and similar components: 95 percent

Similar Components
Ottokee soils
Calcareous at shallower depths
Darker colored surface layer
Rimer, stratified substratum

Contrasting Components
Granby soils: 5 percent

Map Unit Interpretive Groups
Land capability classification: 3s
Prime farmland: Not prime farmland

Soil Properties and Qualities

TEDROW
Available water capacity: About 3.4 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 5.0 to 14 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.0 feet
Water table kind: Apparent
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Glaciolacustrine deposits over eolian deposits
Permeability: Rapid
Potential frost action: Moderate
Shrink-swell potential: Low
Surface layer texture: Loamy fine sand
Potential for surface runoff: Negligible
Wind erosion hazard: Severe

Use and Management Considerations

Cropland

- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.

- Subsurface drainage helps to lower the seasonal high water table.
- The effectiveness of subsurface drains may be reduced because the drains can become filled with sand.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland

- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Soil wetness may limit the use of this soil by log trucks.
- Burning may destroy organic matter.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.

Component Interpretive Groups

TEDROW
Pasture and hayland suitability group: C-1
Hydric soil: No

TeA-Tedrow loamy fine sand, silty subsoil variant, 0 to 2 percent slopes

Setting
Landform: Rises on lake plains
Position on the landform: Summits and shoulders

Map Unit Composition
Tedrow Variant and similar components: 95 percent

Similar Components
Kibbie soils

Contrasting Components
Colwood soils: 5 percent

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: Not prime farmland

Soil Properties and Qualities

TEDROW
Available water capacity: About 5.2 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 5.0 to 14 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 50 inches
Depth to the top of the seasonal high water table: 0.5 to 1.0 feet
Water table kind: Apparent

Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Glaciolacustrine deposits over eolian deposits
Permeability: Moderately slow or moderate
Potential frost action: Moderate
Shrink-swell potential: Low
Surface layer texture: Loamy fine sand
Potential for surface runoff: Low
Wind erosion hazard: Severe

Use and Management Considerations

Cropland

- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Subsurface drainage helps to lower the seasonal high water table.
- The effectiveness of subsurface drains may be reduced because the drains can become filled with sand.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland

- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Soil wetness may limit the use of this soil by log trucks.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.

Component Interpretive Groups

TEDROW
Pasture and hayland suitability group: C-1
Hydric soil: No

To-Toledo silty clay loam

Setting
Landform: Flats on lake plains

Map Unit Composition
Toledo and similar components: 95 percent

Similar Components
Hoytville soils
Silty clay surface layer

Contrasting Components
Fulton soils: 5 percent

Map Unit Interpretive Groups
Land capability classification: 3w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

TOLEDO
Available water capacity: About 6.3 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 22 to 36 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 68 inches
Depth to the top of the seasonal high water table: 0.0 to 1.0 feet
Water table kind: Apparent
Ponding: Long
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 6.0 percent
Parent material: Lacustrine deposits
Permeability: Slow
Potential frost action: Moderate
Shrink-swell potential: High
Surface layer texture: Silty clay loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- A combination of surface and subsurface drainage helps to remove excess water.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Ponding restricts the safe use of roads by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Burning may destroy organic matter.

Building Sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.

- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

TOLEDO
Pasture and hayland suitability group: C-2
Hydric soil: Yes

Tt-Toledo silty clay

Setting
Landform: Flats on lake plains

Map Unit Composition
Toledo and similar components: 95 percent

Similar Components
Hoytville soils
Silty clay loam surface layer

Contrasting Components
Fulton soils: 5 percent

Map Unit Interpretive Groups
Land capability classification: 3w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

TOLEDO
Available water capacity: About 6.0 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 26 to 40 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 68 inches
Depth to the top of the seasonal high water table: 0.0 to 1.0 feet
Water table kind: Apparent
Ponding: Long
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 6.0 percent
Parent material: Lacustrine deposits
Permeability: Slow
Potential frost action: Moderate
Shrink-swell potential: High
Surface layer texture: Silty clay
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- A combination of surface and subsurface drainage helps to remove excess water.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Ponding restricts the safe use of roads by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Burning may destroy organic matter.

Building Sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

TOLEDO
Pasture and hayland suitability group: C-2
Hydric soil: Yes

TuB2-Tuscola loam, 2 to 6 percent slopes, moderately eroded

Setting
Landform: Lake plains
Position on the landform: Backslopes and shoulders

Map Unit Composition
Tuscola and similar components: 100 percent

Similar Components
Lucas soils
Kibbie soils
Steeper areas

Map Unit Interpretive Groups
Land capability classification: 2e
Prime farmland: All areas are prime farmland

Soil Properties and Qualities

TUSCOLA
Available water capacity: About 8.5 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 4.0 to 15 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 68 inches
Depth to the top of the seasonal high water table: 2.0 to 3.0 feet
Water table kind: Apparent
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 2.0 percent
Parent material: Glaciolacustrine deposits
Permeability: Moderately slow or moderate
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Erosion control is needed when pastures are renovated.
- The root systems of plants may be damaged by frost action.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- Burning may destroy organic matter.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Special design of roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

TUSCOLA
Pasture and hayland suitability group: A-6
Hydric soil: No

TuC2-Tuscola loam, 6 to 12 percent slopes, moderately eroded

Setting
Landform: Lake plains
Position on the landform: Backslopes and shoulders

Map Unit Composition
Tuscola and similar components: 100 percent

Similar Components
Slopes of more than 12 percent
Slightly eroded areas
St. Clair soils
Lucas soils

Map Unit Interpretive Groups
Land capability classification: 3e
Prime farmland: Not prime farmland

Soil Properties and Qualities

TUSCOLA
Available water capacity: About 8.5 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 4.0 to 15 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 68 inches
Depth to the top of the seasonal high water table: 2.0 to 3.0 feet
Water table kind: Apparent
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 2.0 percent
Parent material: Glaciolacustrine deposits
Permeability: Moderately slow or moderate
Potential frost action: High
Shrink-swell potential: Low
Surface layer texture: Loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- The root systems of plants may be damaged by frost action.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The slope may restrict the use of some mechanical planting equipment.
- Burning may destroy organic matter.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines and seepage of poorly treated effluent is a concern.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic

systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Special design of roads and streets is needed to prevent the structural damage caused by low soil strength.
- Because of the slope, designing local roads and streets is difficult.

Component Interpretive Groups

TUSCOLA
Pasture and hayland suitability group: A-6
Hydric soil: No

Ud-Udorthents, rolling

Setting
Landform: Fill and Borrow pits

Map Unit Composition
Udorthents and similar components: 95 percent

Contrasting Components
Areas partially covered with bricks, glass, concrete chunks: 2 percent
Sanitary landfills that haven't been covered: 2 percent
More clay or sand throughout the soil: 1 percent

Map Unit Interpretive Groups
Land capability classification: None assigned
Prime farmland: Not prime farmland

Use and Management Considerations

- Onsite investigation is needed to determine the suitability for specific uses.

Component Interpretive Groups

UDORTHENTS
Pasture and hayland suitability group: Not rated
Hydric soil: Unranked

Ur-Urban land

Setting
Landform: None assigned

Map Unit Composition
Urban land and similar components: 100 percent

Map Unit Interpretive Groups
Land capability classification: None assigned
Prime farmland: Not prime farmland

Use and Management Considerations

- Onsite investigation is needed to determine the suitability for specific uses.

Component Interpretive Groups

URBAN LAND
Pasture and hayland suitability group: Not rated
Hydric soil: Unranked

VaA-Vaughnsville loam, 0 to 2 percent slopes

Setting
Landform: Beach ridges
Position on the landform: Shoulders and summits

Map Unit Composition
Vaughnsville and similar components: 100 percent

Similar Components
Rawson soils
Haskins soils

Map Unit Interpretive Groups
Land capability classification: 2w
Prime farmland: All areas are prime farmland

Soil Properties and Qualities

VAUGNSVILLE
Available water capacity: About 7.2 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 10 to 22 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 2.0 to 3.0 feet

Water table kind: Apparent
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Eolian deposits over glaciolacustrine deposits
Permeability: Slow
Potential frost action: High
Shrink-swell potential: High
Surface layer texture: Loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.

Pastureland

- The root systems of plants may be damaged by frost action.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Component Interpretive Groups

VAUGHNSVILLE
Pasture and hayland suitability group: A-6
Hydric soil: No

W-Water

Setting
This map unit consists of areas inundated with water for most of the year

Map Unit Composition
This map unit generally includes rivers, lakes, and ponds.

Use and Management Considerations

No interpretations are given for this map unit.

Wa-Wabasha silty clay

Setting
Landform: Flood plains

Map Unit Composition
Wabasha and similar components: 95 percent

Similar Components
Sloan soils
Silty clay loam surface layer

Contrasting Components
Shoals soils: 5 percent

Map Unit Interpretive Groups
Land capability classification: 3w
Prime farmland: Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season

Soil Properties and Qualities

WABASHA
Available water capacity: About 9.7 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 22 to 39 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 70 inches
Depth to the top of the seasonal high water table: 0.0 to 1.0 feet
Water table kind: Apparent
Ponding: None
Drainage class: Very poorly drained
Flooding: Frequent
Organic matter content in the surface layer: 3.0 to 6.0 percent
Parent material: Alluvium
Permeability: Slow
Potential frost action: High
Shrink-swell potential: High
Surface layer texture: Silty clay
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Winter grain crops are commonly not grown because of frequent flooding.
- Measures that protect the soil from scouring and minimize the loss of crop residue by floodwaters are needed.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Forage production can be improved by seeding grass-legume mixtures that are tolerant of flooding.
- Sediment left on forage plants after a flood event may reduce palatability and forage intake by the grazing animal.
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Flooding may result in damage to haul roads and increased maintenance costs.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Flooding restricts the safe use of roads by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the

soil may create unsafe conditions for log trucks.
- The stickiness of this soil restricts the use of harvesting equipment and roads during wet periods.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- The frequent flooding in areas of this soil greatly increases the risk of damage associated with floodwaters. Because of the flooding, this soil is generally unsuited to building site development.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- This soil is generally unsuited to septic tank absorption fields. The flooding in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Rapidly moving floodwaters may damage some components of septic systems.
- Because of the seasonal high water table, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.
- Special design of roads and bridges is needed to prevent the damage caused by flooding.

Component Interpretive Groups

WABASHA
Pasture and hayland suitability group: C-3
Hydric soil: Yes

Wc-Warners muck

Setting
Landform: Swamps

Map Unit Composition
Warners and similar components: 95 percent

Similar Components
Exposed marl
Adrian soils
Granby soils

Contrasting Components
Tedrow soils: 5 percent

Map Unit Interpretive Groups
Land capability classification: 3w
Prime farmland: Not prime farmland

Soil Properties and Qualities

WARNERS
Available water capacity: About 6.8 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 24 to 45 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 50 inches
Depth to the top of the seasonal high water table: 0.0 to 0.5 feet
Water table kind: Apparent
Ponding: None
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 10.0 to 15.0 percent
Parent material: Organic material
Permeability: Slow
Potential frost action: High
Shrink-swell potential: Low
Surface layer texture: Muck
Potential for surface runoff: Negligible
Wind erosion hazard: Severe

Use and Management Considerations

Cropland

- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The high pH in the soil may cause a nutrient imbalance in seedlings.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- The engineering properties of this soil are generally unfavorable for supporting heavy loads. Special design of footings and foundations may be needed to prevent the structural damage caused by low soil strength.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

- Because of the seasonal high water table, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.

Component Interpretive Groups

WARNERS
Pasture and hayland suitability group: D-1
Hydric soil: Yes

Wf-Wauseon fine sandy loam

Setting
Landform: Flats on lake plains

Map Unit Composition
Wauseon and similar components: 95 percent

Contrasting Components
Rimer soils: 5 percent

Map Unit Interpretive Groups
Land capability classification: 3w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

WAUSEON
Available water capacity: About 6.4 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 11 to 22 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches

Depth to the top of the seasonal high water table: 0.0 to 1.0 feet
Water table kind: Perched
Ponding: Long
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 4.0 to 8.0 percent
Parent material: Glaciolacustrine deposits over basal till
Permeability: Slow
Potential frost action: High
Shrink-swell potential: High
Surface layer texture: Fine sandy loam
Potential for surface runoff: Medium
Wind erosion hazard: Moderate

Use and Management Considerations

Cropland

- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- The root system of winter grain crops may be damaged by frost action.
- The rooting depth of crops may be restricted by the high clay content.
- A combination of surface and subsurface drainage helps to remove excess water.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Soil wetness may limit the use of this soil by log trucks.
- Ponding restricts the safe use of roads by log trucks.

Building Sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Component Interpretive Groups

WAUSEON
Pasture and hayland suitability group: C-1
Hydric soil: Yes

Wg-Wauseon loamy fine sand, stratified substratum

Setting
Landform: Flats on lake plains

Map Unit Composition
Wauseon and similar components: 95 percent

Contrasting Components
Rimer, stratified substratum soils: 5 percent

Map Unit Interpretive Groups
Land capability classification: 3w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

WAUSEON
Available water capacity: About 9.2 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 11 to 22 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 60 inches
Depth to the top of the seasonal high water table: 0.0 to 1.0 feet
Water table kind: Perched
Ponding: Long
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 4.0 to 8.0 percent
Parent material: Glaciolacustrine deposits over basal till
Permeability: Moderately slow or moderate
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Loamy fine sand
Potential for surface runoff: Very low
Wind erosion hazard: Severe

Use and Management Considerations

Cropland

- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- The root system of winter grain crops may be damaged by frost action.
- A combination of surface and subsurface drainage helps to remove excess water.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Soil wetness may limit the use of this soil by log trucks.
- Ponding restricts the safe use of roads by log trucks.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Component Interpretive Groups

WAUSEON
Pasture and hayland suitability group: C-1
Hydric soil: Yes

Important Farmland

Prime Farmland

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

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, woodland, or other land, but it is not urban or built-up land or water areas. The soil qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

Most of the total acreage in the county, meets the soils requirements for prime farmland as defined by the Natural Resources Conservation Service. Henry County consists of dominantly prime farmland soils, however, small areas of soils not meeting the requirements are scattered throughout the county.

Most of the prime farmland in the county is used as cropland. Urbanization in and around cities and along interstate corridors account for the majority of prime farmland lost to agricultural uses.

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

The map units in the survey area that are considered prime farmland are listed in table 5 (p. 284). These lists do not constitute a recommendation for a particular land use. On some soils included in the lists, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures. The extent of each listed map unit is shown in table 4 (p. 282). The location is shown on the detailed soil maps. The soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."

Unique Farmland

Unique farmland is land other than prime farmland that is used for the production of specific high–value food and fiber crops. It has the special combination of soil qualities, location, growing season, and moisture supply needed for the economic production of sustained high yields of a specific high–quality crop when treated and managed by acceptable farming methods. Examples of such crops are tree fruits, berries, and vegetables.

Unique farmland has an adequate supply of available moisture for the specific crops for which it is used because of stored moisture, precipitation, or irrigation and has a combination of soil qualities, growing season, temperature, humidity, air drainage, elevation, aspect, and other factors, such as nearness to markets, that favors the production of a specific food or fiber crop.

Lists of unique farmland are developed as needed in cooperation with conservation districts and others.

Additional Farmland of Statewide Importance

Some areas other than areas of prime farmland and unique farmland are of statewide importance in the production of food, feed, fiber, forage, and oilseed crops. The criteria used in defining and delineating these areas are determined by the appropriate state agency or agencies. Generally, additional farmland of statewide importance includes areas that nearly meet the criteria for prime farmland and that economically produce high yields of crops when treated and managed by acceptable farming methods. Some areas can produce as high a yield as areas of prime farmland if conditions are favorable. In some states additional farmland of statewide importance may include tracts of land that have been designated for agriculture by state law.

Additional Farmland of Local Importance

This land consists of areas that are of local importance in the production of food, feed, fiber, forage, and oilseed crops and are not identified as having national or statewide importance. Where appropriate, this land is identified by local agencies. It may include tracts of land that have been designated for agriculture by local ordinance.

Lists of this land are developed as needed in cooperation with conservation districts and others.

Hydric Soils

In this section, hydric soils are defined and described and the hydric soils in the survey area are listed in table 6 (p. 286).

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin and others, 1979; U.S. Army Corps of Engineers, 1987; National Research Council, 1995; Tiner, 1985). Criteria for each of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). These soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 1995). These criteria are used to identify a phase of a soil series that normally is associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 1998) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils in this survey area are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and others, 1998).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

The map units in table 6 (p. 286) meet the definition of hydric soils and, in addition, have at least one of the hydric soil indicators. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site (National Research Council, 1995; Hurt and others, 1998).

Figure 4. This wetland was restored on a Sloan series a hydric soil.

Map units that are made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

The map units, in table 7 (p. 287), in general, do not meet the definition of hydric soils because they do not have one of the hydric soil indicators. A portion of these map units, however, may include hydric soils. Onsite investigation is recommended to determine whether hydric soils occur and the location of the included hydric soils.

Soil Quality

Prepared by Natural Resources Conservation Service, Soil Quality Institute, Ames, Iowa.

SOIL QUALITY is how well soil does what we want it to do. More specifically, soil quality is the capacity of a specific kind of soil to function, within natural or managed ecosystem boundaries, to sustain plant and animal productivity, maintain or enhance water and air quality, and support human health and habitation.

Example of a quality soil.

People have different ideas of what a quality soil is. For example: for people active in production agriculture, it may mean highly productive land, sustaining or enhancing productivity, maximizing profits, or maintaining the soil resource for future generations; for consumers, it may mean plentiful, healthful, and inexpensive food for present and future generations; for naturalists, it may mean soil in harmony with the landscape and its surroundings; for the environmentalist, it may mean soil functioning at its potential in an ecosystem with respect to maintenance or enhancement of biodiversity, water quality, nutrient cycling, and biomass production.

What Does Soil Do?

Healthy soil gives us clean air and water, bountiful crops and forests, productive rangeland, diverse wildlife, and beautiful landscapes. Soil does all this by performing five essential functions:

- Regulating water. Soil helps control where rain, snowmelt, and irrigation water goes. Water and dissolved solutes flow over the land or into and through the soil.
- Sustaining plant and animal life. The diversity and productivity of living things depends on soil.
- Filtering potential pollutants. The minerals and microbes in soil are responsible for filtering, buffering, degrading, immobilizing, and detoxifying organic and inorganic materials, including industrial and municipal by-products and atmospheric deposits.
- Cycling nutrients. Carbon, nitrogen, phosphorus, and many other nutrients are stored, transformed, and cycled through soil.
- Supporting structures. Buildings need stable soil for support, and archeological treasures associated with human habitation are protected in soils.

Here are some examples of indicators of soil quality:

Indicator	Relationship to Soil Health
Soil organic matter (SOM)	Soil fertility, structure, stability, nutrient retention; soil erosion.
PHYSICAL: Soil structure, depth of soil, Infiltration and bulk density; water holding capacity	Retention and transport of water and nutrients; habitat for microbes; estimate of crop productivity potential; compaction, plow pan, water movement; porosity; workability.
CHEMICAL: pH; electrical conductivity; extractable N-P-K	Biological and chemical activity thresholds; plant and microbial activity thresholds; plant available nutrients and potential for N and P loss.
BIOLOGICAL: Microbial biomass C and N; potentially mineralizable N; soil respiration.	Microbial catalytic potential and repository for C and N; soil productivity and N supplying potential; microbial activity measure

Soil Has Both Inherent and Dynamic Quality.

Inherent soil quality is a soil's natural ability to function. For example, sandy soils drain faster than clayey soils. Deep soils will have more room for roots than soils with bedrock near the surface. These characteristics do not change easily.

Dynamic soil quality is how soil changes depending on how it is managed. Management choices affect the amount of soil organic matter, soil structure, soil depth, water and nutrient holding capacity. One goal of soil quality research is to learn how to manage soil in a way that improves soil function. Soils respond differently to management depending on the inherent properties of the soil and the surrounding landscape.

Soil Quality is Linked to Sustainability.

Understanding soil quality means assessing and managing soil so that it functions optimally now and is not degraded for future use. By monitoring changes in soil quality, a land manager can determine if a set of practices are sustainable.

Assessing Soil Quality

Soil quality is an assessment of how well soil performs all of its functions. It cannot be determined by measuring only crop yield, water quality, or any other single outcome. The quality of a soil is an assessment of how it performs all of its functions now and how those functions are being preserved for future use.

Soil quality cannot be measured directly, so we evaluate indicators. Indicators are measurable properties of soil or plants that provide clues about how well the soil can function. Indicators can be physical, chemical, and biological characteristics.

Useful indicators:

- are easy to measure
- measure changes in soil functions
- encompass chemical, biological, and physical properties
- are accessible to many users and applicable to field conditions
- are sensitive to variations in climate and management.

Indicators can be assessed by qualitative or quantitative techniques. After measurements are collected, they can be evaluated by looking for patterns and comparing results to measurements taken at a different time or field.

Soil Quality is Not an End in Itself.

The ultimate purpose of researching and assessing soil quality is not to achieve high aggregate stability, biological activity, or some other soil property. The purpose is to protect and improve long-term agricultural productivity, water quality, and habitats of all organisms including people. We use soil characteristics as indicators of soil quality, but in the end, soil quality must be identified by how it performs its functions.

Managing for Soil Quality

Each combination of soil type and land use calls for a different set of practices to enhance soil quality. Yet, several principles apply in most situations.

1. Add organic matter. Regular additions of organic matter are linked to many aspects of soil quality. Organic matter may come from crop residues at the surface, roots of cover crops, animal manure, green manure, compost, and others. Organic matter, and the organisms that eat it, can improve water holding capacity, nutrient availability, and can help protect against erosion.

2. Avoid excessive tillage. Tillage has positive effects, but it also triggers excessive organic matter degradation, disrupts soil structure, and can cause compaction. For more information about conservation tillage, visit the Conservation Tillage Information Center site.

3. Carefully manage fertilizer and pesticide use. In this century, pesticides and chemical fertilizers have revolutionized U.S. agriculture. In addition to their desired effects, they can harm non-target organisms and pollute water and air if they are mismanaged. Nutrients from organic sources also can become pollutants when misapplied or over-applied. On the positive side, fertilizer can increase plant growth and the amount of organic matter returned to the soil.

4. Increase ground cover. Bare soil is susceptible to wind and water erosion, and to drying and crusting. Ground cover protects soil, provides habitats for larger soil organisms, such as insects and earthworms, and can improve water availability. Cover crops, perennials, and surface residue increase the amount of time that the soil surface is covered each year.

5. Increase plant diversity. Diversity is beneficial for several reasons. Each crop contributes a unique root structure and type of residue to the soil. A diversity of soil organisms can help control pest populations, and a diversity of cultural practices can reduce weed and disease pressures. Diversity across the landscape and over time can be increased by using buffer strips, small fields, contour strip cropping, crop rotations, and by varying tillage practices. Changing vegetation across the landscape or over time increases plant diversity, and the types of insects, microorganisms, and wildlife that live on your farm.

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Interpretative ratings help engineers, planners, and others understand how soil properties influence important nonagricultural uses, such as building site development and construction materials. The ratings indicate the most restrictive soil features affecting the suitability of the soils for these uses.

Soils are rated in their natural state. No unusual modification of the soil site or material is made other than that which is considered normal practice for the rated use. Even though soils may have limitations, it is important to remember that engineers and others can modify soil features or can design or adjust the plans for a structure to compensate for most of the limitations. Most of these practices, however, are costly. The final decision in selecting a site for a particular use generally involves weighing the costs of site preparation and maintenance.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

The classification of the soils in this survey area are shown in table 33 (p. 592). The extent of the soils are shown in table 4 (p. 282).

Interpretive Ratings

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

Rating Class Terms

Rating classes are expressed in the tables in terms that indicate the extent to which the soils are limited by all of the soil features that affect a specified use or in terms that indicate the suitability of the soils for the use. Thus, the tables may show limitation classes or suitability classes. Terms for the limitation classes are not limited, somewhat limited, and very limited. The suitability ratings are expressed as well suited, moderately suited, poorly suited, and unsuited or as good, fair, and poor.

Numerical Ratings

Numerical ratings in the tables indicate the relative severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use and the point at which the soil feature is not a limitation. The limitations appear in order from the most limiting to the least limiting. Thus, if more than one limitation is identified, the most severe limitation is listed first and the least severe one is listed last.

Cropland Limitations and Hazards

The management concerns affecting the use of the detailed map units in the survey area for crops are shown in table 8 (p. 291). The main concerns in managing nonirrigated cropland are controlling flooding and water erosion, preventing groundwater pollution, removing excess water, reducing surface crusting, reducing compaction, and maintaining soil tilth, organic matter, and fertility.

Generally, a combination of several practices is needed to control water erosion. Conservation tillage, stripcropping, contour farming, conservation cropping systems, crop residue management, diversions, and grassed waterways help to prevent excessive soil loss.

Figure 5. A well maintained drainage ditch with filter strip in Henry County.

Surface and/or subsurface drainage is used to remove excess water, lower seasonal high water tables, and to reduce ponding.

A surface crust forms in tilled areas after hard rains and may inhibit seedling emergence. Regular additions of crop residue, manure, or other organic materials help to improve soil structure and minimize crusting.

Figure 6 No-till results in increased residue on the surface and less soil erosion.

Tilling within the proper range in moisture content minimizes compaction.

Measures that are effective in maintaining soil tilth, organic matter, and fertility include applying fertilizer, both organic and inorganic, including manure; incorporating crop residue or green manure crops into the soil; and using proper crop rotations. Controlling erosion helps to prevent the loss of organic matter and plant nutrients and thus helps to maintain productivity, although the level of fertility can be reduced even in areas where erosion is controlled. All soils used for nonirrigated crops respond well to applications of fertilizer.

Some of the limitations and hazards shown in the table cannot be easily overcome. These are flooding, ponding, slope, limited organic matter content, and depth to bedrock.

Flooding.—Flooding can damage winter grain and forage crops. A tillage method that partly covers crop residue and leaves a rough or ridged surface helps to prevent removal of crop residue by floodwater. Tilling and planting should be delayed in the spring until flooding is no longer a hazard.

Ponding.—Surface drains helps to remove excess surface water and reduce damage from ponding.

Slope.—Where the slope is more than 25 percent, water erosion is excessive. The selection of crops and use of equipment is limited. Cultivation may be restricted.

Limited organic matter content.—Many soils that have a light colored surface layer have a low or moderately low organic matter content and weak or moderate structure. Regularly adding crop residue, manure, and other organic matter materials to the soil maintains or improves the organic matter content and the soil structure.

Depth to bedrock.—Rooting depth and available moisture may be limited by bedrock within a depth of 40 inches.

Additional limitations and hazards are as follows:

Potential for groundwater pollution.—This is a hazard in soils with excessive permeability, moderately deep or shallow bedrock, or a water table within the profile.

Limited available water capacity, poor tilth, restricted permeability, and surface crusting.—These limitations can be overcome by incorporating green manure crops, manure, or crop residue into the soil; applying a system of conservation tillage; and using conservation cropping systems.

Frost action.—Frost action can damage deep rooted legumes and some small grains.

Sandy layers.—Deep leaching of nutrients and pesticides may result from sandy layers. Crops generally respond better to smaller, more frequent applications of fertilizer and lime than to one large application.

Clodding. —Clods may inhibit germination, reduce water infiltration and increase runoff.

Subsidence of the muck. —Subsidence or shrinking occurs as a result of oxidation in the muck after the soil is drained. Control of the water table by subirrigation through subsurface drain lines reduces the hazards of subsidence, burning, and soil blowing.

High clay content.—The high clay content in the soil reduces rooting depth and water movement.

Root restrictive layers.—Root restrictive layers limit root growth and water movement.

Excessive alkalinity.—High pH in the upper part of the soil may inhibit plant growth and reduce availability of potassium and micronutrients.

Excessive acidity.—Low pH in the upper part of the soil may increase concentrations of aluminum and manganese and may injure plants.

Gravelly surface.—This limitation causes rapid wear of tillage equipment. It cannot be easily overcome.

Stony surface.—Stones or boulders on the surface can hinder normal tillage unless they are removed.

Following is an explanation of the criteria used to determine the limitations or hazards for cropland.

Easily eroded.—The surface K factor multiplied by the relative value of the slope is more than 2 (same as prime farmland criteria). (See table 29 for K factors.)

Erosion hazard.—The relative value of the slope is greater than 2.

Frequent flooding.—The component of the map unit is frequently flooded.

Occasional flooding.—The component of the map unit is occasionally flooded.

Limited available water capacity.—The available water capacity calculated to a depth of 60 inches or to a root-limiting layer is 6 inches or less.

Ponding.—Ponding duration is assigned to the component of the map unit.

Ponded for extended periods.—Very long ponding duration is assigned to the component of the map unit.

Gravelly surface. —The surface texture has flaggy, very flaggy, extremely flaggy, very gravelly, extremely gravelly, or very channery modifier.

Stony surface.—The surface texture has bouldery, very bouldery, extremely bouldery, stony, very stony, extremely stony, cobbly, very cobbly, or extremely cobbly modifier.

Sandy layers.—The family particle size is sandy, sandy or sandy-skeletal, sandy over loamy, sandy over clayey, sandy-skeletal, sandy-skeletal over clayey, or sandy-skeletal over loamy; or the subgroup is Arenic or Psammentic; or the suborder is Psamments.

Depth to bedrock.—Bedrock is at a depth of less than 40 inches.

High potential for groundwater pollution.—Hard bedrock is within a depth of 40 inches, or permeability is more than 6 inches per hour in some layer within a depth of 80 inches and is not 0.2 inch per hour or less in some layer within that depth.

Moderate potential for groundwater pollution.—An apparent water table is within a depth of 4 feet, or permeability is moderately rapid in some layer between depths of 24 and 60 inches and is not 0.2 inch per hour or less in some layer within a depth of 80 inches.

Poor tilth. —The component of the map unit is severely eroded, has less than 1 percent organic matter in the surface layer, or 35 percent or more clay in the surface layer.

Fair tilth.—The component of the map unit has a silty clay loam or clay loam surface layer and less than 35 percent clay or moderately eroded and a silt loam or loam surface texture.

Excessive acidity.—The upper range of the soil pH is less than 4.5 within 40 inches.

Excessive alkalinity.—The lower range of the soil pH is more than 7.9 within 40 inches.

Restricted permeability.—Permeability is 0.06 inches per hour or less within 40 inches and a seasonal high water table is within 18 inches.

Seasonal high water table.—The seasonal high water table is within a depth of 18 inches.

Excessive slope.—The upper slope range of the component of the map unit is more than 25 percent.

Surface crusting.—The organic matter content of the surface layer is less than or equal to 3 percent and the texture is silt loam or silty clay loam.

Surface compaction. —The component of the map unit has a silt loam, silty clay loam, clay loam, clay, or silty clay surface layer.

Frost action.—The component of the map unit has a high potential frost action.

Part of surface removed.—The surface layer of the component of the map unit is moderately eroded.

Most of surface removed.—The surface layer of the component of the map unit is severely eroded.

Subsidence of the muck. —The organic matter content of the surface layer of the component of the map unit is greater than or equal to 20 percent.

Wind erosion.—The upper range of the slope is less than or equal to 25 percent and the wind erodibility group is 1, 2, or 3. (See table 29 for wind erodibility group values.)

Clodding. —The relative value of the total clay in the surface layer is greater than 32 percent.

Root restrictive layer.—Fragipan or dense material within 40 inches.

High clay content.—A layer within 40 inches of the surface has clay content that averages between 40 and 60 percent.

Very high clay content. —A layer within 40 inches of the surface has clay content that averages more than 60 percent.

Crops and Pasture

General management needed for crops and pasture is suggested in this section. The system of land capability classification used by the Natural Resources Conservation Service is explained below.

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

Crop Yield Index

Table 9 (p. 299) is the crop yield index for Henry County. The yield index reflects the yield potential of a soil in relation to other soils in the county. It is based on the most productive soil, Hs—Hoytville silty clay, receiving a rating of 100, and other soils are ranked against this standard.

The yields used to calculate the index values are based on using good management practices.

To calculate estimated yields, use the yield index number as a percentage, and multiply it by the crop yield in the table header. For example, to calculate estimated corn yield for Ad, multiply 0.84 by the corn yield in the table header, which is 137. 0.84 x 137 = 115 bushels of corn estimated for Ad.

To use this yield index in the future to calculate estimated yields, use current yield data for the most productive soil as a reference.

Additional information on calculating estimated yields can be obtained from the local offi ce of the Natural Resources Conservation Service or the Cooperative Extension Service.

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, or for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit.

Capability classes, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have slight limitations that restrict their use.

Class 2 soils have moderate limitations that restrict the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that restrict the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that restrict the choice of plants or that require very careful management, or both.

Class 5 soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, woodland, or wildlife habitat.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, woodland, or wildlife habitat.

Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, woodland, or wildlife habitat.

Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or aesthetic purposes.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, 2e. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c,* used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class 1 there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w, s,* or *c* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, woodland, wildlife habitat, or recreation.

The acreage of soils in each capability class or subclass is shown in table 10 (p. 305). The capability classification of map units in this survey area is given in the section "Detailed Soil Map Units" and in the yields table.

Pasture and Hayland Suitability Groups

The pasture and hayland suitability group symbol for each soil is listed in each map unit description under the "Component interpretative groups" heading and in table 34 (p. 593). Soils assigned the same suitability group symbol require the same general management and have about the same potential productivity. The pasture and hayland suitability groups are organized by soil characteristics and limitations. The groups are defined as follows:

Group A soils have few limitations affecting the management and growth of climatically adapted plants.

Group A-1 consists of deep and very deep, well and moderately well drained soils. The available water capacity ranges from moderate to very high. Slopes range from 0 to 18 percent. Plants on these soils respond well to additions of lime. Frequent applications may be needed to maintain an adequate pH level. A low pH level in the subsoil shortens the life of some deep-rooted legumes.

Group A-2 consists of deep and very deep, well and moderately well drained soils. Available water capacity ranges from moderate to very high. Plants on these soils respond well to additions of lime. Frequent applications may be needed to maintain an adequate pH level. A low pH level in the subsoil shortens the life of some deep-rooted legumes. Slopes range from 18 to 25 percent. They may interfere with clipping, mowing, and spraying for weed control. The slopes increase the risk of erosion if the pasture is overgrazed or cultivated for reseeding. These soils are suited to no-till reseeding and interseeding.

Group A-3 consists of deep and very deep, well and moderately well drained soils. Available water capacity ranges from moderate to very high. Slopes range from 25 to 40 percent. These soils are not suited to pasture or hay, but some grass pasture is produced.

Group A-4 consists of deep and very deep, well and moderately well drained soils that have stones or boulders on the surface that are extensive enough to preclude the use of hay making equipment. Slopes range from 0 to 40 percent.

Group A-5 consists of well and moderately well drained soils that are subject to flooding. Grazing is limited during periods of stream overflow. The floodwater deposits sediments that lower the quality of the forage. The available water capacity ranges from moderate to very high. Slopes range from 0 to 18 percent.

Group A-6 consists of deep and very deep, well and moderately well drained soils that are subject to frost action, which can damage legumes. Mixing fibrous-rooted grasses with the legumes and applying good grazing management minimize the damage caused by frost action. The available water capacity ranges from moderate to very high. Slopes range from 0 to 18 percent.

Group B soils are limited because of droughtiness.

Group B-1 consists of deep and very deep, well and moderately well drained soils. The available water capacity is low or very low and limits forage growth and production. Slopes range from 0 to 25 percent.

Group B-2 consists of deep and very deep, well and moderately well drained soils. The available water capacity is low or very low and limits forage growth and production. Slopes range from 25 to 40 percent.

Group B-3 consists of somewhat poorly drained to well drained soils that are subject to flooding. Slopes range from 0 to 6 percent.

Group B-4 consists of deep and very deep, well and moderately well drained reclaimed mine soils. The available water capacity is low or very low. Slopes range from 0 to 25 percent. The substratum contains a high percentage of rock fragments. The rooting zone is 20 to 30 inches deep.

Group C soils are wet because of a seasonal high water.

Group C-1 consists of deep and very deep somewhat poorly drained, poorly drained, and very poorly drained soils. These soils normally respond well to subsurface drainage. Slopes range from 0 to 12 percent.

Group C-2 consists of deep and very deep somewhat poorly drained, poorly drained, and very poorly drained soils. The seasonal high water table limits the rooting depth of deep-rooted forage plants. Shallow-rooted species grow best on these soils. Subsurface drains are used to lower the seasonal high water table. The effectiveness of subsurface drainage is usually limited by permeability of the subsoil, high amounts of clay in the subsoil, or a fragipan. Because of the limited root zone, these soils are better suited to forage species that do not have a taproot than to other species. Slopes range from 0 to 12 percent.

Group C-3 consists of somewhat poorly drained, poorly drained, and very poorly drained soils that are subject to flooding. Grazing is limited during periods of stream overflow. The available water capacity ranges from moderate to very high. Slopes range from 0 to 6 percent. The seasonal high water table limits the rooting depth of forage plants. Shallow-rooted species grow best on these soils.

Group D soils have a high organic matter content.

Group D-1 consists of soils formed entirely or partially in organic material. Slope is 0 to 2 percent.

Group E consists of shallow soils in which the root zone is less than 20 inches deep.

Group E-1 consists of soils that are shallow or very shallow. The available water capacity is low or very low. It restricts forage production. These soils are well suited to native warm-season grasses. Slopes range from 0 to 25 percent.

Group E-2 consists of soils that have are shallow and very shallow or have a high bulk density and cobbles and stones in the upper part. The available water capacity is low or very low. Slopes range from 25 to 40 percent. Shallow-rooted species should be selected for planting.

Group E-3 soils have a high bulk density and cobbles and stones in the upper part. The available water capacity is low or very low. Slopes range from 0 to 25 percent.

Group F consists of soils that have a root zone that extends to a depth of 20 to 40 inches. These soils are better suited to forage species that do not have a taproot than to other species.

Group F-1 consists of moderately deep, well and moderately well drained soils. Slopes range from 0 to 25 percent.

Group F-2 consists of moderately deep, well and moderately well drained soils. Slopes range from 25 to 40 percent. This group generally is not suited to hay. Group F-3 consists of well and moderately well drained soils that are moderately deep to a fragipan. Slopes range from 0 to 25 percent.

Group F-4 consists of well and moderately well drained soils that are moderately deep to a fragipan. Slopes range from 25 to 40 percent.

Group F-5 consists of well and moderately well drained soils with high bulk density, a high clay content, slow permeability or a combination of these factors in the subsoil that restrict rooting depth. Slopes range from 0 to 25 percent.

Group F-6 consists of well and moderately well drained soils with high bulk density, a high clay content, slow permeability or a combination of these factors in the subsoil that restrict rooting depth. Slopes range from 25 to 40 percent.

Group F-7 consists of somewhat poorly drained, poorly drained, and very poorly drained soils with a high clay content and very slow permeability in the subsoil that restrict rooting depth. Slopes range from 0 to 12 percent.

Group G soils have chemical properties that are unfavorable for many climatically adapted plants.

Group G-1 consists of well and moderately well drained soils that are shallow or moderately deep to toxic spoil from surface mine operations. Available water capacity is low or very low in the root zone. Slopes range from 0 to 25 percent.

Group G-2 consists of well and moderately well drained soils that are shallow or moderately deep to toxic spoil from surface mine operations. Slopes range from 25 to 40 percent.

Group H soils are toxic or too steep for forage production.

Group H-1 consists of soils toxic materials from surface mining operation or on slopes greater than or equal to 40 percent. These soils generally are unsuited to pasture and hay.

Woodland Management and Productivity

The tables in this section can help woodland owners or managers plan the use of soils for wood crops. They show the potential productivity of the soils for wood crops and rate the soils according to the limitations that affect various aspects of woodland management.

Woodland Management

In table 11 (p. 306), table 13 (p. 334), and table 14 (p. 347), interpretive ratings are given for various aspects of woodland management. The ratings are both verbal and numerical.

Some rating class terms indicate the degree to which the soils are suited to a specified woodland management practice. *Well suited* indicates that the soil has features that are favorable for the specified practice and has no limitations. Good performance can be expected, and little or no maintenance is needed. *Moderately suited* indicates that the soil has features that are moderately favorable for the specified practice. One or more soil properties are less than desirable, and fair performance can be expected. Some maintenance is needed. *Poorly suited* indicates that the soil has one or more properties that are unfavorable for the specified practice. Overcoming the unfavorable properties requires special design, extra maintenance, and costly alteration. *Unsuited* indicates that the expected performance of the soil is unacceptable for the specified practice or that extreme measures are needed to overcome the undesirable soil properties.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified woodland management practice (1.00) and the point at which the soil feature is not a limitation (0.00).

Rating class terms for fire damage and seedling mortality are expressed as *low, moderate,* and *high*. Where these terms are used, the numerical ratings indicate gradations between the point at which the potential for fire damage or seedling mortality is highest (1.00) and the point at which the potential is lowest (0.00).

The paragraphs that follow indicate the soil properties considered in rating the soils for woodland management practices. More detailed information about the criteria used in the ratings is available in the "National Forestry Manual," which is available in local offices of the Natural Resources Conservation Service or on the Internet .

Ratings in the column *erosion hazard* are based on slope and on soil erodibility factor K. The soil loss is caused by sheet or rill erosion in off-road or off-trail areas where 50 to 75 percent of the surface has been exposed by logging, grazing, mining, or other kinds of disturbance. The hazard is described as slight, moderate, severe, or very severe. A rating of *slight* indicates that erosion is unlikely under ordinary climatic conditions; *moderate* indicates that some erosion is likely and that erosion-control measures may be needed; *severe* indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised; and *very severe* indicates that significant erosion is expected, loss of soil productivity and off–site damage are likely, and erosion–control measures are costly and generally impractical.

Ratings in the column *seedling mortality* are based on flooding, ponding, depth to a water table, content of lime, reaction, salinity, available water capacity, soil moisture regime, soil temperature regime, aspect, and slope. The soils are described as having a low, moderate, or high potential for seedling mortality.

Ratings in the column *soil rutting hazard* are based on depth to a water table, rock fragments on or below the surface, the Unified classification, depth to a restrictive layer, and slope. Ruts form as a result of the operation of woodland equipment. The hazard is described as slight, moderate, or severe. A rating of *slight* indicates that the soil is subject to little or no rutting, *moderate* indicates that rutting is likely, and *severe* indicates that ruts form readily.

For *limitations affecting construction of haul roads and log landings*, the ratings are based on slope, flooding, permafrost, plasticity index, the hazard of soil slippage, content of sand, the

Unified classification, rock fragments on or below the surface, depth to a restrictive layer that is indurated, depth to a water table, and ponding. The limitations are described as slight, moderate, or severe. A rating of *slight* indicates that no significant limitations affect construction activities, *moderate* indicates that one or more limitations can cause some difficulty in construction, and *severe* indicates that one or more limitations can make construction very difficult or very costly.

Ratings in the column *suitability for roads (natural surface)* are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification, depth to a water table, ponding, flooding, and the hazard of soil slippage. The ratings indicate the suitability for using the natural surface of the soil for roads. The soils are described as well suited, moderately suited, or poorly suited to this use.

Ratings in the column *harvest equipment operability* are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification, depth to a water table, and ponding. The soils are described as well suited, moderately suited, or poorly suited to this use.

Ratings in the column *suitability for mechanical planting* are based on slope, depth to a restrictive layer, content of sand, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, moderately suited, poorly suited, or unsuited to these methods of planting. It is assumed that necessary site preparation is completed before seedlings are planted.

Ratings in the column *suitability for site preparation* are based on slope, depth to a restrictive layer, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsuited to this management activity. The part of the soil from the surface to a depth of about 1 foot is considered in the ratings.

Ratings in the column *potential for damage to soil by fire* are based on texture of the surface layer, content of rock fragments and organic matter in the surface layer, thickness of the surface layer, and slope. The soils are described as having a low, moderate, or high potential for this kind of damage. The ratings indicate an evaluation of the potential impact of prescribed fires or wildfires that are intense enough to remove the duff layer and consume organic matter in the surface layer.

Woodland Productivity

In table 12 (p. 315), 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. More detailed information regarding site index is available in the "National Forestry Manual," which is available in local offices of the Natural Resources Conservation Service or on the Internet.

The *volume of wood fiber*, a number, is the yield likely to be produced by the most important tree species. This number, expressed as cubic feet per acre per year and calculated at the age of culmination of the mean annual increment (CMAI), indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

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

Windbreaks and Environmental Plantings

Figure 7. There are many windbreaks, in Henry County that were planted to minimize wind erosion. This windbreak is on the Mermill soil series

Farm and homestead windbreaks are rows of trees or shrubs established adjacent to farm buildings, feedlots, and homes. These windbreaks are usually planted perpendicular to the prevailing winter wind. Planting multiple rows of various species provides the best protection from winds and results in more varied wildlife habitat. Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To ensure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Table 15 (p. 358) shows the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates in table 15 are based on measurements and observation of established plantings that have been given adequate care. They can be used as a guide in planning windbreaks and screens. Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from the local office of the Natural Resources Conservation Service, the Ohio Department of Natural Resources, Division of Forestry, or of the Cooperative Extension Service or from a commercial nursery.

Recreational Development

The soils of the survey area are rated in table 16 (p. 368) and table 17 (p. 383) according to limitations that affect their suitability for recreation. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the recreational uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The ratings in the tables are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation also are important. Soils that are subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

The information in table 16 (p. 368) and table 17 (p. 383) can be supplemented by other information in this survey, for example, interpretations for building site development, construction materials, sanitary facilities, and water management.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The ratings are based on the soil properties that affect the ease of developing camp areas and the performance of the areas after development. Slope, stoniness, and depth to bedrock or a cemented pan are the main concerns affecting the development of camp areas. The soil properties that affect the performance of the areas after development are those that influence trafficability and promote the growth of vegetation, especially in heavily used areas. For good trafficability, the surface of camp areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

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

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

Paths and trails for hiking and horseback riding should require little or no slope modification through cutting and filling. The ratings are based on the soil properties that affect trafficability and erodibility. These properties are stoniness, depth to a water table, ponding, flooding, slope, and texture of the surface layer.

Off-road motorcycle trails require little or no site preparation. They are not covered with surfacing material or vegetation. Considerable compaction of the soil material is likely. The ratings are based on the soil properties that influence erodibility, trafficability, dustiness, and the ease of revegetation. These properties are stoniness, slope, depth to a water table, ponding, flooding, and texture of the surface layer.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer. The suitability of the soil for traps, tees, roughs, and greens is not considered in the ratings.

Wildlife Habitat

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

In table 18 (p. 395), the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of grain and seed crops are corn, wheat, oats, soybeans, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture also are considerations. Examples of grasses and legumes are fescue, lovegrass, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, wheatgrass, and grama.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, raspberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are autumn-olive, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, wildrice, saltgrass, cordgrass, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include bobwhite quail, pheasant, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous and/or coniferous plants and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, ruffed grouse, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, and deer.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the data in the tables described under the heading "Soil Properties."

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

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

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design. Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about particle-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 7 feet of the surface, soil wetness, depth to a water table, ponding, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses. This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earth fill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils. The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations. Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Construction Materials

Table 19 (p. 402) and table 20 (p. 413) give information about the soils as potential sources of gravel, sand, topsoil, reclamation material, and roadfill. Normal compaction, minor processing, and other standard construction practices are assumed.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In table 19 (p. 402), only the likelihood of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material. The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the bottom layer of the soil contains sand or gravel, the soil is considered a likely source regardless of thickness. The assumption is that the sand or gravel layer below the depth of observation exceeds the minimum thickness.

The soils are rated *good, fair,* or *poor* as potential sources of sand and gravel. A rating of *good* or *fair* means that the source material is likely to be in or below the soil. The bottom layer and the thickest layer of the soils are assigned numerical ratings. These ratings indicate the likelihood that the layer is a source of sand or gravel. The number 0.00 indicates that the layer is a poor source. The number 1.00 indicates that the layer is a good source. A number between 0.00 and 1.00 indicates the degree to which the layer is a likely source.

The soils are rated *good, fair,* or *poor* as potential sources of reclamation material, roadfill, and topsoil. The features that limit the soils as sources of these materials are specified in the tables. The numerical ratings given after the specified features indicate the degree to which the features limit the soils as sources of reclamation material, roadfill, or topsoil. The lower the number, the greater the limitation.

Reclamation material is used in areas that have been drastically disturbed by surface mining or similar activities. When these areas are reclaimed, layers of soil material or unconsolidated geological material, or both, are replaced in a vertical sequence. The reconstructed soil favors plant growth. The ratings in the table do not apply to quarries and other mined areas that require an offsite source of reconstruction material. The ratings are based on the soil properties that affect erosion and stability of the surface and the productive potential of the reconstructed soil. These properties include the content of sodium, salts, and calcium carbonate; reaction; available water capacity; erodibility; texture; content of rock fragments; and content of organic matter and other features that affect fertility.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

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

The ratings are based on the amount of suitable material and on soil properties that affect the ease of excavation and the performance of the material after it is in place. The thickness of the suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the AASHTO classification of the soil) and linear extensibility (shrink-swell potential).

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area. The ratings are based on the soil properties that affect plant growth; the ease of excavating, loading, and spreading the material; and reclamation of the borrow area. Toxic substances, soil reaction, and the properties that are inferred from soil texture, such as available water capacity and fertility, affect plant growth. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, depth to bedrock or a cemented pan, and toxic material.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Building Site Development

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. Table 21 (p. 431) and table 22 (p. 444) show the degree and kind of soil limitations that affect dwellings with and without basements, small commercial buildings, local roads and streets, shallow excavations, and lawns and landscaping.

The ratings in the tables are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected. *Numerical ratings* in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Dwellings are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet.

The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification.

The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

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

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

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

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

Sanitary Facilities

Table 23 (p. 460) and table 24 (p. 477) show the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, sanitary landfills, and daily cover for landfill. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. Not limited indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. Somewhat limited indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. Very limited indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 60 inches is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in down slope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Considered in the ratings are slope, permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, flooding, large stones, and content of organic matter.

Soil permeability is a critical property affecting the suitability for sewage lagoons. Most porous soils eventually become sealed when they are used as sites for sewage lagoons. Until sealing occurs, however, the hazard of pollution is severe. Soils that have a permeability rate of more than 2 inches per hour are too porous for the proper functioning of sewage lagoons. In these soils, seepage of the effluent can result in contamination of the ground water. Groundwater contamination is also a hazard if fractured bedrock is within a depth of 40 inches, if the water table is high enough to raise the level of sewage in the lagoon, or if floodwater overtops the lagoon.

A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor. If the lagoon is to be uniformly deep throughout, the slope must be gentle enough and the soil material must be thick enough over bedrock or a cemented pan to make land smoothing practical.

A *trench sanitary landfill* is an area where solid waste is placed in successive layers in an excavated trench. The waste is spread, compacted, and covered daily with a thin layer of soil excavated at the site. When the trench is full, a final cover of soil material at least 2 feet thick is placed over the landfill. The ratings in the table are based on the soil properties that affect the risk of pollution, the ease of excavation, trafficability, and revegetation. These properties include permeability, depth to bedrock or a cemented pan, depth to a water table, ponding, slope, flooding, texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, onsite investigation may be needed.

Hard, nonrippable bedrock, creviced bedrock, or highly permeable strata in or directly below the proposed trench bottom can affect the ease of excavation and the hazard of groundwater pollution. Slope affects construction of the trenches and the movement of surface water around the landfill. It also affects the construction and performance of roads in areas of the landfill.

Soil texture and consistence affect the ease with which the trench is dug and the ease with which the soil can be used as daily or final cover. They determine the workability of the soil when dry and when wet. Soils that are plastic and sticky when wet are difficult to excavate, grade, or compact and are difficult to place as a uniformly thick cover over a layer of refuse.

The soil material used as the final cover for a trench landfill should be suitable for plants. It should not have excess sodium or salts and should not be too acid. The surface layer generally has the best workability, the highest content of organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

In an *area sanitary landfill*, solid waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site. A final cover of soil material at least 2 feet thick is placed over the completed landfill. The ratings in the table are based on the soil properties that affect trafficability and the risk of pollution. These properties include flooding, permeability, depth to a water table, ponding, slope, and depth to bedrock or a cemented pan.

Flooding is a serious problem because it can result in pollution in areas downstream from the landfill. If permeability is too rapid or if fractured bedrock, a fractured cemented pan, or the water table is close to the surface, the leachate can contaminate the water supply. Slope is a consideration because of the extra grading required to maintain roads in the steeper areas of the landfill. Also, leachate may flow along the surface of the soils in the steeper areas and cause difficult seepage problems.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste. The ratings in the table also apply to the final cover for a landfill. They are based on the soil properties that affect workability, the ease of digging, and the ease of moving and spreading the material over the refuse daily during wet and dry periods. These properties include soil texture, depth to a water table, ponding, rock fragments, slope, depth to bedrock or a cemented pan, reaction, and content of salts, sodium, or lime.

Loamy or silty soils that are free of large stones and excess gravel are the best cover for a landfill. Clayey soils may be sticky and difficult to spread; sandy soils are subject to wind erosion.

Slope affects the ease of excavation and of moving the cover material. Also, it can influence runoff, erosion, and reclamation of the borrow area.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. It should not have excess sodium, salts, or lime and should not be too acid.

Agricultural Waste Management

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

Table 25 (p. 492) shows the degree and kind of soil limitations affecting the treatment of agricultural waste, including municipal and food-processing wastewater and effluent from lagoons or storage ponds. Municipal wastewater is the waste stream from a municipality. It contains domestic waste and may contain industrial waste. It may have received primary or secondary treatment. It is rarely untreated sewage. Food-processing wastewater results from the preparation of fruits, vegetables, milk, cheese, and meats for public consumption. In places it is high in content of sodium and chloride. In the context of these tables, the effluent in lagoons and storage ponds is from facilities used to treat or store food-processing wastewater or domestic or animal waste. Domestic and food-processing wastewater is very dilute, and the effluent from the facilities that treat or store it commonly is very low in content of carbonaceous and nitrogenous material; the content of nitrogen commonly ranges from 10 to 30 milligrams per liter. The wastewater from animal waste treatment lagoons or storage ponds, however, has much higher concentrations of these materials, mainly because the manure has not been diluted as much as the domestic waste. The content of nitrogen in this wastewater generally ranges from 50 to 2,000 milligrams per liter. When wastewater is applied, checks should be made to ensure that nitrogen, heavy metals, and salts are not added in excessive amounts.

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

Figure 8. Application of livestock waste on a cultivated field.

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect agricultural waste management. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

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

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

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

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

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

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

Water Management

Table 26 (p. 513) and table 27 (p. 527) give information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; aquifer-fed excavated ponds; grassed waterways; terraces and diversions; and drainage. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. Embankments that have zoned construction (core and shell) are not considered. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer–fed excavated ponds are pits or dugouts that extend to a groundwater aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

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 a cemented pan affect the construction of grassed waterways. A hazard of water erosion, low available water capacity, restricted rooting depth, toxic substances such as salts and sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind erosion or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

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, a cemented pan, or other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and the potential for frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or 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, and sulfur. Availability of drainage outlets is not considered in the ratings.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey.

Soil properties are ascertained by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine particle-size distribution, plasticity, and compaction characteristics. These results are at the Ohio State University, School of Natural Resources, Columbus, Ohio; the Ohio Department of Natural Resources, Division of Soil and Water Conservation, Columbus, Ohio; and the USDA–Natural Resources Conservation Service, state office, Columbus, Ohio.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties are shown in tables. They include engineering index properties, physical and chemical properties, and pertinent soil and water features.

Engineering Index Properties

Table 28 (p. 543) gives the engineering classifications and the range of index properties for the layers of each soil in the survey area.

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter (figure 9). "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (ASTM, 2001) and the system adopted

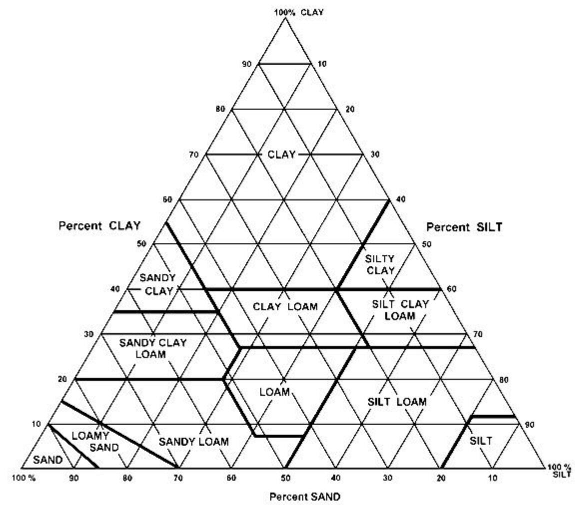

Figure 9. Textural Triangle

by the American Association of State Highway and Transportation Officials (AASHTO, 2000).

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

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

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in table 28 (p. 543).

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry–weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

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

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

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

Physical Properties

Table 29 (p. 557) shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In table 29 (p. 557), the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink–swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3- or 1/10-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink–swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates in the table indicate the rate of water movement, in inches per hour (in/hr), when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

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 the basis of measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air–dry to field capacity. The classes are low, a change of 3 percent; moderate, 3 to 6 percent; high, more than 6 percent; and very high, greater than 9 percent.

Erosion factors are shown in table 29 (p. 557) as the K factor (Kw and Kf) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and permeability. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are as follows:

1.—Coarse sands, sands, fine sands, and very fine sands.

2.—Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, ash material, and sapric soil material.

3.—Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams.

4L.—Calcareous loams, silt loams, clay loams, and silty clay loams.

4.—Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay.

5.—Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material.

6.—Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay.

7.—Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material.

8.—Soils that are not subject to wind erosion because of rock fragments on the surface or because of surface wetness.

Chemical Properties

Table 30 (p. 568) shows estimates of some chemical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Soil reaction is a measure of acidity or alkalinity. The pH of each soil horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 30 (p. 568), the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained by returning crop residue to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Cation–exchange capacity is the total amount of extractable bases that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation–exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation–exchange capacity. The ability to retain cations reduces the hazard of groundwater pollution.

Calcium carbonate equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil. Incorporating nitrogen fertilizer into calcareous soils helps to prevent nitrite accumulation and ammonium–N volatilization.

Water Features

Table 31 (p. 579) gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long–duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

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

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

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink–swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

The *months* in the table indicate the portion of the year in which the feature is most likely to be a concern.

Water table refers to a saturated zone in the soil. Table K1 indicates, by month, depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. Table 31 indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and *frequency* are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood–prone areas at specific flood frequency levels.

Soil Features

Table 32 (p. 587) gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness and thickness of the restrictive layer, both of which significantly affect the ease of excavation. Depth to top is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence generally results from either desiccation and shrinkage or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. The table shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors.

Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

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

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

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

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (Soil Survey Staff, 1998 and 1999). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 33 (p. 592) shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER.—Twelve soil orders are recognized. The differences among orders reflect the dominant soil–forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Alfisol.

SUBORDER.—Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Udalf (*Ud*, meaning humid, plus *alf*, from Alfisol).

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

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

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

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

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. Pedon descriptions published in this survey come from Henry County or adjacent counties. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" (Soil Survey Division Staff, 1993). Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" (Soil Survey Staff, 1999) and in "Keys to Soil Taxonomy" (Soil Survey Staff, 1998). Unless otherwise indicated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

Adrian Series

The Adrian series are dark-colored, organic soils that are very poorly drained. These soils consist of layers of muck that are underlain by calcareous sandy material. They occupy low depressional areas on the lake plain in the northeastern part of Liberty Township and the northwestern part of Washington Township. The native vegetation on these soils was mixed hardwoods, and reeds, sedges, and grasses common to bogs or marshy areas.

In a representative profile of an Adrian soil that is cultivated, the surface layer is black muck to a depth of 22 inches. Below the muck is calcareous sand.

Adrian soils have moderately rapid permeability in the muck layers and rapid permeability in the sandy layers. They are seasonally saturated for long periods unless they have been adequately drained. They have medium to high available moisture capacity. The root zone is deep in summer when the water table is low and in artificially drained areas.

Representative profile of Adrian muck, in a cultivated field in Washington Township (W½NW¼SW¼NW¼ sec. 20, T. 6 N., R. 8 E.):

Oa1-0 to 8 inches, black (10YR 2/1) muck (sapric material); moderate medium. granular structure; very friable; many roots; neutral; abrupt smooth boundary.

Oa2-8 to 15 inches, black (10YR 2/1) muck (sapric material); weak fine and medium subangular blocky structure; very friable; many roots; neutral; clear smooth boundary.

Oa3-15 to 22 inches, black (N 2/0) muck (sapric material); moderate coarse angular blocky structure; friable; many roots; neutral; abrupt smooth boundary.

IIC-22 to 50 inches, gray (10YR 5/1 to 6/1) fine sand; common medium distinct brown (10YR 5/3) and yellowish brown (10YR 5/4) mottles; single grain; loose; moderately alkaline; calcareous.

The thickness of the muck ranges from 16 to 50 inches. The thickness of the muck and the depth to carbonates generally are the same, but the Oa3 horizon can be mildly alkaline. The muck layers range from strongly acid to mildly alkaline. The dark colored layers are black (10YR 2/1 to N 2/0), very dark brown (10YR 2/2), or very dark gray (10YR 3/1). The IIC horizon is commonly gray (10YR 5/1 to 6/1) or pale brown (10YR 6/3) and commonly is mottled with brown (10YR 5/3) and yellowish brown (10YR 5/4 to 5/6). This horizon generally is fine sand but ranges to loamy fine sand or loamy sand.

Adrian soils differ from very poorly drained Warners soils by having a no horizon that is sandy rather than marly. They also have thicker upper layers that are higher in content of organic matter than those in Warners soils. They are organic soils in contrast to Granby and other very poorly drained soils in the county, which are mineral soils.

Arkport Series

The Arkport series consists of deep, gently sloping to sloping, sandy soils that are well drained. These soils formed in thick sandy material on the crests and slopes of dunes and ridges on the lake plain in Liberty and Washington Townships.

In a representative profile of an Arkport soil that is cultivated, the plow layer is dark grayish-brown fine sand about 8 inches thick. The subsurface layer, to a depth of 24 inches, is light yellowish-brown fine sand. The subsoil layers are in thick bands, or lamellae, between depths of 24 and 58 inches. They are strong brown in contrast to layers above and below and are slightly more clayey than the surface layer. The underlying material, between depths of 58 to 75 inches, is calcareous fine sand.

Arkport soils have moderately rapid permeability. They have low available moisture capacity and a deep root zone. They are subject to severe soil blowing during windy periods if they are bare. Arkport soils can be medium acid within the upper 2 feet.

Representative profile of Arkport fine sand, 2 to 6 percent slopes, along a road cut in Washington Township (SE¼SE¼SE¼NW¼ sec. 19, T. 6 N., R. 8 E.):

Ap-0 to 8 inches, dark grayish brown (10YR 4/2, 4/2 rubbed) fine sand; weak fine granular structure; loose; many roots; some mixing with A2 horizon in lowermost inch; medium acid; abrupt smooth boundary.

A21-8 to 24 inches, light yellowish brown (10YR 6/4) fine sand; single grain; loose; many roots; few fine yellowish brown (l0YR 5/6) spots of iron oxide; slightly acid; abrupt wavy boundary.

B21t-24 to 29 inches, strong brown (7.5YR 5/6) fine sandy loam; moderate medium subangular blocky structure; friable; common roots; thin patchy dark brown (7.5YR 4/4) clay films on vertical ped faces; medium acid; abrupt wavy boundary.

A22-29 to 34 inches, light yellowish brown (10YR 6/4) fine sand; single grain; loose; few roots; common fine strong brown (7.5YR 5/6) spots of iron oxide; some nodules of dark brown (7.5YR 4/4) fine sandy loam scattered within horizon; slightly acid; abrupt wavy boundary.

B22t-34 to 51 inches, strong brown (7.5YR 5/6) fine sandy loam; moderate medium subangular blocky structure; firm; few roots; thin patchy dark brown clay films, primarily on vertical ped faces, very patchy on horizontal ped faces; horizon contains pockets of light yellowish brown (10YR 6/4) fine sand about 11 inches thick and 8 to 15 inches wide; sand in the pockets is single grain and loose; slightly acid; gradual smooth boundary.

B23t-51 to 58 inches, strong brown (7.5YR 5/6) fine sandy loam; moderate medium subangular blocky structure; friable; few roots; thin patchy dark brown (7.5YR 4/4) clay films on vertical ped faces, very patchy on horizontal faces; neutral; abrupt wavy boundary.

C-58 to 75 inches, olive yellow (2.5Y 6/6) fine sand; common medium brownish yellow (10YR 6/6) and light gray (10YR 7/2) mottles; single grain; loose; mildly alkaline; calcareous.

The thickness of the solum, and commonly the depth to carbonates, ranges from about 44 to 65 inches, but in some places the depth to carbonates is 1 foot to 2 feet below the solum.

The Ap horizon is 3 to 8 inches thick, depending on soil loss through soil blowing. The Ap horizon generally is dark grayish brown (10YR 4/2) or brown (10YR 4/3). The A2 horizon is light yellowish brown (10YR 6/4), brownish yellow (10YR 6/6), or yellowish brown (10YR 5/6). The texture of the A2 horizon is commonly fine sand, but it ranges to loamy fine sand.

The B2t horizon generally is strong brown (7.5YR 5/6 and 7.5YR 5/8), but in some places it ranges to dark brown (7.5YR 4/4). The dominant texture is fine sandy loam, but in some places there are layers of loamy fine sand or light sandy clay loam. The B2t horizon occurs either as a continuous layer ranging from about 10 to 34 inches in thickness or as a horizon that has common pockets of sand, or in some places it occurs as several bands or lamella 4 to 10 inches in thickness.

The C horizon is commonly light brownish gray (2.5Y 6/2), light yellowish brown (2.5Y 6/4), or pale brown (10YR 6/3), but it ranges to olive yellow (2.5Y 6/6) or light olive brown (2.5Y 5/4). This horizon generally is fine sand, but layers of loamy fine sand, loamy sand, and medium sand occur in some places.

Arkport soils are the well drained members of a drainage sequence that includes the moderately well drained Galen soils. They are adjacent to these soils in many places. They are commonly adjacent to somewhat poorly drained Tedrow soils and very poorly drained Granby soils. In some places they are adjacent to Spinks, Oakville, and Ottokee soils. Arkport soils are similar to those soils in some properties, but they have thicker Bt layers.

Aurand Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderate in the upper part of the solum, moderately slow or slow in the lower part of the solum, and slow or very slow in the substratum
Parent material: Loamy glaciolacustrine deposits and the underlying till
Landform: Flats, knolls and rises on beach ridges and lake plains
Position on the landform: Footslopes, summits, shoulders
Slope: 0 to 2 percent
Adjacent soils: Mermill, Shawtown

Taxonomic class: Fine-loamy, mixed, active, mesic Aquic Argiudolls

Typical Pedon

Aurand loam, 0 to 2 percent slopes, in Hancock County, Ohio; Portage Township; about 1.2 miles east of McComb; about 800 feet north and 540 feet east of the southwest corner of sec. 19, T. 2 N., R. 10 E.

Ap=0 to 11 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; moderate fine and medium granular structure; friable; common fine roots; common fine faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 2 percent rock fragments; slightly acid; clear smooth boundary.

Bt1=11 to 17 inches; brown (10YR 4/3) clay loam; moderate fine and very fine subangular blocky structure; friable; common fine roots; common faint dark grayish brown (10YR 4/2) clay films on faces of peds; common distinct very dark grayish brown (10YR 3/2) organic coatings on vertical faces of peds; common medium faint dark grayish brown (10YR 4/2) iron depletions in the matrix; few fine and medium prominent strong brown (7.5YR 5/6) and common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine and medium faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 2 percent rock fragments; neutral; gradual wavy boundary.

Bt2=17 to 22 inches; yellowish brown (10YR 5/4) clay loam; moderate fine and medium subangular blocky structure; friable; few fine roots; common faint grayish brown (10YR 5/2) clay films on faces of peds; few distinct very dark grayish brown (10YR 3/2) organic coatings on vertical faces of peds; common fine and medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common fine and medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine and medium distinct very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 1 percent rock fragments; slightly alkaline; clear wavy boundary.

Bt3=22 to 29 inches; yellowish brown (10YR 5/4) loam with thin strata of sandy loam; weak fine and medium subangular blocky structure; friable; few fine roots; common distinct grayish brown (10YR 5/2) clay films on faces of peds; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine and medium distinct very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 1 percent rock fragments; slightly alkaline; clear wavy boundary.

Btg=29 to 33 inches; grayish brown (10YR 5/2) silty clay loam with thin strata of sandy loam and loam; weak fine and medium subangular blocky structure; friable; few fine roots; common faint

grayish brown (10YR 5/2) clay films on faces of peds; common medium distinct dark yellowish brown (10YR 4/4) and few medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine and medium faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 1 percent rock fragments; slightly effervescent discontinuously in the matrix; slightly alkaline; abrupt wavy boundary.

2BC=33 to 48 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak medium and coarse subangular blocky structure; firm; few fine roots; few distinct gray (10YR 5/1) coatings on vertical faces of peds; common distinct light gray (10YR 7/1) calcium carbonate coatings on vertical faces of peds; common medium distinct gray (10YR 5/1) iron depletions in the matrix; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 2 percent rock fragments; strongly effervescent; moderately alkaline; gradual irregular boundary.

2Cd=48 to 62 inches; brown (10YR 4/3) silty clay loam; massive, with widely spaced vertical fractures; very firm; common fine and medium distinct gray (10YR 5/1) iron depletions in the matrix; few fine and medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 3 percent rock fragments; strongly effervescent; moderately alkaline; clear wavy boundary.

2Cdg=62 to 80 inches; dark gray (10YR 4/1) silty clay loam; massive, with widely spaced vertical fractures; very firm; common fine and medium distinct yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; 3 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 15 inches
Thickness of the solum: 40 to 60 inches
Depth to carbonates: 25 to 50 inches
Depth to till: 20 to 40 inches
Depth to dense material: 40 to 60 inches
Depth to bedrock: More than 80 inches

Ap or A horizon:
Color=hue of 10YR, 2.5Y, or is neutral, value of 2, 2.5, or 3, chroma of 0 to 2
Texture=loam or fine sandy loam
Content of rock fragments=0 to 10 percent

Bt or Btg horizon:
Color=hue of 10YR or 2.5Y, value of 4 or 5, chroma of 2 to 6
Texture=loam, clay loam, sandy clay loam, or silty clay loam or the gravelly analogs of these textures; thin subhorizons of sandy loam, fine sandy loam, loamy sand, or loamy fine sand or the gravelly analogs of these textures are in some pedons
Content of rock fragments=0 to 20 percent

2BC, 2BCg, 2Cd, or 2Cdg horizons:
Color=hue of 10YR, 2.5Y, or is neutral, value of 4 or 5, chroma of 0 to 4
Texture=clay loam, silty clay loam, or clay
Content of rock fragments=1 to 7 percent

Bixler Series

The Bixler series consists of deep, somewhat poorly drained soils on outwash plains, deltas, and beach ridges. These soils formed in sandy material 20 to 35 inches deep to stratified silty and sandy materials. Permeability is rapid in the upper part and moderate **in** the substratum. Slope ranges from 0 to 3 percent.

Bixler soils are commonly adjacent to Colwood, Dixboro, and Lamson soils and are similar to Rimer and Tedrow soils. Colwood soils have a mollic epipedon, are very poorly drained, and contain less sand than Bixler soils. Dixboro soils have more clay than Bixler soils and have less sand in the surface layer and in the upper part of the subsoil. Lamson soils are very poorly drained. Rimer soils have more clay in both the lower part of the subsoil and the substratum. Tedrow soils are more sandy throughout than the Bixler soils.

Typical pedon of Bixler loamy fine sand, 0 to 3 percent slopes, is in Fulton County about 3 miles north of Tedrow, in Chesterfield Township; about 2,350 feet south and 880 feet west of the northeast corner of sec. 31, T. 9 S., R. 2 E.

Ap—0 to 10 inches; dark brown (10YR 4/3) loamy fine sand; pale brown (10YR 6/3) dry; weak fine subangular blocky structure; very friable; common fine roots; medium acid; abrupt smooth boundary.

Bw1—10 to 16 inches; yellowish brown (10YR 5/6) loamy fine sand; very weak medium subangular blocky structure; very friable; common fine roots; neutral; gradual wavy boundary.

Bw2—16 to 22 inches; brownish yellow (10YR 6/6) loamy fine sand; weak medium subangular blocky structure; very friable; common fine roots; few fine faint dark brown (10YR 3/3) stains and concretions; neutral; gradual wavy boundary.

Bt1— 22 to 25 inches; brown (10YR 5/3) fine sandy loam; common medium distinct yellowish brown (10YR 5/4 and 5/6) and grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure; friable; few fine roots; thin patchy dark grayish brown (10YR 4/2) clay films; common fine distinct very dark grayish brown (10YR 3/2) stains; neutral; clear smooth boundary.

2Bt2—25 to 30 inches; brown (10YR 5/3) silt loam; many medium distinct yellowish brown (10YR 5/6) and grayish brown (2.5Y 5/2) mottles; moderate fine and medium subangular blocky structure; friable; few fine roots; thin patchy

grayish brown (10YR 5/2) clay films; few fine distinct dark grayish brown (10YR 3/2) concretions; mildly alkaline; abrupt wavy boundary.

2Cg1—30 to 43 inches; light brownish gray (2.5Y 6/2) and pale brown (10YR 6/3) stratified very fine sand and silt; common fine distinct yellowish brown (10YR 5/6) mottles; massive; friable; few fine distinct very dark grayish brown (10YR 3/2) concretions; strong effervescence; moderately alkaline; abrupt smooth boundary.

2Cg2—43 to 60 inches; light brownish gray (2.5Y 6/2) and yellowish brown (10YR 5/6) stratified silt and very fine sand and a few bands of silty clay loam; common medium distinct dark yellowish brown (10YR 4/4) and few fine faint pale brown (10YR 6/3) mottles; massive; friable; strong effervescence; moderately alkaline.

The solum ranges from 28 to 44 inches in thickness. The sandy material ranges from 20 to 35 inches in thickness. Reaction ranges from medium acid to neutral in the A, Bw, and Bt horizons, from slightly acid to mildly i alkaline in the 2Bt horizon, and from neutral to moderately alkaline in the 2C horizon. The A, Bw, and Bt horizons are 0 to 5 percent gravel.

The Ap horizon has hue of 10YR, value of 2 to 4, and chroma of 1 to 3. The Bw horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6. Texture of the Bw horizon includes loamy fine sand and fine sand. The Bt horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 2 to 6. It is fine sandy loam, loam, or sandy loam. The 2Bt horizon has color hue of 7.5YR or 2.5Y, value of 4 to 6, and chroma of 2 to 6. It is silt loam or loam. The 2C horizon has hue of 7.5YR to 5Y, value of 4 to 6, and chroma of 1 to 6.

Cohoctah Series

The Cohoctah series consists of nearly level, dark colored soils that are very poorly drained. These soils formed in alluvium on the flood plain along Dry Creek in the northern part of Liberty Township. They are flooded during periods of high water. Flooding occurs mainly during winter, but it also occurs at other times of the year.

In a representative profile of a Cohoctah soil that is cultivated, the plow layer is very dark gray fine sandy loam about 11 Inches thick. The subsoil, between depths of 11 and 44 inches, is gray or dark gray fine sandy loam. Grayish brown and gray mottles indicate that the soil is seasonally saturated. The underlying material, below a depth of 44 inches, consists of strata of loamy sand and sand.

Cohoctah soils have moderately rapid permeability. They are saturated during winter and spring. They have a deep root zone in summer when the water table is low and in drained areas. Cohoctah soils have medium available moisture capacity and are mostly neutral to mildly alkaline in the root zone.

Representative profile of Cohoctah fine sandy loam, in a cultivated field in Liberty Township (SE¼SE¼SW¼NE¼ sec.23,T.6N.,R.7E.):

Ap-0 to 11 inches, very dark gray (10YR 3/1) and very dark grayish brown (10YR 3/2 rubbed) fine sandy loam; weak medium subangular blocky structure parting to weak fine granular; friable; common roots; neutral; abrupt smooth boundary.

B21g-11 to 16 inches, gray (10YR 5/1) fine sandy loam; common medium distinct brown (7.5YR 4/2) mottles; weak thick platy structure parting to weak fine subangular blocky structure; friable; common roots; ped surfaces are dark gray (10YR 4/1) and have common medium distinct grayish brown (10YR 3/2) fillings in root channels; neutral; gradual wavy boundary.

B22g-16 to 27 inches, dark gray (10YR 4/1) fine sandy loam; common fine faint gray (5Y 5/1) and brown (7.5YR 4/2) mottles; weak coarse subangular blocky structure parting to weak fine subangular blocky structure; friable; few roots; thin strata of pale-brown (10YR 6/3) loamy sand at a depth of 23 to 24 inches; neutral; gradual wavy boundary.

B23g-27 to 37 inches, gray (10YR 5/1) fine sandy loam; common medium distinct light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable; few roots; ped surfaces are dark gray (10YR 4/1) and have common fine distinct light gray (10YR 6/1) and dark-brown (7.5YR 3/2) mottles; mildly alkaline; gradual wavy boundary.

B24g-87 to 44 inches, gray (10YR 5/1) fine sandy loam; common medium distinct grayish brown (2.5Y 5/2) and dark yellowish brown (10YR 4/4) mottles; weak medium subangular blocky structure; friable; few roots; ped surfaces are dark gray (10YR 4/1) and have common medium distinct, gray (N 5/0) mottles and dark brown (7.5YR 3/2) oxide stains; mildly alkaline; abrupt wavy boundary.

C1g-44 to 62 inches, gray (N 5/0) loamy sand; common fine faint light olive brown (2.5Y 5/4) mottles and few medium distinct yellowish brown (10YR 5/6) mottles; single grain; very friable; mildly alkaline; clear smooth boundary.

C2g-62 to 71 inches, gray (10YR 5/1) sand; common medium distinct grayish brown (2.5 Y 5/2) mottles; single grain; loose; mildly alkaline.

The thickness of the solum ranges from 34 to 56 inches, but it most commonly is 36 to 48 inches. The upper 1 or 2 feet of the C horizon generally is noncalcareous but in some places is slightly calcareous.

The dark colored Ap horizon is more than 10 inches thick and generally ranges from 10 to 12 inches in thickness. This horizon is commonly very dark gray (10YR 3/1), but it is very dark grayish brown (10YR 3/2) and very dark brown (10YR 2/2) in places. The Ap horizon is fine sandy loam or loam. It contains a significant content of very fine sand.

The B horizon is gray (10YR 5/1) and dark gray (10YR 4/1) mottled with brown (10YR 4/3 or 7.5YR 4/2), light brownish gray (10YR 6/2 or 2.5Y 6/2), and grayish brown (2.5Y 5/2). The B horizon is fine sandy loam that has some lenses of slightly finer texture.

Colors in the C horizon have a hue of 10YR, value of 4 or 5, and chroma of 1 or 2. The C horizon is loamy sand to sand. Layers or lenses of loamy fine sand and light fine sandy loam occur in some places.

Cohoctah soils are similar to Gilford soils, but they formed in areas subject to flooding. They are coarser textured throughout than Sloan and Wabasha soils.

Colwood Series

The Colwood series consists of deep, nearly level, dark colored soils that are very poorly drained. These soils formed in loamy material that ,has a high content of silt and very fine sand. They are underlain by stratified silt and very fine sand. Colwood soils are in broad upland areas, mainly in Liberty Township.

In a representative profile of a Colwood soil that is cultivated, the plow layer is very dark grayish brown loam about 11 inches thick. The subsoil, between depths of 11 and 42 inches, is gray and contains many yellowish brown mottles. It is loam and light clay loam and has about the same content of clay as the surface layer. The underlying material, between depths of 42 inches and 65 inches or more, is calcareous, stratified silt and fine sand.

Colwood soils have moderate permeability in both the subsoil and the underlying stratified material. They are saturated for long periods in winter and early in spring. They have high available moisture capacity, and the root zone is deep where the soil is artificially drained or when the water table is low in summer.

Representative profile of Colwood loam, in a cultivated field in Liberty Township (SW¼SW¼SW¼SW¼ sec. 29, T. 6 N., R. 7 E.):

Ap-0 to 11 inches, very dark grayish brown (10YR 3/2) loam; weak fine subangular blocky structure parting to moderate medium granular; friable; many roots; neutral; gradual smooth boundary.

B21g-11 to 15 inches, gray (5Y 6/1) loam; many fine distinct light yellowish brown (10YR 6/4) and strong brown (7.5YR 5i6) mottles; weak medium angular blocky structure parting to moderate fine angular blocky; friable; many roots; many medium grayish brown (10YR 5/2) mottles on ped surfaces; neutral; clear smooth boundary.

B22g-15 to 22 inches, gray (5Y 6/1) loam; many fine distinct yellowish brown (10YR 5/6) mottles; weak medium prismatic structure parting to moderate medium angular blocky; common roots; friable; many medium grayish brown (2.5Y 5/2) mottles on ped surfaces; 2-inch grayish brown (10YR 5/2) krotovinas extending into the next lower horizon; neutral; clear smooth boundary.

B23g-22 to 31 inches, gray (5Y 6/1) light clay loam; many fine distinct yellowish brown (10YR 5/6) and strong brown (7.5YR 5/6) mottles: weak medium prismatic structure parting to moderate medium and coarse angular blocky; firm; few roots; many medium grayish brown (l0YR 5/2) krotovinas extending into next lower horizon; common to many earthworm casts; neutral; gradual smooth boundary.

B3g-31 to 42 inches, gray (5Y 6/1) loam; many fine and medium distinct yellowish brown (10YR 5/6) and strong brown (7.5YR 5/6) mottles; weak medium prismatic structure parting to weak medium and coarse subangular blocky; friable; few roots; many medium grayish brown (2.5Y 5/2) mottles on ped surfaces; mildly alkaline and a few calcareous zones; gradual wavy boundary.

C1g-42 to 48 inches, gray (5Y 6/1) loam; many coarse distinct light olive brown (2.5Y 5/4) and yellowish brown(10YR 5/6) mottles; massive but has some vertical cleavages; friable; common medium grayish brown (2.5Y 5/2) mottles on vertical cleavages; moderately alkaline; calcareous; gradual clear boundary.

C2-48 to 65 inches, yellowish brown (10YR 5/4), stratified silt loam very fine sand; many coarse gray (5Y 6/1) and light olive brown (2.5Y 5/4) mottles; weak medium and thick, platy structure; friable; moderately alkaline; calcareous.

The thickness of the solum. and commonly the depth to carbonates, ranges from 38 to 50 inches. In some places several inches of the upper part of the C horizon are mildly alkaline and noncalcareous.

The dark colored Ap horizon is more than 10 inches thick and generally ranges from 10 to 12 inches in thickness. It is commonly very dark grayish brown (10YR 3/2) but ranges to very dark gray (l0YR 3/1) and in some places to very dark brown (10YR 2/2). The texture is loam, fine sandy loam, or silt loam, but only loam and silt loam were mapped in this county.

The B horizon generally is commonly gray (10YR 5/1 or 5Y 5/1 or 51: 6/1) but ranges to grayish brown (10YR 5/2) and light brownish gray (10YR 6/2). Mottling is distinct, yellowish brown (10YR 5/4 and 10YR 5/6), grayish brown (2.5Y 5/2), pale brown (10YR 6/3), light yellowish brown (10YR 6/4), and strong brown (7.5YR 5/6), The B horizon is commonly loam, but it is fine sandy loam, light silty clay loom, or silt loom in some places.

The C horizon is commonly gray (10YR 6/1) or grayish brown (10YR 5/2), but it ranges to yellowish brown (10YR 5/4 and 10YR 5/6), light yellowish brown (10YR 6/4), or gray (5Y (6/1) in some places. The C horizon is silt, silt loom, and fine or very fine sand.

Colwood soils are the very poorly drained members of a drainage sequence that includes the moderately well drained Tuscola soils and the somewhat poorly drained Kibbie soils. They are adjacent to those soils in some areas. They are commonly adjacent to Lenawee soils, but they are less clayey in the B horizon than those soils. In contrast to the very poorly drained Mermill soils, the Colwood soils lack a B horizon of clay accumulation. They lack the medium and coarse sand content that is characteristic in Gilford and Granby soils. Colwood soils contain more silt and fine sand and lack a Bt horizon in contrast to Millgrove soils.

Del Rey Series

The Del Rey series consists of nearly level, deep, somewhat poorly drained soils. These soils formed in medium textured and moderately fine textured lacustrine sediment. They are on uplands, mainly in the southern part of Liberty Township and the northern part of Flatrock and Harrison Townships.

In a representative profile of a Del Rey soil that is cultivated, the plow layer is dark grayish-brown silt loam about 9 inches thick. The subsoil, between depths of 9 and 34 inches, is yellowish brown, dark yellowish brown, light brownish gray, and gray silty clay loam. It is more firm and has a higher content of clay than the surface layer. The underlying material, between depths of 34 and 60 inches, consists of layers of silty clay loam, silt loam, and clay loam.

Del Rey soils have slow permeability in the subsoil and in the underlying stratified material. They are saturated for significant periods in winter and spring. Artificial drainage helps to lower the water table, and this allows the soils to dry out and warm up earlier in spring. Del Rey soils have high available moisture capacity and a root zone that is deep where the soil is drained or when the water table is low in summer. They are medium acid or strongly acid within the upper 24 inches.

Representative profile of Del Rey silt loam, 0 to 2 percent slopes in a cultivated field in Liberty Township (NE¼NE¼NE¼SW¼ sec. 7, T. 5 N., R. 7 E.):

Ap1-0 to 6 inches, dark grayish-brown (10YR 4/2) silt loam; weak coarse subangular blocky structure parting to moderate medium granular; friable; common roots; slightly acid; abrupt smooth boundary.

Ap2-6 to 9 inches, dark grayish brown (10YR 4/2) silt loam; moderate thick platy structure parting to weak thin platy; friable; common roots; few fine distinct dark brown (7.5YR 4/4) iron stains on horizontal surfaces of plates; slightly acid; abrupt smooth boundary.

B1tg-9 to 13 inches, yellowish brown (10YR 5/6) silty clay loam; common fine faint light brownish gray (2.5Y 6/2) and light olive gray (5Y 6/2) mottles; moderate thick platy structure in upper 2 inches, moderate fine angular blocky below; firm; common roots; few fine distinct dark brown (7.5YR 4/4) iron stains on horizontal surfaces of plates; thin patchy brown(10YR 5/3) silt coatings and thin patchy clay films on peds; medium acid; clear smooth boundary.

B2tg-13 to 25 inches, dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/4) silty clay loam; common fine distinct light olive gray (5Y 6/2) and light brownish gray (2.5Y 6/2) mottles; moderate coarse subangular blocky structure parting to moderate, medium angular blocky; firm; common roots; thin continuous, grayish brown (2,5Y 5/2) clay films on vertical ped surfaces, patchy on horizontal faces; common fine black (5YR 2/1) oxide concretions; neutral; clear wavy boundary.

B3tg-25 to 34 inches, light brownish gray (2.5Y 6/2) and gray (5Y 6/1) silty clay loam; many medium distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; few roots; thin very patchy grayish brown (2.5Y 5/2) clay films on vertical ped surfaces; common light brownish gray (10YR 6/2) ped coatings; mildly alkaline; abrupt smooth boundary.

C1g-34 to 42 inches, light brownish gray (2.5Y 6/2) and gray (5Y 6/1) silty clay loam; many medium distinct yellowish brown (10YR 5/6) mottles; weak fine subangular blocky structure; firm; few grayish brown (2,5Y 5/2) clay films in old root channels; moderately alkaline; calcareous; gradual wavy boundary.

C2-42 to 60 inches, brown (10YR 5/3), stratified silty clay loam, clay loam, and silt loam; weak medium and thick platy structure; firm; thin horizontal layers, 2 to 5 millimeters thick, highly mottled with pinkish gray (5YR 7/2), light gray (10YR 7/2), and light greenish gray (5YR 7/1) occur every 3 to 5 inches; moderately alkaline; calcareous.

The thickness of the solum, and commonly the depth to carbonates, ranges from 28 to 44 inches, In some places the solum extends several inches into the calcareous horizon.

The Ap horizon is commonly 8 inches thick, but its thickness ranges from 6 to 10 inches. The colors generally are dark grayish brown (10YR 4/2), but they are grayish brown (10YR 5/2) or dark gray (10YR 4/1) in places. The A horizon is silt loam or loam. An A2 horizon occurs in undisturbed soils.

The B horizon generally is dark yellowish brown (10YR 4/4), brown (l0YR 4/3), and grayish brown (10YR 5/2), but it ranges to yellowish brown (10YR 5/4, 5/6) and gray (10YR 6/1). Hues of 2.5Y and 5Y, a value of 6, and a chroma of 1 or 2 are not uncommon in the lower part of the B horizon. Mottling is distinct, light brownish gray (2.5Y 6/2), light olive gray (5Y 6/2), and yellowish brown (10YR 5/4, 5/6). Ped coatings generally are darker; they are grayish brown or dark grayish brown. The B horizon generally is silty clay loam or silty clay, but thin layers of fine sand occur in some places.

The C horizon commonly is light brownish gray (2.5Y 6/2), gray (5Y 6/1), grayish brown (10YR 5/2), or brown (10YR 5,/3), but it ranges to dark grayish brown (10YR 4/2) or brown (10YR 4/3). The texture is silty clay loam and clay loam. Thin layers of silt loam and fine sand occur in some places.

Del Rey soils are the somewhat poorly drained members of a drainage sequence that includes the very poorly drained Lenawee soils. They are adjacent to those darker colored soils in many places. The Del Rey soils have a higher content of clay in the B and C horizons than the Kibbie soils. They are similar to Fulton and Nappanee soils, but they have a higher content of sand in the B horizon than Fulton soils and a lower content of clay in the B horizon than Nappanee soils.

Digby Series

The Digby series consists of deep, nearly level, somewhat poorly drained soils in areas on uplands, mainly in the northern part of the county. These soils formed in loamy material on beach ridges, outwash plains, and stream terraces.

In a representative profile of a Digby soil that is cultivated, the plow layer is dark grayish brown fine sandy loam about 9 inches thick. The upper part of the subsoil, between depths of 9 and 32 inches, is dark yellowish brown sandy clay loam. It has a higher content of clay than the surface layer. The lower part of the subsoil, between depths of 32 and 37 inches, is dark-brown sandy clay loam. The underlying material, between depths of 37 and 50 inches, is calcareous sand and gravel.

Digby soils have moderate permeability in the subsoil and rapid permeability in the underlying sand and gravel. They have a seasonally high water table and medium available moisture capacity. The root zone is deep in summer when ,the water table is low, and it is slightly acid to strongly acid.

Representative profile of Digby fine sandy loam, 0 to 2 percent slopes, in a cultivated field in Napoleon Township (sec.24,T.5N.,R.6E.):

Ap-0 to 9 inches, dark grayish brown (10YR 4/2) fine sandy loam; weak fine subangular blocky structure parting to moderate fine granular; friable; many roots; common fine pebbles; slightly acid; clear smooth boundary.

B1-9 to 18 inches, dark yellowish brown (10YR 4/4) light sandy clay loam; common faint yellowish brown (10YR 5/6), light olive brown (2.5YR 5/4), and dark brown (7.5YR 4/4) mottles; weak medium subangular blocky structure parting to weak fine subangular blocky structure; friable; many roots; common fine pebbles; dark grayish brown (10YR 4/2) coatings on root channels and earthworm channels; many medium grayish brown (10YR 5/2) mottles on ped faces; slightly acid; abrupt smooth boundary.

B21t-18 to 23 inches, dark yellowish brown (10YR 4/4) sandy clay loam; common fine distinct light olive brown (2.5Y 5/4) and yellowish brown (10YR 5/6) mottles; moderate coarse angular blocky structure parting to moderate medium and fine subangular blocky; firm; few roots; thin continuous, grayish brown (10YR 5/2) clay films on peds; common fine pebbles; neutral; clear wavy boundary.

B22t-23 to 32 inches, dark yellowish brown (10YR 4/4) sandy clay loam; many fine distinct grayish brown (2.5Y 5/2), light brownish gray (10YR 6/2), and yellowish brown (10YR 5/6) mottles; moderate coarse subangular blocky structure; friable; few roots; common fine pebbles; continuous, grayish brown (10YR 5/2) ped coatings; thin patchy clay films, mostly on vertical ped surfaces; few black (N 2/0) oxide concretions; moderately alkaline; gradual wavy boundary.

B3-32 to 37 inches, dark-brown (10YR 4/3) sandy clay loam; many fine distinct yellowish brown (10YR 5/6) and light brownish gray (2.5Y 6/2) mottles; weak fine subangular blocky structure; friable; few roots; few small shells; thin very patchy brown (10YR 5/3) clay films, mostly on vertical ped surfaces; moderately alkaline; calcareous; abrupt smooth boundary.

IIC-37 to 50 inches, yellowish brown (10YR 5/4) sand and gravel; many fine distinct yellowish brown (10YR 5/6) and grayish brown (2.5Y 5/2) mottles; single grain; loose; matrix color is olive gray (5Y 5/2) below a depth of 44 inches; moderately alkaline; calcareous.

The thickness of the solum, and commonly the depth to carbonates, ranges from 25 to 40 inches. In some places the lower few inches of the solum is calcareous. The content of gravel in the solum ranges from 2 to 20 percent. Digby soils that contain pebbles or gravel occur mainly on the beach ridges or on stream terraces. The soils on outwash plains or along tributaries commonly contain little or no gravel.

The Ap horizon is commonly 8 inches thick, but its thickness ranges from 7 to 11 inches. The horizon generally is dark grayish brown (10YR 4/2) or dark gray (10YR 4/1). An A2 horizon is present in some places. The B horizon generally is yellowish brown (10YR 5/4) and dark yellowish brown (10YR 4/4), but it ranges to dark brown (10YR 4/3)and grayish brown (10YR 5/2). A chroma of 2 is dominant on ped faces. The B horizon is loam, sandy clay loam, or clay loam, but fine sandy loam commonly occurs in individual subhorizons. Some areas of Digby soils contain ½ to 1-inch seams of silty clay.

The C horizon is commonly grayish brown (10YR 5/2), light brownish gray (10YR 6/2), or yellowish brown (10YR 5/4). It generally is moderately alkaline and calcareous. The C horizon is sandy or gravelly and contains variable amounts of finer material. Contrasting finer textured lacustrine or till material is at a depth below 40 inches.

Digby soils are the somewhat poorly drained members of a drainage sequence that includes the moderately well drained Haney soils and the very poorly drained Millgrove soils. They are commonly adjacent to dark colored, very poorly drained Millgrove, Mermill, and Hoytville soils. They are adjacent to Haney soils on beach ridges and on stream terraces. The Digby soils differ from Haskins soils by lacking a finer-textured, underlying C horizon within a depth of 40 inches. They have a lower content of fine sand and silt in the B and C horizon than somewhat poorly drained Kibbie soils.

Eel Series

Depth class: Very deep; moderately deep or deep in the bedrock substratum phase
Drainage class: Moderately well drained
Permeability: Moderate in the solum, and moderate or moderately rapid in the substratum
Parent material: Loamy alluvium; and in the moderately deep to bedrock substratum phase, loamy alluvium overlying limestone or dolostone
Landform: Flats, rises, and natural levees on flood plains
Slope: 0 to 2 percent

Adjacent soils: Genesee, Shoals, Sloan

Taxonomic class: Fine-loamy, mixed, superactive, mesic Fluvaquentic Eutrudepts

Typical Pedon
Eel silt loam, occasionally flooded, in Lucas County, Ohio; Monclova Township; about 1 mile southeast of Albon Lake; about 600 feet north and 900 feet east of the center of sec. 33, T. 2.

Ap–0 to 9 inches; dark grayish brown (10YR 4/2) loam; weak medium granular structure; friable; common fine roots; neutral; abrupt smooth boundary.

Bw1–9 to 16 inches; brown (10YR 4/3) loam; weak medium subangular blocky structure; friable; few fine roots; neutral; abrupt wavy boundary.

Bw2–16 to 22 inches; yellowish brown (10YR 5/4) loam; weak medium subangular blocky structure; friable; few fine roots; few fine distinct brown grayish brown (10YR 5/2) iron depletions in the matrix; few fine faint brown (10YR 4/3) masses of iron accumulation in the matrix; neutral; gradual wavy boundary.

BC–22 to 33 inches; dark yellowish brown (10YR 4/4) loam; weak medium subangular blocky structure; friable; few fine roots; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; neutral; abrupt smooth boundary.

C–33 to 60 inches; brown (10YR 4/3) sandy loam with strata of loamy sand; massive; friable; common medium faint dark grayish brown (10YR 4/2) iron depletions in the matrix; strongly effervescent; moderately alkaline.

Range in Characteristics
Thickness of the solum: 20 to 40 inches
Depth to carbonates: 20 to 40 inches
Depth to bedrock: More than 48 inches, but typically more than 60 inches; 20 to 42 inches in the bedrock substratum phase

Ap or A horizon:
Color=hue of 10YR, value of 3 to 5, chroma of 2 or 3
Texture=silt loam or loam
Content of rock fragments=0 to 5 percent

Bw or Bg horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 1 to 6
Texture=loam, silt loam, or clay loam
Content of rock fragments=0 to 5 percent

C or Cg horizon:
Color=hue of 10YR, value of 4 to 6, chroma of 1 to 4
Texture=sandy loam, fine sandy loam, or loam, with strata of loamy sand, sandy loam, silt loam, silty clay loam, clay loam, loamy fine sand, fine sand, or sand
Content of rock fragments=0 to 14 percent

Fulton Series

The Fulton series consists of deep, nearly level to gently sloping, somewhat poorly drained soils on uplands. These soils formed in lacustrine material that has a high content of clay.

In a representative profile of a Fulton soil in a pasture, the surface layer is dark grayish brown silty clay loam about 4 inches thick. Between depths of 4 and 9 inches is a layer of brown silty clay loam. The subsoil, between depths of 9 and

32 inches, is dark grayish brown and dark brown silty clay that is mottled with dark yellowish brown, yellowish brown, and light brownish gray. The underlying material, to a depth of 60 inches, consists of strata of calcareous silty clay, clay, and silt.

Fulton soils have slow permeability and medium available moisture capacity. They are saturated for significant periods in winter and spring and dry out slowly unless they have been artificially drained. The root zone is deep in summer when the water table is low but root growth may be restricted in the clayey subsoil. The upper 24 inches is medium acid to neutral.

Representative profile of Fulton silty clay loam, 0 to 2 percent slopes, in a permanent pasture in Washington Township (SE¼SW¼SE¼NE¼ sec. 6, T. 5 N., R. 8E.) :

A1-0 to 4 inches, dark grayish brown (10YR 4/2) silty clay loam; moderate fine granular structure; firm; many roots; neutral; clear wavy boundary.

A2-4 to 9 inches, brown (10YR 4/3) silty clay loam; common medium faint light brownish gray (10YR 6/2) and yellowish brown (10YR 5/6) mottles; weak fine subangular blocky structure; firm; few roots; slightly acid; gradual wavy boundary.

B21tg-9 to 12 inches, dark grayish brown (10YR 4/2) silty clay; common medium faint dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/6) mottles; dominant ped coatings of dark grayish brown (10YR 4/2); moderate medium and fine angular blocky structure; very firm; few roots; thin patchy dark gray (10YR 4/1) clay films on peds; neutral; gradual smooth boundary.

B22tg-12 to 24 inches, dark-brown (10YR 4/3) silty clay; few medium faint yellowish brown (10YR 5/6) mottles; ped surfaces are dominantly dark grayish brown (10YR 4/2); strong medium angular blocky structure; very firm; few roots; thin patchy dark gray (10YR 4/1) clay films on peds; few very dark gray (10YR 3/1) organic coatings; neutral; gradual smooth boundary.

B23tg-24 to 32 inches, dark grayish brown (10YR 4/2) silty clay; few medium faint light brownish gray (10YR 6/2) and yellowish brown (10YR 5/6) mottles; strong medium angular blocky structure; very firm; thin patchy dark gray (10YR 4/1) clay films on peds; neutral; gradual wavy boundary.

C1g-82 to 36 inches, grayish brown (10YR 5/2), stratified clay and silt; many medium faint yellowish brown (10YR 5/6) mottles; weak thin and medium platy structure; very firm; few thin dark grayish brown (10YR 4/2) clay films on vertical ped surfaces; mildly alkaline; gradual irregular boundary.

C2g-86 to 60 inches, yellowish brown (10YR 5/6), stratified silty clay and silt; few fine distinct grayish brown (2.5Y 5/2), 10YR (5/2) and greenish gray (5GY 6/1) mottles; weak thin and medium platy structure; very firm; white (N 8/0) calcium accumulations; moderately alkaline; calcareous.

The thickness of the solum, and commonly the depth to carbonates, ranges from 28 to 45 inches. In some places the solum extends several inches into the calcareous horizon.

The Ap horizon is commonly 8 inches thick, but its thickness range from 7 to 10 inches. This horizon generally is dark grayish brown (10YR 4/2) or grayish brown (10YR 5/2). In uncultivated soils there is an Al horizon that ranges from 2 to 4 inches in thickness and from very dark grayish brown (10YR 3/2) to dark grayish brown (10YR 4/2) in color. The A horizon is silty clay loam, silt loam, or loam. An A2 horizon of brown (10YR 4/3 or 5/3) loam or silty clay loam is present in uncultivated soils. This horizon is thin or is absent if the soil has been cultivated.

The matrix colors of the B horizon generally are brown(10YR 4/3), but they range to yellowish brown (10YR 5/4), dark grayish brown (10YR 4/2), or grayish brown (10YR 5/2). Mottling is distinct, dark yellowish brown (10YR 4/4), yellowish brown (10YR 5/4), and light brownish gray (10YR 6/2). Ped coatings are dark grayish brown or dark gray, but they dominantly have a chroma of 2 or less. Clay films typically are thin and patchy, but they range to thin and continuous. The texture of the B horizon is silty clay or clay. In some places thin layers of stratified silty clay loam or silt loam occur, mainly in the lower part of the B horizon.

The C horizon is grayish brown (10YR 5/2) or dark grayish brown (10YR 4/2) in the upper part, but with increasing depth it ranges to dark yellowish brown (10YR 4/4) or yellowish brown (10YR 5/4 or 5/6). The C horizon is stratified silty clay, silt loam, silt, and fine sand. These thin layers of contrasting textures are commonly 1/8 to 1 inch thick, but thicker layers occur in some places.

Fulton soils are the somewhat poorly drained members of a drainage sequence that includes the moderately well drained Lucas soils and the very poorly drained Toledo sails. They commonly are adjacent to soils of both of these series. They are adjacent to somewhat poorly drained Del Rey soils in some places, especially in Liberty Township. The Fulton soils have a more clayey Bt horizon than the Del Rey soils. They have a lower content of sand and contain fewer coarse fragments than somewhat poorly drained Nappanee soils, and they have a lower content of clay than somewhat poorly drained Roselms soils.

Fulton Series, Sandy Subsoil Variant

Soils of the Fulton series, sandy subsoil variant, have sandy and gravelly material within a depth of 40 inches, whereas normal Fulton soils are clayey to a depth of more than 40 inches. The soils of this variant are somewhat poorly drained and most commonly are on uplands adjacent to South Turkeyfoot Creek.

In a representative profile of a Fulton, sandy subsoil variant, soil that is cultivated, the plow layer is dark gray loam about 9 inches thick. The subsoil, between depths of 9 and 33 inches, is grayish brown clay and brown clay loam and is mottled with dark brown and dark yellowish brown. It is more clayey than the surface layer. Between depths of 33 and 37 inches, the subsoil is yellowish brown sandy loam. The underlying material, to a depth of 64 inches or more, consists of silt loam, coarse sand, and stratified, calcareous silty clay, silty clay loam, and coarse sand. The movement of water through the profile is restricted by the clayey layers, but the soil drains slightly more rapidly than normal Fulton soils. The sandy lower part of the subsoil and the substratum commonly provide natural drainage to a slope break.

Fulton, sandy subsoil variant, soils have slow permeability in the clayey subsoil and moderate to rapid permeability in the more sandy part of the subsoil and the substratum. They are saturated for significant periods in winter and spring, but the periods are not quite so long as is typical for normal Fulton soils. They dry out rather slowly in spring unless they are artificially drained. They have medium available moisture capacity and a root zone that is deep in adequately drained areas or in summer.

Representative profile of Fulton loam, sandy subsoil variant, 0 to 2 percent slopes, in a cultivated field in Monroe Township (SE¼NE¼SE¼NE¼ sec. 6, T. 4 N., R.7E.):

Ap-0 to 9 inches, dark gray (10YR 4/1) loam; weak fine subangular blocky structure parting to moderate medium granular; friable; some mixing of B horizon into this horizon; neutral; abrupt smooth boundary.

B21tg-9 to 15 inches, grayish brown (10YR 5/2) clay; common fine faint dark brown (10YR 4/3) mottles; moderate medium angular blocky structure; firm; thin patchy dark grayish brown (10YR 4/2) clay films around peds; common dark reddish brown (5YR 3/2) oxide concretions ; neutral; clear wavy boundary.

B22tg-15 to 24 inches, grayish brown (10YR 5/2) clay; common medium distinct dark yellowish brown (10YR 4/4) mottles; moderate, medium, angular blocky structure; firm; thin patchy gray (10YR 5/1) clay films around peds; few dark reddish-brown (5YR 3/2) oxide concretions; neutral; clear wavy boundary.

B23tg-24 to 33 inches, brown (10YR 5/3) clay loam; common fine distinct dark yellowish brown (10YR 4/4) mottles; moderate medium subangular blocky structure; friable; thin patchy gray (10YR 5/1) clay films on vertical ped faces; few dark reddish brown (5YR 3/2) oxide concretions; mildly alkaline; abrupt smooth boundary.

IIB3g-33 to 37 inches, yellowish brown (10 YR 5/4) sandy loam; common fine faint light brownish gray (10YR 6/2) and grayish brown (10YR 5/2) mottles; weak medium subangular blocky structure; very friable; mildly alkaline; weakly calcareous; clear wavy boundary.

IIIClg-37 to 44 inches, olive gray (5Y 5/2) silt loam; very weak fine subangular blocky structure; friable; some light gray (5Y 6/1) calcium accumulation; moderately alkaline: calcareous; clear wavy boundary.

IVC2-44 to 57 inches, dark yellowish brown (10YR 4/4) coarse sand; common fine faint brown (10YR 5/3) mottles; single grain; loose; moderately alkaline; calcareous; abrupt smooth boundary.

VC3-57 to 64 inches, gray (10YR 5/1) strata of silty clay, silty clay loam, and coarse sand; moderate thick platy structure; friable and loose; moderately alkaline; calcareous.

The thickness of the solum, and generally the depth to carbonates, ranges from 28 inches to about 44 inches but commonly is 32 to 42 inches. In some places the upper 1 foot of the substratum is only mildly alkaline. The thickness of the stratified sandy subsoil and substratum ranges from about 1 foot to 4 to 6 feet in some places. Sandy strata are typically within a depth of 40 inches. The substratum typically is coarse and medium sand, gravelly loamy sand, or gravelly sandy loam, but in some places layers of silt loam, sandy loam, and silty clay loam occur within the coarse-textured substratum. Fine-textured lacustrine clay or glacial clay till underlies the sandy substratum layer.

Fulton, sandy subsoil variant, soils are adjacent to normal Fulton soils and to Lucas soils. They are not so well drained as the Lucas soils, which are on slope breaks.

Galen Series

The Galen series consists of deep, nearly level to gently sloping, moderately well drained soils. These soils formed in thick deposits of fine sand. They are on crests and slopes of knolls and ridges on the lake plain, mainly in the northeastern part of the county.

In a representative profile of a Galen soil that is cultivated, the plow layer is dark grayish brown fine sand about 10 inches thick. The subsurface layer, between depths of 10 inches and 28 inches, is yellowish brown fine sand. The lower 8 inches of the subsurface layer has faint yellowish brown and light brownish gray mottles. Between depths of 28 inches and 92 inches or more there are layers of fine sand, fine sandy loam, and loamy fine sand. The loamy fine sand and fine sandy loam layers contain slightly more clay than the adjacent fine sand layers. These layers or bands have a darker or stronger color than the less clayey layers. The combined thickness of bands that have clay accumulations is more than 6 inches.

Galen soils have moderately rapid permeability, low available moisture capacity, and a deep root zone. They are medium acid or strongly acid within the upper 24 inches. During windy periods they are affected by soil blowing if they lack a thick plant cover.

Representative profile of Galen fine sand, 2 to 6 percent slopes, in a cultivated field in Liberty Township (SE¼NE¼NE¼NE¼ sec. 14, T. 6N., R.7 E.):

Ap-0 to 10 inches, dark grayish brown (10YR 4/2) fine sand; weak fine granular structure; very friable; many roots; slight mixing of A2 horizon into Ap horizon in some places; slightly acid; abrupt smooth boundary.

A21-10 to 20 inches, yellowish brown (10YR 5/6) fine sand; single grain; soft; common roots; few medium yellowish red (5YR 4/8) oxide nodules; medium acid; gradual smooth boundary.

A22-20 to 28 inches, yellowish brown (10YR 5/4) fine sand; common fine faint yellowish brown (10YR 5/6) mottles and few light brownish gray (2.5Y 6/2) mottles; common roots; mottling is more noticeable near bottom of horizon; single grain; soft; very few fine pebbles; medium acid; abrupt wavy boundary.

B21t-28 to 40 inches, strong brown (7.5YR 5/6) fine sandy loam; common fine faint yellowish brown (10YR 5/6) mottles; weak coarse subangular blocky structure; firm; common roots; thin patchy brown (7.5 4/4) clay films on vertical ped faces, and reddish brown (5YR 4/4) in root channels; few dark reddish brown (5YR 2/2) oxide concretions; mildly alkaline; abrupt wavy boundary.

A23-40 to 47 inches, brown (10YR 5/3) fine sand; common medium light yellowish brown (2.5Y 6/4) mottles, faint yellowish brown (10YR 5/6) mottles, and distinct light brownish gray (2.5Y 6/2) mottles; single grain; loose; common roots; slightly acid; clear wavy boundary.

A24 & B22t-47 to 54 inches, pale brown (10YR 6/3) fine sand; many medium faint light yellowish brown (2.5Y 6/4) and light brownish gray (2.5Y 6/2) mottles and common fine brown (10YR 5/3) mottles; single grain; loose; thin bands of dark brown (7.5YR 4/4) loamy fine sand; weak medium subangular blocky structure; friable; thin patchy brown (7.5YR 4/2) clay films on vertical ped faces; few roots; slightly acid; clear wavy boundary.

A25-54 to 71 inches, pale brown (10YR 6/3) fine sand; common fine distinct yellowish brown (10YR 5/6) and brown (10YR 5/3) mottles; single grain; slightly acid; abrupt wavy boundary.

B23t-71 to 79 inches, dark brown (7.5YR 4/4) loamy fine sand; weak medium subangular blocky structure; friable; neutral; abrupt wavy boundary.

A26-79 to 92 inches, brown (10YR 5/3) fine sand; common medium faint light brownish gray (2.5Y 6/2) mottles; single grain; loose; neutral.

The thickness of the solum, and commonly the depth to carbonates, ranges from about 40 to 92 inches. In some places the depth to carbonates is 1 foot to 2 feet below the solum.

The Ap horizon is 3 to 10 inches in thickness, depending on the soil loss through soil blowing. The Ap horizon generally is dark grayish brown (10YR 4/2.) or brown (10YR 4/3).

The A2 horizon is light yellowish brown (10YR 6/4), yellowish brown (10YR 5/6 or 5/4), brown (10YR 5/3), pale brown (10YR 6/3), and, in some places, brownish yellow (10YR 6/6). The A2 horizon is mottled with faint, yellowish brown (10YR 5/6), light brownish gray (2.5Y 6/2), light yellowish-brown (2.5Y 6/4), and brown (10YR 5/3) mottles.

The Bt horizon generally is strong brown (7.5YR 5/6) or dark brown (7.5YR 4/4). The dominant texture is fine sandy loam, but in some places it is loamy fine sand or light sandy loam. The Bt horizon is either one continuous layer that ranges from 8 to about 28 inches in thickness, or it consists of bands of variable thickness that have a combined thickness of more than 6 inches.

The C horizon (not described) is commonly light brownish gray (2.5Y 6/2), pale brown (10YR 6/3), or gray (10YR 5/1 or 6/1). The tenure generally is fine sand, but layers of loamy fine sand, loamy sand, and medium sand occur in some places.

Galen soils are the moderately well drained members of a drainage sequence that includes well drained Arkport soils. They are adjacent to Arkport soils in many places. They are commonly adjacent to somewhat poorly drained Tedrow and very poorly drained Granby soils. In some places Galen soils are adjacent to the well drained Spinks and Oakville soils and the moderately well drained Ottokee soils. Galen soils have a Bt horizon that Oakville soils lack. They have a higher content of clay in the Bt horizon than Spinks and Ottokee soils. Galen soils lack the finer textured, contrasting lower part of the solum of the moderately well drained Seward soils.

Genesee Series

The Genesee series consists of deep, nearly level, well drained soils. These soils formed in alluvial material along the Maumee River and the major creeks near the river. They are flooded during periods of high water. This flooding occurs mainly in winter, but it can occur any time of the year.

In a representative profile of a Genesee soil that is cultivated, the plow layer is dark grayish brown loam about 8 inches thick. The subsoil, between depths of 8 and 20 inches, is brown or dark grayish brown loam that is similar to the surface layer. The lower part of the subsoil, to a depth of 28 inches, is brown silt loam. The underlying material, to a depth of 52 inches or more, is calcareous silt loam.

Genesee soils are moderately permeable throughout. They have a deep root zone and high available moisture capacity. They are mildly alkaline in the root zone.

Representative profile of Genesee loam, in a cultivated field in Liberty Township (NE¼SE¼NW¼SW¼ sec. 35, T.6N.,R.7E.):

Ap-0 to 8 inches, dark grayish brown (10YR 4/2) loam; weak fine granular structure; friable; common roots; mildly alkaline; abrupt smooth boundary.

B21-8 to 13 inches, dark grayish brown (10YR 4/2) loam; weak coarse angular blocky structure; friable; few roots; very dark grayish brown (10YR 3/2) coatings on some ped surfaces; mildly alkaline; abrupt smooth boundary.

B22-13 to 20 inches, brown (10YR 5/3) loam; weak medium platy structure; friable; few roots; very dark grayish brown (10YR 3/2) coatings on some ped surfaces; mildly alkaline; abrupt smooth boundary.

B23-20 to 28 inches, brown (10YR 4/3) silt loam; weak fine angular blocky structure; friable; few roots; dark grayish brown (10YR 4/2) coatings on horizontal ped surfaces; brown (10YR 5/3) sand on surfaces of root and worm channels; mildly alkaline; clear wavy boundary.

C-28 to 52 inches, brown (10YR 5/3) silt loam; common fine and medium distinct grayish brown (2.5Y 5/2) and gray (N 5/0) mottles; weak medium angular blocky structure; friable; few roots; few dark grayish brown (10YR 4/2) coatings on vertical faces of peds; common fine distinct dark brown (7.5YR 4/4) iron stains increasing with depth; moderately alkaline; calcareous.

The thickness of the solum, and commonly the depth to carbonates, ranges from 24 to 40 inches but typically is 24 to 36 inches.

The Ap horizon commonly is 8 inches thick, but is thickness ranges from 7 to 11 inches. This horizon generally is dark grayish brown (10YR 4/2) or brown (10YR 4/3 or 5/3).

The B horizon is brown (10YR 4/3 or 5/3), dark yellowish brown (10YR 4/4), dark grayish brown (10YR 4/2), or yellowish brown (10YR 5/4). Organic coatings on ped surfaces are very dark grayish brown (10YR 3/2) or dark grayish brown (10YR 4/2). The texture of the B horizon generally is silt loam or loam, but strata of sand occur in some places.

The C horizon typically is dark yellowish brown (10YR 4/4) or brown (10YR 4/3 or 5/3). Its texture is silt loam, loam, or light silty clay loam. Some stratification occurs in some places, and sandy layers are not uncommon.

Genesee soils are the well drained members of a drainage sequence that includes the somewhat poorly drained Shoals soils and the very poorly drained Sloan soils. They are adjacent to those soils in many places. Along the Maumee River, Genesee soils are commonly adjacent to the darker colored, moderately well drained Medway soils and the darker colored, well drained Ross soils.

Gilford Series

The Gilford series consist of nearly level, dark colored, very poorly drained soils in broad areas on the lake plain, principally in Harrison and Damascus Townships. These soils formed in thick loamy material underlain by calcareous loamy fine sand or fine sand.

In a representative profile of a Gilford soil that is cultivated, the plow layer is very dark gray fine sandy loam about 8 inches thick. Between depths of 8 inches and 12 inches is a layer of mottled, very dark grayish brown fine sandy loam. The subsoil is fine sandy loam that is grayish brown between depths of 12 and 24 inches and is light brownish gray between depths of 24 and 32 inches. The subsoil is mottled with yellowish brown, gray, and brownish yellow and has about the same content of clay as the surface layer. The underlying material, between depths of 32 and 60 inches, is grayish brown and brown calcareous loamy fine sand and fine sand.

Gilford soils have moderately rapid permeability. They have a high water table in winter and spring. They have medium available moisture capacity and a root zone that is deep when the water table is low in summer. The root zone mainly is neutral.

Representative profile of Gilford fine sandy loam, in a cultivated field in Damascus Township (NW1/4NW1/4NE1/4NW1/4 sec. 26, T. 5 N., R. 8 E.):

Ap-0 to 8 inches, very dark gray (10YR 3/1) fine sandy loam; moderate fine and medium subangular blocky structure; friable, slightly hard; many roots; neutral; abrupt smooth boundary.

A1-8 to 12 inches, very dark grayish brown (10YR 3/2) fine sandy loam; few fine distinct yellowish brown (10YR 5/6) and olive yellow (2.5Y 6/8) mottles in the lower part; weak medium and coarse subangular blocky structure; friable, slightly hard; common roots; some very dark

gray (10YR 3/1) organic stains; neutral; gradual wavy boundary.

B21g-12 to 24 inches, grayish brown (10YR 5/2) fine sandy loam; many medium distinct yellowish brown (10YR 5/6 and 5/8) mottles and few fine faint gray (10YR 5/1) mottles; weak medium prismatic structure parting to moderate medium angular blocky structure; friable, slightly hard; few roots; patchy coatings in root channels; neutral; clear wavy boundary.

B22g-24 to 32 inches, light brownish gray (10YR 6/2) fine sandy loam; many coarse distinct yellowish brown (10YR 6/6) mottles; moderate coarse angular blocky structure; friable slightly hard; few roots; neutral; clear wavy boundary.

C1g-32 to 36 inches, grayish-brown (10YR 5/2) loamy fine sand; many medium distinct yellowish brown (10YR 5/8) mottles and few fine distinct light olive brown (2.5Y 5/6) mottles; single grain; loose; some 3- to 10-inch pockets of pale brown (10YR 6/3) calcareous sand; mildly alkaline; clear wavy boundary.

C2-36 to 60 inches, brown (10YR 5/3) fine sand; single grain; loose; discontinuous bands of yellowish brown (10YR 5/4) silty clay loam to silty clay that has few fine faint mottles between depths of 40 and 44 inches; moderately alkaline; calcareous.

The thickness of the solum, and commonly the depth to carbonates, ranges from 26 to 40 inches but most commonly is 32 to 40 inches. In some places several inches of the sandy substratum is mildly alkaline and noncalcareous.

The dark-colored A horizon is thicker than 10 inches; its thickness generally ranges from 10 to 12 inches, but in some places is 14 inches. This horizon generally is very dark gray (10YR 3/1) or very dark grayish brown (10YR 3/2) but ranges to black (10YR 2/1) in some places.

The B horizon generally is grayish brown (10YR 5/2) or light brownish gray (10YR 6/2) but ranges to gray (10YR 5/1) or dark gray (10YR 4/1). Mottling is distinct and is mostly yellowish brown (10YR 5/6 and 5/8) but ranges to brownish yellow (10YR 6/6). A few gray (10YR 5/1) mottles occur on some ped surfaces. In some places the B-horizon mottling is subdued, and the matrix colors are dominantly gray. The B horizon is mainly fine sandy loam but has thin layers of loamy fine sand in some places. Discontinuous, ¼- to 1-inch clay bands occur in some places in the lower part of the B horizon.

The C horizon is commonly grayish brown (10YR 5/2), gray (10YR 5/1), or brown (10YR 5/3). This horizon is fine sand and loamy fine sand that has discontinuous, ½- to 2-inch clay bands occurring rather commonly. Underlying the sandy C horizon is fine-textured lacustrine or glacial till material. This material generally is at a depth of 5 to 10 feet, but in some places it is as shallow as 48 inches.

Gilford soils are adjacent to very poorly drained Millgrove, Granby, Wauseon, and Colwood soils. They are coarser textured throughout than the Colwood and Millgrove soils. They have a higher content of silt and clay than the Granby soils. Gilford soils are similar to Wauseon soils, but they lack the fine-textured C horizon within a depth of about 40 inches. They differ from Cohoctah soils by not being subject to flooding.

Granby Series

The Granby series consists of sandy, nearly level, dark colored soils that are very poorly drained. These soils formed in deep, neutral to lightly acid fine sand that is underlain by fine and medium sand. They are on broad areas on uplands, mainly in Washington and Liberty Townships.

In a representative profile of a Granby soil that is cultivated, the surface layer is black loamy fine sand about 14 inches thick. The subsoil, between depths of 14 and 36 inches is grayish brown loamy fine sand in the upper part and light brownish gray or gray sand in the lower part and is mottled. The content of clay in the subsoil is less than that in the surface layer, and it gradually decreases with increasing depth. The underlying material, between depths of 36 to 63 inches or more, is calcareous fine sand.

Granby soils have rapid permeability throughout but are seasonally saturated for long periods of time. They have low available moisture capacity and a root zone that is deep in summer when the water table is low or in drained areas. They are mostly neutral in the root zone.

Representative profile of Granby loamy fine sand, in a cultivated field in Washington Township (SE¼SW¼SW¼SW¼ sec. 24, T. 6 N., R. 8 E; laboratory data HN-89):

Ap-0 to 10 inches, black (N 2/0) loamy fine sand; weak fine to medium granular structure; very friable; many roots; slightly acid; abrupt smooth boundary.

A1-10 to 14 inches, black (N 2/0) loamy fine sand; very weak thin platy structure; very friable; many roots; neutral; gradual smooth boundary.

B2g-14 to 20 inches, grayish brown (2.5Y 5/2) loamy fine sand; few medium distinct olive brown (2.5Y 4/4) mottles; very weak coarse prismatic structure parting to very weak coarse subangular blocky; very friable; common roots; some black (10YR 2/1) organic staining on vertical ped surfaces; neutral; clear wavy boundary.

B31g-20 to 28 inches, light brownish gray (2.5Y 6/2) fine sand; few medium faint light olive brown (2.5Y 5/6) mottles; very weak coarse prismatic

structure parting to single grain; very friable; few roots; neutral; clear wavy boundary.

B32g-28 to 34 inches, light brownish gray (2.5Y 6/2) fine sand; few medium distinct yellowish brown (10YR 5/6) mottles; single grain; loose; few roots; neutral; abrupt smooth boundary.

B33g-34 to 36 inches, gray (10YR 6/1) sand; few fine faint pale brown (10YR 6/3) mottles; single grain; loose; few roots; neutral; abrupt smooth boundary.

Cg-36 to 63 inches, stratified, light brownish gray (2.5Y 6/2), light olive brown (2.5Y 5/4), and gray (5Y 5/1) fine sand; few medium distinct dark brown (10YR 4/3) mottles in the upper part; single grain; loose; moderately alkaline; calcareous; water table at a depth of 60 inches.

The thickness of the solum, and generally the depth to carbonates, ranges from 22 to 55 inches but most commonly is 24 to 38 inches.

The thickness of the dark colored A horizon is more than 10 inches and generally ranges from 10 to 16 inches. This horizon is very dark gray (10YR 3/1 or N 3/0) or black (10YR 2/1 or N 2/0).

The B horizon is grayish brown (10YR 5/2), gray (10YR 5/1), light brownish gray (10YR 6/2), or dark gray (10YR 4/1). Mottling in this horizon is faint to distinct, light olive brown (2.5Y 5/6), olive brown (2.5Y 4/4), and yellowish brown (10YR 5/6). In some places the B horizon dominantly is gray and the mottling is subdued. This horizon generally is loamy fine sand and fine sand and has some thin layers of medium or coarser sand.

The C horizon is gray (10YR 5/1) to light brownish gray (2.5Y 6/2) in color and fine or medium sand in texture. Fine textured lake deposited clay or glacial till is at a depth ranging from 5 to 12 feet.

Granby soils are the very poorly drained members of a drainage sequence that includes the well drained Oakville soils, moderately well drained Ottokee soils, and somewhat poorly drained Tedrow soils. They commonly are adjacent to those soils, and they are adjacent to very poorly drained Millgrove, Gilford, and Colwood soil in some places.

The Granby soils are coarser textured than the Gilford, Millgrove, Colwood, or Wauseon soils. They lack the fine textured C horizon above a depth of 40 inches that is present in the very poorly drained Wauseon soils.

Haney Series

The Haney series consists of deep, nearly level to sloping, moderately well drained soils that are loamy and have a sandy and loamy substratum. These soils are on beach ridges, outwash plains, and stream terraces.

In a representative profile of a Haney soil that is cultivated, the plow layer is dark grayish brown loam about 9 inches thick. The subsoil, between depths of 9 and 36 inches, is dark brown and, between depths of 36 and 42 inches, is dark reddish brown. The upper part of the subsoil is loam and fine sandy loam, and the lower part is sandy clay loam and clay loam. The underlying material, between depths of 42 and 80 inches, is dark yellowish brown loamy sand and dark-brown sandy clay loam.

Haney soils have moderate permeability in the subsoil and rapid permeability in the underlying material. They have a deep root zone and medium available moisture capacity. Unless these soils have been limed, the upper part of the root zone is medium acid or strongly acid.

Representative profile of Haney loam, 0 to 2 percent slopes, in a cultivated field in Washington Township (SW¼NW¼SW¼NW¼ sec. 7, T. 5 N., R. 8 E.):

Ap-0 to 9 inches, dark grayish brown (10YR 4/2) loam; moderate medium granular structure; friable; medium acid; abrupt smooth boundary.

BI-9 to 12 inches, dark brown (10YR 4/3) loam; weak medium platy structure parting to moderate fine angular blocky structure; friable; thin very patchy dark reddish brown (5YR 3/3) clay films on vertical surfaces of peds; slightly acid; clear wavy boundary.

B21t-12 to 28 inches, dark brown (7.5YR 4/4) fine sandy loam; few fine faint grayish brown (10YR 5/2) mottles below a depth of 16 inches; moderate medium angular blocky structure; friable; slightly hard; thin patchy dark reddish brown (5YR 3/3) clay films around peds; few fine pebbles; medium acid; gradual wavy boundary.

B22t-28 to 36 inches, dark brown (7.5YR 4/4) sandy clay loam; few medium faint brown (7.5YR 5/4) mottles and few fine faint grayish brown (10YR 5/2) mottles; moderate coarse angular blocky structure; friable; thin patchy dark reddish brown (5YR 3/3) clay films on surfaces of peds; about 2 percent fine pebbles; medium acid; gradual wavy boundary.

B23t-36 to 42 inches, dark reddish brown (5YR 3/4) clay loam; common medium faint brown (7.5YR 5/4), strong brown (7.5YR 5/6), and grayish brown (10YR 5/2) mottles; moderate medium angular blocky structure; friable; thin patchy dark reddish brown (5YR 3/3) clay films around peds; about 3 percent fine pebbles ; neutral; abrupt wavy boundary.

IIC1-42 to 46 inches, dark yellowish-brown (10YR 4/4) loamy sand; single grain; loose; mildly alkaline; calcareous; abrupt wavy boundary.

IIIC2--46 to 63 inches, dark-brown (7.5YR 4/4) sandy clay loam; medium distinct yellowish brown (10YR 5/6) mottles and few fine faint grayish brown (10YR 5/2) mottles; massive; friable; mildly alkaline; calcareous; abrupt wavy boundary.

IVC3-63 to 80 inches, dark yellowish brown (10YR 4/4) loamy sand; single grain; loose; moderately alkaline; calcareous.

The thickness of the solum, and generally the depth to carbonates, ranges from about 26 to 42 inches but is 32 to 40 inches in most places. In some places the upper part of the C horizon is neutral and carbonates are 1 foot to 3 feet below the upper boundary of this horizon. The content of gravel in the solum ranges from 2 to 20 percent. Haney soils that contain gravel are mainly on the beach ridges and river terraces. In many places the Haney soils on outwash plains or along tributaries contain almost no gravel.

The Ap horizon commonly is 8 inches thick, but its thickness ranges from 7 to 10 inches. This horizon generally is dark grayish brown (10YR 4/2) or brown (10YR 4/3). The Ap horizon is loam or fine sandy loam. An A2 horizon occurs in uncultivated areas.

The B horizon is dark brown (7.5YR 4/4 or 10YR 4/3), dark yellowish brown (l0YR 4/4), dark reddish brown (5YR 3/4), or brown (7.5YR 5/4). Mottles are faint, brown (7.5YR 5/4), strong brown (7.5YR 5/6), and grayish brown (10YR 5/2). The grayish (2-chroma) mottles occur throughout the Bt horizon. The ped coatings generally are dark reddish brown, dark brown, or dark grayish brown. The B horizon normally is sandy clay loam, light clay loam, or loam.

The C horizon commonly is brown (10YR 4/3), dark brown (7.5YR 4/4), grayish brown (10YR 5/2), or dark yellowish brown (10YR 4/4). It generally is calcareous, though the upper part is neutral in some places. Fine and medium sands are the dominant textures, but gravelly loamy sand and some strata of sandy clay loam commonly occur where these soils are on beach ridges and stream terraces. Finer textured lake clay or till material occurs under the coarse materials. The clayey material is at a depth ranging from 4 to 8 feet.

Haney soils are the moderately well drained members of a drainage sequence that includes the well drained Oshtemo soils, the somewhat poorly drained Digby soils, and the very poorly drained Millgrove soils. They commonly are adjacent to those soils. They are similar to moderately well drained Rawson soils but lack their underlying fine-textured C horizon above a depth of 40 inches. Haney soils typically have a redder hue in the B horizon than Rawson soils. They lack the fine sand and silt that is common in Tuscola soils, and they are not so red throughout as Vaughnsville soils.

Haskins Series

The Haskins series consists of nearly level, somewhat poorly drained soils on beach ridges, outwash plains, and stream terraces. These soils formed partly in loamy soil material and partly in underlying lacustrine clay or glacial till modified by water action. The finer textured substratum is at a depth of 20 to 40 inches.

In a representative profile of a Haskins soil that is cultivated, the plow layer is dark grayish brown loam about 7 inches thick. The subsoil, between depths of 7 and 28 inches, is dark yellowish brown clay loam, dark grayish brown sandy clay loam, and grayish brown silty clay. The underlying material between depths of 28 and 60 inches or more, is grayish brown silty clay.

Haskins soils have moderate permeability in the subsoil and slow permeability in the fine-textured underlying material. They are saturated for significant periods in winter and summer because of the slowly permeable substratum. They have medium available moisture capacity and a moderately deep root zone. Haskins soils are medium acid to strongly acid in the upper 24 inches unless they are limed.

Representative profile of Haskins loam, 0 to 2 percent slopes, in a cultivated field in Marion Township (NW¼NE¼SE¼SW¼ sec. 25, T. 3 N., R. 7 E.):

Ap to 7 inches, dark grayish brown (10YR 4/2) loam; weak fine subangular blocky structure parting to moderate medium granular; friable, slightly hard; slightly acid; abrupt smooth boundary.

B21tg-7 to 15 inches, dark yellowish brown (10YR 4/4) clay loam; many fine faint dark grayish brown (2.5Y 4/2) mottles; moderate fine subangular blocky structure; firm hard; dark gray (10YR 4/1) ped coatings that have thin patchy dark gray (10YR 4/1) clay films; slightly acid; clear smooth boundary.

B22tg-15 to 24 inches, dark grayish brown (10YR 4/2) sandy clay loam; common medium distinct yellowish brown (10YR 5/6) and pale brown (10YR 6/3) mottles; moderate medium subangular blocky structure; firm, hard; dark gray (10YR 4/1) ped coatings that have thin patchy dark gray (10YR 4/1) clay films; common fine pebbles; neutral; abrupt smooth boundary.

IIB3tg-24 to 28 inches, grayish brown (2.5Y 5/2) silty clay; common medium distinct dark yellowish-brown (10YR 4/4) and yellowish brown (10YR 5/6) mottles; moderate medium angular blocky structure; very firm, very hard; dominantly gray (10YR 5/1) coatings on peds; thin patchy gray (10YR 5/1) clay films on vertical ped surfaces, very patchy gray (10YR 5/1) clay films on horizontal ped surfaces; mildly alkaline; few fine pebbles; clear wavy boundary.

IIICg-28 to 60 inches, grayish brown (2.5Y 5/2) silty clay; massive; very firm, very hard; few fine pebbles; moderately alkaline; calcareous.

The thickness of the solum, and commonly the depth to carbonates, ranges from about 24 to 44 inches. In some places the lower few inches of the solum is calcareous. The depth to the fine-textured material of the IIB and IIC horizons ranges from 20 to 40 inches. The gravel content in the solum ranges from 2 percent to about 15 percent.

The Ap horizon commonly is 7 or 8 inches thick and generally is dark grayish brown (10YR 4/2) or dark gray (10YR 4/1). The texture is loam or fine sandy loam. An A2 horizon occurs in uncultivated areas.

In the B horizon, matrix colors are dark yellowish brown (10YR 4/4) and dark grayish brown (10YR 4/2), but colors range to dark brown (10YR 4/3) and brown (10YR 5/3). Mottling is faint to distinct, dark grayish brown (2.5Y 4/2), yellowish brown (10YR 5/6), and dark yellowish brown (10YR 4/4). Colors of ped coatings are dominantly darker and have a chroma of 2 or less. Texture of the B horizons generally are sandy clay loam or light clay loam, but layers of loam commonly occur. In some places a 2- to 8-inch layer of loamy sand or fine sand occurs above the IIB3tg horizon.

This coarse-textured layer is commonly discontinuous. The matrix colors of the IIB horizon are typically grayish brown (2.5Y 5/2), gray (10YR 5/1), or brown (10YR 5/3), and the texture is silty clay, clay, or clay loam.

The IIC horizon commonly is grayish brown (10YR 5/2, 2.5Y 5/2) or brown (10YR 4/3) but ranges to gray (10YR 5/1), and the texture generally is silty clay, clay, or clay loam. This horizon typically is calcareous.

Haskins soils are the somewhat poorly drained members of a drainage sequence that includes the moderately well drained Rawson soils and the very poorly drained Mermill soils. They are adjacent to the Mermill soils in many places. They are less commonly adjacent to the Rawson soils. The Haskins soils are similar to Digby soils in some properties but lack a sandy or loamy C horizon. They have a lower content of fine sand and silt than the somewhat poorly drained Kibbie soils.

Hoytville Series

The Hoytville series consists of nearly level, dark-colored, very poorly drained soils. The soils formed in clayey glacial till beveled and reworked by lake action. They are in broad flats on uplands, chiefly in the southern part of the county and north and west of Napoleon.

In a representative profile of a Hoytville soil that is cultivated, the plow layer is very dark grayish-brown clay about 7 inches thick. The subsoil, between depths of 7 and 37 inches is gray and olive-gray clay that is mottled with yellowish brown or dark yellowish brown, or both. The underlying material, between depths of 37 and 60 inches, is dark yellowish-brown clay glacial till. The upper foot or two of this compact till material is partially weathered. It contains numerous pebbles and fragments of limestone and there are some coarse fragments and pebbles throughout the soil.

Hoytville soils have moderately slow permeability in the subsoil and slow permeability in the till material. They commonly are saturated during winter and spring and dry out slowly in spring unless they have been artificially drained. They have high available moisture capacity and a root zone that is deep where they are adequately drained or when water in the soil is depleted in summer. Hoytville soils are slightly acid to neutral in the upper part of the root zone.

Representative profile of Hoytville clay, in a cultivated field in Pleasant Township (SW¼NW¼SW¼SE¼ sec.27,T.3N.,R.6E.):

Ap-0 to 7 inches, very dark grayish brown (10YR 8/2) clay; moderate medium and coarse angular blocky structure; firm; 2 percent coarse fragments; slightly acid; abrupt smooth boundary.

B21tg-7 to 11 inches, gray (10YR 5/1) clay; many medium distinct yellowish brown (10YR 5/4 or 5/6) mottles; moderate medium angular blocky structure; firm; some black (10YR 2/1) organic staining on peds; thin patchy grayish brown (10YR 5/2) clay films on peds; 2 percent angular coarse fragments; neutral; clear smooth boundary.

B22tg-11 to 16 inches, olive gray (5Y 5/2) clay; common medium prominent yellowish brown (10YR 5/6) and dark yellowish brown (10YR 4/4) mottles; moderate medium and fine angular blocky structure; firm; thin patchy dark grayish brown (10YR 4/2) clay films on peds; 4 percent angular coarse fragments; neutral; clear smooth boundary.

B23tg-16 to 27 inches, olive gray (5Y 5/2) clay; common medium prominent brownish yellow (10YR 6/8) and dark yellowish brown (10YR 4/4) mottles; weak medium and coarse prismatic structure parting to moderate medium and fine angular blocky; very firm; thin patchy dark grayish brown (10YR 4/2) clay films around peds; 4 percent angular coarse fragments; neutral; gradual smooth boundary.

B3tg-27 to 87 inches, olive gray (5Y 5/2) clay; common medium prominent yellowish brown (10YR 5/4 or 5/6) mottles; moderate coarse prismatic structure parting to moderate medium angular blocky; firm; thin continuous dark grayish brown (2.5Y 4/2) clay firms on vertical ped surfaces; 5 percent angular coarse fragments; neutral; clear smooth boundary.

C-87 to 60 inches, dark yellowish brown (10YR 4/4) clay; light gray (10YR 7/2) calcareous areas common on vertical cleavage faces; massive; firm, sticky; thin patchy gray (5Y 5/1) clay films on vertical cleavage faces; 6 percent angular coarse fragments; mildly alkaline.

Figure 10. Profile of Hoytville soil. Organic matter darkens the surface layer and the reduction and oxidation of iron is evident in the lower horizons.

The thickness of the solum, and commonly the depth to carbonates, ranges from 36 to 55 inches but most commonly is 40 to 50 inches. In some places the upper part of the C horizon is calcareous only in patchy areas. Coarse fragments, which are dominantly limestone but include some shale and igneous pebbles, make up about 2 to 8 percent of the soil mass.

The thickness of the dark colored Ap horizon generally is 7 to 8 inches but ranges from 6 to 9 inches. This horizon is very dark grayish brown (10YR 8/2) or very dark gray

(10YR 3/1). The dominant texture is clay, but it is clay loam in some places.

The B horizon generally is gray (10YR 5/1 or 6/1 or 5Y 5/1) or olive gray (5Y 5/2) but ranges to dark gray (10YR 4/1). This horizon has distinct to prominent, yellowish brown (10YR 5/4 and 5/6) and dark yellowish brown (10YR 4/4) mottles. Gray mottles and gray or grayish brown clay films are common on ped surfaces. The B horizon is clay and has a content of clay ranging from 40 to 50 percent.

The C horizon is commonly dark yellowish brown (10YR 4/4) or grayish brown (10YR 5/2), but it is gray (10YR 5/1 or 5Y 5/1) in places. This horizon has few or common mottles of yellowish brown (10YR 5/6 and 5/8), dark yellowish brown (10YR 4/4), dark grayish brown (10YR 4/2), gray (5Y 5/1), olive gray (5Y 5/2), or grayish brown (10YR 5/2). The horizon is clay loam or clay.

Hoytville soils are the very poorly drained members of a drainage sequence that includes the moderately well drained St. Clair soils and the somewhat poorly drained Nappanee soils. They are adjacent to those soils in areas where well developed drainageways occur, but elsewhere they mainly are adjacent to the Nappanee soils. They commonly are adjacent to very poorly drained Lenawee, Latty, and Toledo soils in some places.

The Hoytville soils have about the same content of clay as Toledo and Latty soils, but they formed in glacial till material, whereas the Toledo and Latty soils formed in lacustrine silty clay material. Hoytville soils differ from Lenawee soils in having a higher content of clay and a lower content of sand in the B horizon. In addition, they formed in till, whereas the Lenawee soils formed in stratified lacustrine material.

Hoytville Series, Thin Solum Variant

The Hoytville series, thin solum variant, consists of dark colored, very poorly drained soils. These soils formed in clayey glacial till that was modified or reworked by water. They are in fairly broad areas in a small valley in Ridgeville Township that is 5 to 6 feet lower than the uplands.

In a representative profile of a Hoytville, thin solum variant, soil that is cultivated, the plow layer is black clay about 9 inches thick. Between depths of 9 and 13 inches, there is a subsoil of dark grayish brown clay that has distinct, light olive brown mottles. The underlying material, between depths of 13 and 60 inches or more, is compact clay glacial till. The upper 12 inches of the till shows considerable evidence of having been reworked by lake water.

Hoytville, thin solum variant, soils have slow permeability in the subsoil and in the till material. They are seasonally saturated for a significant period of time, and they dry out very slowly in spring unless they have been adequately drained. They have low available moisture capacity and a root zone that is shallow to moderately deep where it is adequately drained.

Representative profile of Hoytville clay, thin solum variant, in a cultivated field in Ridgeville

Township (NE¼NW¼NE¼ sec. 14, T. 6 N., R. 5 E.):

Ap-0 to 9 inches, black (10YR 2/1) clay; weak medium subangular blocky structure parting to moderate medium granular; firm; neutral; abrupt smooth boundary

Bg-9 to 13 inches, dark grayish brown (2.5Y 4/2) clay; few medium distinct light olive brown (2.5Y 5/4 and 5/6) mottles; moderate medium angular blocky structure; firm; thin very patchy dark gray (10YR 4/1) coatings on vertical ped faces; few fine angular stones and pebbles; mildly alkaline; clear wavy boundary.

C1g-13 to 20 inches, dark grayish brown (2.5Y 4/2) clay; common medium distinct light olive brown (2.5Y 5/4 and 5/6) mottles; weak medium angular blocky structure; firm; some pebbles and coarse fragments; moderately alkaline; calcareous; clear wavy boundary.

C2g-20 to 23 inches, dark grayish brown (2.5Y 4/2) clay; common medium distinct light olive brown (2.5Y 5/4) and olive brown (2.5Y 4/4) mottles; weak thick platy structure; firm; common strong brown (7.5YR 5/6) oxide coatings; some pebbles and angular stones; moderately alkaline; calcareous; abrupt wavy boundary.

C3-23 to 60 inches, brown (10YR 4/3) clay; common medium distinct dark grayish brown (10YR 4/2) and yellowish-brown (10YR 5/6) mottles; massive; firm; numerous pebbles and angular fragments; moderately alkaline; calcareous.

The thickness of the solum, and commonly the depth to carbonates, ranges from 12 to 20 inches. The B horizon generally has lower color values and fewer bright mottles than is typical for the Hoytville series.

These Hoytville soils are adjacent to Mermill soils and to lighter colored Nappanee soils, which occur on the adjacent valley slopes. They have a much thinner Bt horizon than normal Hoytville soils. They are much darker colored than the adjacent, lighter colored Nappanee soils.

Kibbie Series

The Kibbie series consists of deep, nearly level, somewhat poorly drained soils that are mainly in Liberty Township. These soils formed in loamy materials on uplands.

In a representative profile of a Kibbie soil that is cultivated, the plow layer is dark grayish-brown fine sandy loam about 13 inches thick. The subsurface layer is pale brown fine sandy loam about 2 inches thick. The subsoil between depths of 15 and 38 inches, is yellowish brown and pale-brown loam and light yellowish-brown very fine sandy loam. It has yellowish-brown and grayish brown mottles. The subsoil has a slightly higher content of clay than the surface layer. The underlying material, between depths of 38 and 72 inches, is stratified, calcareous silt, fine sand, and silt loam.

Kibbie soils have moderate permeability in the subsoil and in the underlying stratified materials. They are seasonally saturated for long periods and dry out slowly in spring unless they have been adequately drained. They have high available moisture capacity. The root zone is deep if the soils are adequately drained and in summer when the water table is low. The root zone is slightly acid to neutral.

Representative profile of Kibbie fine sandy loam, 0 to 2 percent slopes, in a cultivated field in Liberty Township (SW¼SW¼NW¼NW¼ sec. 33, T. 6 N., R. 7 E.):

Ap1-0 to 9 inches, dark grayish brown (10YR 4/2, 6/2 dry) fine sandy loam; very weak fine subangular blocky structure parting to moderate fine granular; very friable; many roots; slightly acid; abrupt smooth boundary.

Ap2-9 to 13 inches, dark grayish brown (10YR 4/2, 6/2 dry) fine sandy loam; weak medium platy structure parting to moderate fine granular; very friable; many roots; slightly acid; abrupt smooth boundary.

A2-13 to 15 inches, pale brown (10YR 6/3) fine sandy loam; common fine distinct yellowish brown (10YR 5/6) and dark brown (7.5YR 4/4) mottles; weak medium platy structure parting to weak very fine subangular blocky; very friable; common roots; slightly acid; clear smooth boundary.

B21t-15 to 24 inches, yellowish-brown (10YR 5/4) loam; few fine faint light yellowish brown (10YR 6/4) and yellowish brown (10YR 5/6) mottles and many medium grayish brown (2.5Y 5/2) mottles; moderate fine angular blocky structure; friable; common roots; thin patchy grayish brown (10YR 5/2) clay films on peds; many medium grayish brown (2.5Y 5/2) mottles on peds; slightly acid; clear smooth boundary.

B22t-24 to 31 inches, pale brown (10YR 6/3) loam; common fine distinct yellowish brown (10YR 5/6) mottles and many medium faint grayish brown (2.5Y 5/2) mottles; weak fine angular blocky structure; friable; few roots; thin patchy grayish brown (2.5Y 5/2) clay films around peds; many medium faint grayish brown (2.5Y 5/2) mottles on ped faces; neutral; clear wavy boundary.

B3-31 to 38 inches, light yellowish brown (10YR 6/4) very fine sandy loam; common fine distinct yellowish brown (10YR 5/8) mottles; very weak medium subangular blocky structure parting to very weak fine subangular blocky structure; friable; few roots; thin very patchy dark grayish brown (10YR 4/2) clay films on vertical ped surfaces; mildly alkaline; clear wavy boundary.

Cg-38 to 72 inches, grayish brown (2.5YR 5/2), stratified silt, silt loam, and fine sand; many medium distinct gray (10YR 6/1) mottles and few medium distinct strong brown (7.5YR 5/6) mottles; very coarse platy structure; friable; light gray (10YR 7/1) calcium carbonate accumulations; moderately alkaline; calcareous.

The thickness of the solum, and commonly the depth to carbonates, ranges from 24 to 48 inches but in most places is between 26 and 44 inches.

The Ap horizon ranges from 7 to 13 inches in thickness. Its color generally is dark grayish brown (10YR 4/2), though it appears to be very dark grayish brown (10YR 3/2) until crushed. The dominant texture of the Ap horizon is fine sandy loam, but its texture ranges to very fine sandy loam, loam, and silt loam.

The B horizon generally is brown (10YR 5/3), pale brown (10YR 6/3), or yellowish brown (10YR 5/4) but ranges to grayish brown (10YR 5/2) or light yellowish brown (10YR 6/4). Mottling is faint to distinct, light yellowish brown (10YR 6/4). yellowish brown (10YR 5/6), grayish brown (10YR 5/2 or 2.5Y 5/2), gray (10YR 5/1), and brown (10YR 4/3). Ped surfaces in the Bt horizon have a dominant chroma of 2. The B horizon is loam, fine sandy loam, or sandy clay loam; clay loam, and silt loam layers occur in some places.

The C horizon is commonly grayish brown (2.5Y 5/2) but ranges to brown (10YR 5/3), yellowish brown (10YR 5/4), or dark yellowish brown (10YR 4/4). It is typically stratified with layers of fine sand, very fine sand, silt, and silt loam. The layers range from 1/8 inch to about 5 inches in thickness.

Kibbie soils are the somewhat poorly drained members of a drainage sequence that includes the moderately well drained Tuscola soils and the very poorly drained Colwood soils. They are adjacent to those soils in areas where well developed drainageways occur. They commonly are adjacent to somewhat poorly drained Del Rey soils. The Kibbie soils have a lower content of clay in the B horizon than the Del Rey soils, and they have a higher content of fine sand. They have a higher content of silt and fine sand in the B horizon than somewhat poorly drained Digby soils. They differ from Haskins soils in lacking a finer textured C horizon within a depth of 40 inches.

The Kibbie soils in this county have a lighter colored A horizon and grayer ped surfaces in the B horizon than the defined range for the series. These differences do not greatly affect the use or management of these soils.

Latty Series

The Latty series consists of deep, level to nearly level, very poorly drained soils. These soils formed in lacustrine clay that is underlain by Wisconsinan clayey glacial till. They are in broad areas on uplands and are only in Pleasant and Ridgeville Townships.

In a representative profile of a Latty soil that is cultivated, the plow layer is dark gray clay about 8 inches thick. The subsoil, between depths of 8 and 41 inches, is gray clay that contains many, distinct, yellowish brown mottles. The subsoil has about the same content of clay as the surface layer. The underlying material, between depths of 41 to 71 inches, is calcareous clay glacial till. This material is compact and contains numerous pebbles and fragments of limestone.

Latty soils have slow permeability in the subsoil and very slow permeability in the underlying till. They are saturated for long periods in winter and spring, and they are slow to dry out in spring unless they have been adequately drained. They have medium available moisture capacity and a root zone that is mostly moderately deep if the soil is drained. Latty soils are slightly acid to neutral in the upper part of the root zone.

Representative profile of Latty clay, in a cultivated field in Pleasant Township (NE¼NE¼NE¼NW¼ sec. 31,T.3N.,R.6E.):

Ap-0 to 8 inches, dark gray (10YR 4/1) clay; few fine faint dark brown (10YR 4/3) mottles; weak medium granular structure between depths of 0 and 2 inches, weak medium angular blocky structure between depths of 2 and 8 inches; firm; many roots; slightly acid; abrupt smooth boundary.

B21g-8 to 15 inches, gray (N 5/0) clay; many medium distinct yellowish brown (10YR 5/4) mottles; weak medium prismatic structure parting to moderate fine angular blocky; firm; common roots; dark gray (10YR 4/1) ped surfaces that have common fine faint dark yellowish brown (10YR 4/4) mottles; neutral; gradual smooth boundary.

B22g-15 to 28 inches, gray (N 5/0) clay; medium distinct yellowish brown (10YR 5/6) mottles; weak medium prismatic structure parting to moderate medium angular blocky; firm; common roots; dark gray (N 4/0) ped surfaces that have common fine faint dark yellowish brown (10YR 4/4) mottles; neutral; gradual smooth boundary.

B23g-28 to 41 inches, gray (5Y 5/1) clay; many coarse yellowish brown (10YR 5/4 and 5/6) mottles; moderate medium angular blocky structure; firm; few roots; few small pebbles; mildly alkaline; clear smooth boundary.

IIC-41 to 71 inches, yellowish brown (10YR 5/4) clay; many medium distinct grayish brown (10YR 5/2) and greenish gray (5GY 5/1) mottles; massive; firm; few light gray (10YR 7/1) calcium carbonate accumulations; few pebbles and shale fragments; moderately alkaline; calcareous.

The thickness of the solum, and generally the depth to carbonates, ranges from 34 to 60 inches, but more commonly is 36 to 45 inches.

The Ap horizon generally is dark gray (10YR 4/1), but it ranges to dark grayish brown (10YR 4/2).

The B horizon is gray (5Y 5/1; 2.5Y 5/1; N 5/0), but ranges to dark grayish brown (2.5Y 4/2), olive gray (5Y 5/2), and dark gray (10YR 4/1) in some subhorizons. Mottling is mainly distinct, yellowish brown (10YR 5/4), dark yellowish brown (10YR 4/4), or brown (10YR 4/3), but in some places it ranges to light olive (2.5Y 5/4) or 5/6) or strong brown (7.5YR 5/6). The B horizon has a content of clay ranging between 48 and 56 percent.

The C horizon commonly is yellowish brown (10YR 5/4), gray (10YR 5/1; N 5/0; 5Y 5/1), dark grayish brown (10YR 4/2), or dark brown (10YR 4/3) and is mottled with olive gray (5Y 5/2), olive (5Y 5/6), grayish brown (10YR 5/2), brown (7.5YR 5/4), and greenish gray (5GY 6/1). This horizon dominantly is clay but ranges to clay loam.

Latty soils are adjacent to somewhat poorly drained Nappanee soils on slight knolls. They are commonly adjacent to very poorly drained Paulding soils but have less clay in the solum than the Paulding soils; they generally contain 48 to 56 percent clay, whereas the Paulding soils have a clay content of more than 60 percent. Latty soils differ from Toledo soils in lacking a dark-colored surface layer and in having less well developed structure. They differ from very poorly drained Hoytville soils in lacking a dark colored surface layer. Latty soils lack the pebble content in the upper part of the solum that is common in Hoytville soils.

Lenawee Series

The Lenawee series consists of deep, level and nearly level, dark colored soils that are very poorly drained. These soils formed in stratified lacustrine sediment that dominantly is silty clay loam and clay loam in texture. They are in broad areas on uplands on the lake plain, mainly in Napoleon, Liberty, and Flatrock Townships.

In a representative profile of a Lenawee soil that is cultivated, the plow layer is very dark grayish brown silty clay loam about 8 inches thick. The subsoil, between depths of 8 and 43 inches, is grayish brown silty clay loam and clay loam mottled with olive gray, yellowish brown, and light brownish gray. The underlying material, between depths of 43 and 61 inches or more, is stratified, calcareous silty loam, silt, silt loam, and silty clay.

Lenawee soils have moderately slow permeability in both the subsoil and the stratified underlying material. They are saturated for long periods in winter and spring. They have high available moisture capacity and a root zone that is deep if the soil is adequately drained and in summer when the water table is low. The root zone is mostly neutral.

Representative profile of Lenawee silty clay loam, in a cultivated field in Liberty Township (NW¼NE¼NE¼sec. 7, T. 5 N., R. 7 E.):

Ap-0 to 8 inches, very dark grayish brown (10YR 3/2) silty clay loam; moderate medium subangular blocky structure parting to moderate medium granular; firm; neutral; abrupt smooth boundary.

B21g-8 to 16 inches, grayish brown (2.5Y 5/2) silty clay loam; common fine faint olive gray (5Y 5/2) mottles and common distinct yellowish brown (10YR 5/6) mottles; moderate fine angular blocky structure; firm; few yellowish red (5YR 4/6) iron stains; ped faces are gray (10YR 5/1); thin very patchy gray (10YR 5/1) clay films; neutral; clear smooth boundary.

B22tg-16 to 34 inches, grayish brown (2.5Y 5/2) clay loam; common fine distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to strong medium angular blocky structure; firm; thin patchy gray (10YR 5/1) clay films on peds; neutral; gradual smooth boundary

B23tg-34 to 37 inches, grayish brown (2.5Y 5/2) silty clay loam; common fine distinct yellowish brown (10YR 5/6), light brownish gray (2.5Y 6/2), and gray (5Y 5/1) mottles; weak medium subangular blocky structure; firm; ped surfaces are gray (10YR 5/1); thin patchy gray (10YR 5/1) clay films on peds; neutral; gradual smooth boundary.

B3g-37 to 43 inches, grayish brown (2.5Y 5/2) silty clay loam; common fine and medium distinct yellowish brown (10YR 5/6 and 5/8) mottles; weak medium subangular blocky structure; firm; thin very patchy gray (10YR 5/1) clay films on vertical ped faces; mildly alkaline; clear wavy boundary.

C1g-43 to 54 inches, grayish brown (2.5Y 5/2) silty clay loam; many fine and medium distinct yellowish-brown (10YR 5/6) mottles; massive; firm; mildly alkaline; slightly calcareous; diffuse smooth boundary.

C2g-54 to 61 inches, grayish brown (2.5Y 5/2) stratified silt, silt loam, and silty clay; many fine and medium distinct yellowish brown (10YR 5/6) mottles; massive; firm; moderately alkaline; calcareous.

The thickness of the solum, and generally the depth to carbonates, ranges from 36 to 56 inches, but it commonly is 40 to 50 inches.

The Ap horizon generally is very dark grayish brown (10YR 3/2) but ranges to very dark gray (10YR 3/1). Its texture is silty clay loam or loam.

The B horizon generally is grayish brown (2.5Y 5/2) or gray (5Y 5/1) but ranges to dark grayish brown (2.5Y 4/2). The mottling is of both high and low chroma. The texture of the B horizon dominantly is silty clay loam or clay loam; however, layers of silt loam and light silty clay occur in some places.

The C horizon commonly is grayish brown (2.5Y 5/2) or gray (5YR 5/1). Mottling is of high chroma. The C horizon is stratified with layers that dominantly are silty clay loam and clay loam, but there are layers of silt, silt loam, and silty clay in some places.

Lenawee soils are the very poorly drained members of a drainage sequence that includes the moderately well drained Shinrock soils and the somewhat poorly drained Del Rey soils. They are adjacent to those soils in areas where well-developed drainageways occur. They are commonly adjacent to very poorly drained Toledo soils, but they are less clayey than the Toledo soils. Lenawee soils have a higher content of clay and a lower content of silt and fine sand in the B horizons than the very poorly drained Colwood soils. Lenawee soils formed in stratified sediment, in contrast to the very poorly drained Hoytville soils, and they have less clay in the B horizon than Hoytville soils.

The Lenawee soils in this county have a Bt horizon and generally a thicker solum than the defined range for the series. These differences, however, are not such that they greatly change the use or management of the soils.

Lucas Series

The Lucas series consists of gently sloping to very steep, moderately well drained soils. These soils formed in clayey lacustrine sediment. They are on slope breaks along streams that dissect the lake plain.

In a representative profile of a Lucas soil that is severely eroded, the surface layer is dark yellowish-brown silty clay about 5 inches thick. From 7 to 10 inches of the original soil has been eroded away, and the present surface layer is subsoil material. The subsoil, between depths of 5 and 25 inches, is dark yellowish-brown silty clay. Some faint yellowish-brown and grayish-brown mottling occurs in the lower part of the subsoil. The underlying material, between depths of 25 to 60 inches, is stratified, calcareous silty clay that has thin lenses of silt, silt loam, or very fine sand.

Lucas soils have slow permeability in the subsoil and very slow permeability in the stratified underlying material. They have medium available moisture capacity and a root zone that is moderately deep. They are saturated for short periods in winter and spring. Lucas soils are strongly acid or medium acid in the upper 24 inches.

Representative profile of Lucas silty clay, 12 to 45 percent slopes, severely eroded, in a permanent pasture in Washington Township (SW¼SE¼SW¼NE¼ sec. 6, T.5 N., R. 8 E.):

Ap-0 to 5 inches, dark yellowish-brown (10YR 4/4) silty clay; moderate medium angular blocky structure; firm; thin patchy dark-brown (10YR 4/3) clay films on vertical faces; brown (10YR 5/3) silty coatings on ped faces in upper part of horizon; strongly acid; clear wavy boundary.

B22t-5 to 9 inches, dark yellowish brown (10YR 4/4) silty clay; strong medium angular blocky structure; very firm; thin continuous dark yellowish brown (10YR 3/4) clay films; strongly acid; clear wavy boundary.

B23t-9 to 20 inches, dark yellowish brown (10YR 4/4) silty clay; moderate coarse prismatic structure parting to moderate medium angular blocky; very firm; thin continuous dark yellowish brown (10YR 3/4) clay films; medium acid; clear wavy boundary.

B3-20 to 25 inches, dark yellowish brown (10YR 4/4) silty clay; many medium faint yellowish brown (10YR 5/6) mottles and few fine faint grayish brown (10YR 5/2) mottles; moderate medium angular blocky structure; very firm; thin patchy dark yellowish brown (10YR 3/4) clay films on vertical faces; slightly acid; gradual wavy boundary.

C1-25 to 28 inches, dark grayish brown (10YR 4/2) silty clay; common medium faint yellowish brown (10YR 5/6) and grayish brown (10YR 5/2) mottles; massive, but there is a tendency towards weak thick platy structure; very firm; gray (10YR 6/1) lime accumulations on vertical cleavages; moderately alkaline; calcareous; clear smooth boundary.

C2-28 to 60 inches, dark grayish brown (10YR 4/2) silty clay; few fine faint yellowish brown (10YR 5/6) mottles; laminated fine-textured lacustrine material and a few thin lenses of silt and very fine sand; very firm; moderately alkaline; calcareous.

The thickness of the solum, and generally the depth to carbonates, ranges from 20 to 36 inches, but in places the depth to carbonates ranges from 18 to 40 inches.

The light-colored Ap horizon, where present, generally is 4 to 8 inches thick, but in most places it has been all or nearly all removed by erosion. This horizon commonly is dark yellowish brown (10YR 4/4), dark grayish brown (10YR 4/2), dark brown (10YR 4/3), or brown (10YR 5/3), but it ranges to grayish brown (10YR 5/2). The A horizon is silty clay loam or silty clay.

The Bt horizon generally is dark yellowish brown (10YR 4/4) or dark brown (10YR 4/3), but it ranges to brown (10YR 5/3) or yellowish brown (10YR 5/4). The faint mottling is yellowish brown (10YR 4/4) or dark grayish brown (10YR 4/2). The Bt horizon dominantly is silty clay or clay and has a content of clay ranging from 45 to 60 percent. Thin horizons of silty clay loam occur in some places.

The C horizon is dark grayish brown (l0YR 4/2), brown (10YR 4/3), or dark yellowish brown (l0YR 4/4). It dominantly is silty clay, but in some places it is clay. Thin strata or layers of silty clay loam, silt loam, silt, or very fine sand occur in many places.

Lucas soils are the moderately well drained members of a drainage sequence that includes the somewhat poorly drained Fulton soils and the very poorly drained Toledo soils. They are adjacent to those soils in areas where well-developed drainageways occur. They are adjacent to moderately well drained St. Clair soils in some places. Lucas soils have fewer pebbles and less sand throughout than St. Clair soils. They have a much higher content of clay throughout than moderately well drained Shinrock or Tuscola soils.

Medway Series

The Medway series consists of deep, nearly level, dark colored soils that are moderately well drained. These soils formed in alluvial deposits on flood plains along the Maumee River. They are flooded during periods of high water. Flooding occurs mainly during winter months, but it can occur any time of the year.

In a representative profile of a Medway soil that is cultivated, the plow layer is very dark gray silt loam about 9 inches thick. The next layer is very dark gray silt loam to a depth of 18 inches and dark-brown silty clay loam to a depth of 29 inches. The subsoil, between depths of 29 and 34 inches, is dark-brown clay loam. The underlying material, between depths of 34 inches and more than 60 inches, is dark-brown clay loam that is mottled with brown and grayish brown.

Medway soils are moderately permeable throughout the solum and underlying material. They have a deep root zone that is neutral, and they are high in available moisture capacity. They have a seasonally high water table for short periods.

Representative profile of Medway silt loam, in a cultivated field in Washington Township (SW¼SW¼SW¼NW¼ sec. 7, T. 5 N., R. 8 E.) :

Ap-0 to 9 inches, very dark gray (10YR 3/1) silt loam; moderate medium granular structure; friable; many roots; neutral; abrupt smooth boundary.

A11-9 to 18 inches, very dark gray (10YR 3/1) silt loam; very dark grayish brown (10YR 3/2) crushed; weak fine angular blocky structure; friable; few roots; neutral; gradual wavy boundary.

A12-18 to 29 inches, dark-brown (10YR 3/3) light silty clay loam, very dark grayish brown (10YR 3/2) crushed; weak medium angular blocky structure; friable; few dark gray (10YR 4/1) organic coatings on peds and in root channels; neutral; gradual wavy boundary.

B-29 to 34 inches, dark brown (7.5YR 4/2) light clay loam; few fine and medium faint brown (10YR 5/3) and grayish brown (10YR 5/2) mottles; moderate medium angular blocky structure; friable; neutral; clear wavy boundary.

C-34 to 60 inches, dark brown (7.5YR 4/4) light clay loam; few fine faint brown (10YR 5/3) and grayish brown (10YR 5/2) mottles: very weak medium subangular blocky structure to massive; friable; mildly alkaline; weakly calcareous.

The thickness of the solum, and generally the depth to carbonates, ranges from about 30 to 50 inches. In some places the lower part of the solum is weakly calcareous.

The dark-colored A horizon generally is 24 to 34 inches thick. It commonly is very dark grayish brown (10YR 3/2) or very dark gray (10YR 3/1) but ranges to very dark brown (10YR 2/2) in some places. Rubbed colors are slightly lighter. The A12 horizon is silt loam or light silty clay loam. The A horizon commonly is neutral to mildly alkaline. In places the A12 horizon is weakly calcareous.

The B horizon generally is dark brown (10YR 4/3 or 7.5YR 4/2) to brown (10YR 5/3). Mottling is faint, brown (10YR 5/3), yellowish brown (10YR 5/4), and grayish brown (10YR 5/2). The texture of the B horizon generally is silt loam or loam but ranges to light clay loam or light silty clay loam. The content of sand in the silt loam and light silty clay loam is more than 15 percent.

The C horizon generally is brown (10YR 4/3) or dark brown (7.5YR 4/4), but it ranges to yellowish brown (10YR 5/4 or 5/6) in some places. This horizon has few to common, faint, grayish brown (10YR 5/2) and yellowish brown (10YR 5/4), brown (10YR 5/3), or dark brown (10YR 4/3) mottles. The C horizon generally is calcareous loam, silt loam or clay loam. In many places it is stratified and commonly there are coarser layers of sandy loam, loamy sand, and sand and gravel. Many of these layers are thin.

Medway soils are the moderately well drained members of a drainage sequence that includes well drained Ross soils. They are commonly adjacent to the Ross soils and differ from them in having low chroma mottles in the B horizon. They also are adjacent to the lighter colored, well drained Genesee soils, the somewhat poorly drained Shoals soils, and the dark colored, very poorly drained Sloan soils. Medway soils are less gray and have fewer mottles in the B horizon than do Sloan soils. They have a darker A horizon and less grayness and mottling in the solum than Shoals soils.

In this county the dark colored A horizon of Medway soils, and commonly their solum, are thicker than typical for the series. These differences do not greatly affect the use and management of the soils.

Mermill Series

The Mermill series consists of nearly level, dark colored, very poorly drained soils. These soils formed in loamy material and underlying finer textured material. They are in broad areas on uplands and in scattered smaller areas in other parts of the county.

In a representative profile of a Mermill soil that is cultivated, the plow layer is very dark brown loam about 9 inches thick. The subsoil, between depths of 9 and 40 inches, is dark gray or light brownish gray sandy clay loam and clay loam that contain distinct, yellowish brown, brownish yellow, and grayish brown mottles. The underlying material, between depths of 40 and 60 inches or more, is calcareous lacustrine clay or clayey glacial till.

Mermill soils have moderate permeability in the subsoil and very slow permeability in the fine-textured underlying material. They are saturated for significant periods during winter and spring. They have medium available moisture capacity, and the root zone is moderately deep when the water table is lowered by artificial drainage or in summer when the water table is low.

Representative profile of Mermill loam, in a cultivated field In Harrison Township (NW¼SW¼ sec. 36, T. 5 N., R. 7 E.):

Ap-0 to 9 inches, very dark brown (10YR 2/2) loam; weak medium subangular blocky structure; friable; many roots; slightly acid; abrupt smooth boundary.

B21tg-9 to 17 inches, dark gray (10YR 4/1) sandy clay loam; common fine distinct yellowish brown (10YR 5/4 and 5/8) mottles; moderate medium angular blocky structure; firm; many roots; thin patchy films on peds; slightly acid; gradual wavy boundary.

B22tg-17 to 34 inches, light brownish gray (10YR 6/2) sandy clay loam; many medium distinct yellowish brown (10YR 5/4 and 5/8) and grayish brown (10YR 5/2) mottles; weak medium prismatic structure parting to moderate medium subangular blocky structure; firm; common roots; thin patchy clay films on peds; neutral; clear wavy boundary.

IIB3g-34 to 40 inches, dark gray (5Y 4/1) clay loam; many coarse distinct brownish yellow (10YR 6/8) and yellowish brown (10YR 5/4) mottles; moderate coarse prismatic structure in upper part of the horizon, massive in the lower part; very firm; few roots; mildly alkaline; clear smooth boundary.

IIC1g-40 to 52 inches, olive gray (5Y 5/2) clay; common coarse distinct yellowish brown (10YR 5/8) and brownish yellow (10YR 6/8) mottles; massive; very firm; some vertical cracks extend into the horizon, and the vertical faces have thick coatings; moderately alkaline; calcareous; gradual smooth boundary.

IIC2g-52 to 60 inches, dark-gray (10YR 4/1) clay; massive; very firm; common black shale and limestone fragments; moderately alkaline; calcareous.

The thickness of the solum ranges from 24 to 40 inches. and the depth to the fine-textured C horizon ranges from 20 to 40 inches. The solum commonly extends several inches into the finer textured material. The content of gravel in the solum ranges from none to about 15 percent. Mermill soils that contain gravel mainly are on the beach ridges and stream terraces.

The Ap horizon commonly is about 7 to 9 inches thick and generally is very dark brown (10YR 2/2), very dark gray (10YR 3/1), or very dark grayish brown (10YR 3/2). It dominantly is loam, but it is clay loam or fine sandy loam in places.

The B horizon is dark gray (10YR 4/1), olive gray (5Y 5/2), light brownish gray (10YR 6/2), or grayish brown (10YR 52) and is mottled with distinct, yellowish brown (10YR 5/4 and 5/6), dark yellowish brown (10YR 4/4) and grayish brown (10YR 5/2) mottles. The B horizon generally is sandy clay loam or clay loam, but it ranges to loam. In some places a 2- to 8-inch layer of loamy sand or fine sand occurs above the IIB3g horizon. The IIB horizon is typically dark gray (5Y 4/1), grayish brown (10YR 5/2), or dark brown (10YR 4/3), but in some places it is dark yellowish brown (10YR 4/4). The IIB horizon is silty clay, clay, or clay loam.

The C horizon commonly is olive gray (5Y 5/2), dark gray (10YR 4/1), dark grayish brown (10YR 4/2), or dark brown (10YR 4/3). It is calcareous clay, silty clay, or clay loam. The C horizon materials are either lacustrine or glacial till deposits. The lacustrine C horizon is commonly 1 to 4 feet thick over glacial till.

Mermill soils are the very poorly drained members of a drainage sequence that includes the moderately well drained Rawson soils and the somewhat poorly drained Haskins soils. They are adjacent to both of those soils in many places. They are similar to Millgrove soils in some properties, but lack the underlying sandy or gravelly loamy sand C horizon. Mermill soils lack the fine sand and silt that are common in very poorly drained Colwood soils. They are finer textured in the upper 20 to 40 inches than the very poorly drained Wauseon soils.

Millgrove Series

The Millgrove series consists of nearly level, dark colored, very poorly drained soils. These soils formed in loamy material underlain by stratified sandy and gravelly material. They are in broad areas on uplands in the central part of the county, and they are also in scattered smaller tracts on or near beach ridges and along drainage ways elsewhere in the county.

In a representative profile of a Millgrove soil that is cultivated, the plow layer is very dark brown loam about 9 inches thick. The lower part of the surface layer is very dark grayish brown loam about 3 inches thick.

The subsoil, between depths of 12 and 42 inches, is gray sandy clay loam and clay loam that is mottled with distinct yellowish brown, light olive brown, and gray. The underlying material, between depths of 42 and 72 inches, is calcareous sand.

Millgrove soils have moderate permeability in the subsoil and rapid permeability in the sandy or gravelly underlying material. They are saturated for a significant period during winter and spring. They have high available moisture capacity and a root zone that is deep if excess water is removed by artificial drainage or when the seasonal water table is low. They are mostly slightly acid to neutral but, in some places, are medium acid in the upper 18 inches.

Representative profile of Millgrove loam, in a cultivated field in Napoleon Township (SW¼SE¼SE¼SE¼ sec. 24, T. 5 N., R. 6 E.) :

Ap-0 to 9 inches, very dark brown (10YR 2/2) loam; moderate medium granular structure; very friable; many roots; slightly acid; clear smooth boundary.

A1-9 to 12 inches, very dark grayish brown (10YR 3/2) loam; weak medium subangular blocky structure parting to moderate medium granular; very friable; many roots; slightly acid; gradual smooth boundary.

B1g-12 to 17 inches, gray (5Y 5/1) sandy clay loam; many fine distinct yellowish brown (10YR 5/6) light olive brown (2.5Y 5/4), and gray (10YR 6/1) mottles; weak medium subangular blocky structure; friable; common roots; thin very patchy very dark brown (10YR 2/2) clay films on peds; slightly acid; clear smooth boundary.

B21tg-17 to 27 inches, gray (5Y 5/1) clay loam; many medium distinct yellowish brown (10YR 5/6), light olive brown (2.5Y 5/4), and very dark gray (10YR 3/1) mottles; moderate medium angular blocky structure; firm; common roots; medium patchy very dark gray (10YR 3/1) and black (10YR 2/1) clay films on peds; neutral; gradual wavy boundary.

B22tg-27 to 38 inches, gray (5Y 5/1) clay loam; many medium distinct yellowish brown (10YR 5/6 and 5/8) and strong brown (7.5YR 5/6) mottles; moderate medium prismatic structure parting to moderate coarse subangular blocky; very firm; few roots; medium continuous dark gray (10YR 4/1) clay films on peds; neutral; clear wavy boundary.

B23tg-38 to 42 inches, gray (5Y 6/1) sandy clay loam; many medium distinct yellowish brown (10YR 5/6 and 5/8) and strong brown (7.5YR 5/6) mottles; weak coarse subangular blocky structure; firm; few roots; thin patchy light olive brown (2.5Y 5/4) clay films on vertical ped faces; mildly alkaline; clear wavy boundary.

IIC1-42 to 48 inches, light brownish gray (2.5Y 6/2) sand; few coarse distinct brownish yellow (10YR 6/6 and 6/8) mottles; single grain; loose; moderately alkaline; calcareous; gradual smooth boundary.

IIC2-48 to 72 inches, gray (10YR 6/1) sand; single grain; loose; ¼ to ½-inch clay bands at depths of 55, 58, and 72 inches; moderately alkaline; calcareous; clear wavy boundary.

Thickness of the solum, and commonly the depth to carbonates, ranges from 28 to 42 inches, but it typically is 32 to 40 inches. In some places several inches of the upper part of the substratum is only mildly alkaline. The content of gravel in the solum ranges from 2 to about 20 percent. Millgrove soils that contain gravel are mainly on the beach ridges and stream terraces.

The thickness of the A horizon commonly is about 11 inches but ranges from 10 to 13 inches. The colors are chiefly very dark brown (10YR 2/2), very dark grayish brown (10YR 3/2), and very dark gray (10YR 3/1). The A horizon dominantly is loam or clay loam.

The B horizon generally is gray (10YR 5/1, 5Y 5/1, or 5Y 6/1) or dark gray (10YR 4/1) and it is mottled. The B horizon generally is sandy clay loam or fine loam, but it ranges to light clay loam.

The C horizon commonly is light brownish-gray (2.5Y 6/2), pale brown (10YR 6/3), or gray (10YR 5/1 or 6/1). It is calcareous, and the texture is loamy fine sand or gravelly loamy sand. In some places there are thin lenses or layers of silty clay in bands that range from ¼ to 1 inch in thickness.

Millgrove soils are the very poorly drained members of a drainage sequence that includes the moderately well drained Haney soils and the somewhat poorly drained Digby soils. They commonly are adjacent to those soils and to the very poorly drained Mermill, Colwood, and Gilford soils. Millgrove soils are similar to Mermill soils, except that their substratum is sandy or gravelly material rather than fine-textured material. They have a Bt horizon but the Gilford and Colwood soils do not.

Nappanee Series

The Nappanee series consists of nearly level to gently sloping, somewhat poorly drained soils on uplands. These soils formed in Wisconsinan clay loam or clayey glacial till.

In a representative profile of a Nappanee soil that is cultivated, the plow layer is dark grayish brown silty clay loam about 9 inches thick. The subsoil, between depths of 9 and 24 inches, is grayish-brown silty clay loam and clay mottled with many, faint, yellowish-brown and dark yellowish brown mottles. The underlying material, between depths of 24 and 60 inches, is brown clay loam glacial till. The upper 12 to 24 inches of this material is partially weathered, and it is compact and limy. It contains many pebbles and fragments of limestone and shale.

Nappanee soils have slow permeability in the subsoil and very slow permeability in the underlying glacial till material. They are saturated for significant periods during winter and spring and are slow to dry out in spring unless they have been adequately drained. Nappanee soils have a moderately deep root zone and medium to low available moisture capacity. The upper 18 inches commonly is strongly acid or medium acid.

Representative profile of Nappanee silty clay loam, 0 to 2 percent slopes, in a cultivated field in Richfield Township (NE4SE¼SW¼ sec. 30, T. 4 N., R. 8 E.):

Ap-0 to 9 inches, dark grayish brown (10YR 4/2) silty clay loam; weak medium angular blocky structure, except that structure in the upper 2 inches is moderate medium granular; friable; many roots; 2 percent coarse fragments of shale and limestone; slightly acid; clear smooth boundary.

B21tg-9 to 12 inches, grayish brown (10YR 5/2) silty clay loam; many medium faint dark yellowish brown (10YR 4/4) mottles and common fine faint yellowish brown (10YR 5/4) mottles; weak medium prismatic structure parting to moderate medium angular blocky; firm; common roots; thin patchy very dark grayish brown (10YR 3/2) clay films on peds; common fine black (N 2/0) oxide concretions and very dark gray (N 3/0) stains; 2 percent coarse fragments; medium acid; clear smooth boundary.

B22tg-12 to 20 inches, grayish-brown (10YR 5/2) clay; many fine faint dark yellowish brown (10YR 4/4) mottles and few fine faint yellowish brown (10YR 5/4) mottles; weak medium prismatic to moderate medium prismatic structure in lower part parting to moderate medium angular blocky structure; firm; few roots; thin patchy dark grayish brown (2.5Y 4/2) clay films on peds (ped coatings have a chroma dominantly of 2); many medium faint dark grayish brown (10YR 4/2) surface mottles; very dark gray (N 3/0) oxide stains; 5 percent coarse fragments; neutral; gradual wavy boundary.

B3tg-20 to 24 inches, grayish brown (10YR 5/2) clay; many fine faint dark yellowish brown (10YR 4/4) mottles and few fine faint yellowish brown (10YR 5/4) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; very firm; few roots; thin patchy dark grayish brown (10YR 4/2) clay films on vertical ped surfaces, very patchy on horizontal ped surfaces; few fine distinct greenish gray (5GY 6/1) mottles on ped surfaces; 10 percent coarse fragments; moderately alkaline; spotty calcareous zones; clear wavy boundary.

C-24 to 60 inches, brown (10YR 4/3) clay loam; common fine faint yellowish brown (10YR 5/4) mottles; weak medium angular blocky structure in upper 3 inches, massive below; firm; few roots; thin very patchy grayish brown (2.5Y 5/2) clay films on vertical ped surfaces and in vertical cleavages; moderately alkaline; calcareous.

The thickness of the solum, and generally the depth to carbonates ranges from 18 to 33 inches, but it is commonly 22 to 33 inches. In some places the solum extends several inches into the calcareous material.

The thickness of the Ap horizon commonly is 8 inches but ranges from 6 to 10 inches. The color of this horizon generally is dark grayish brown (10YR 4/2) but ranges to grayish brown (10YR 5/2), and the dominant textures are silty clay loam and loam. An A2 horizon occurs in undisturbed soils.

The B horizon generally is grayish brown (10YR 5/2) or dark grayish brown (10YR 4/2), but in some places it is brown (10YR 4/3 or 5/3). This horizon is mottled with faint to distinct, dark yellowish brown (10YR 4/4), yellowish brown (10YR 5/4 or 5/6), and dark grayish brown (10YR 4/2), or dark gray (10YR 4/1) mottles. The B horizon is clay, silty clay, or clay loam, and its content of clay ranges between 38 and 46 percent. Ped surfaces have a chroma dominantly of 2.

The C horizon commonly is brown (10YR 4/8) or dark grayish brown (10YR 4/2), but in some places it is dark yellowish brown (10YR 4/4). It is mottled with grayish brown (10YR 5/2), gray (10YR 5/1), dark grayish brown (10YR 4/2), and yellowish brown (10YR 5/4 or 5/6) mottles. The C horizon is clay or clay loam, and its content of clay ranges from about 38 to 44 percent.

Nappanee soils are the somewhat poorly drained members of a drainage sequence that includes the very poorly drained Hoytville soils and the moderately well drained St. Clair soils. They are adjacent to the Hoytville soils in many places, and to the St. Clair soils mainly along the larger drainageways. They are adjacent to Fulton soils in some areas. Nappanee soils differ from

Fulton soils by having formed in glacial till in contrast to lacustrine material. They also differ from Fulton soils in having many pebbles and limestone fragments throughout the profile and in having a higher content of sand in the B horizon. Nappanee soils are similar to Del Rey soils, but they have a higher content of clay in the B horizon than those soils and formed in glacial till instead of lacustrine material.

Oakville Series

The Oakville series consists of deep, gently sloping to sloping, well drained, sandy soils. These soils formed on sandy postglacial beach ridges and dunes. They occupy knolls and long ridges on the lake plain, mainly in Washington, Liberty, and Harrison Townships.

In a representative profile of an Oakville soil that is wooded, the upper 3 inches of the surface layer is dark grayish brown fine sand. The lower 6 inches is dark yellowish brown fine sand. The subsoil, between depths of 9 inches and 81 inches, is strong brown fine sand, yellowish brown fine sand, and brownish yellow fine sand. In the lower layers of the subsoil, there are few, faint, light yellowish brown, yellowish brown, and light gray mottles. The underlying material, between depths of 81 and 100 inches or more, is made up of strata of pale brown and yellowish brown fine sand.

Oakville soils have rapid permeability in both the subsoil and the underlying limy sand. They have very low available moisture capacity and a root zone that is deep but droughty. They have a very low capacity for the storage and release of plant nutrients, and they are subject to soil blowing if they are bare of vegetation. Oakville soils are medium acid to strongly acid in the upper 24 inches.

Representative profile of Oakville fine sand, 2 to 12 percent slopes, in a wooded area in Washington, Township (SW¼SE¼NW¼SE¼ sec. 23, T. 6 N., R. 8 E.; laboratory No. HN-76):

A11-0 to 3 inches, dark grayish brown (10YR 4/2) fine sand; very weak fine granular structure; loose; common roots; strongly acid; clear wavy boundary.

A12-8 to 9 inches, dark yellowish-brown (10YR 4/4) fine sand; very weak very fine granular structure; loose; few roots; discontinuous very dark grayish brown (10YR 3/2) fine sand at depths of 8 to 9 inches; medium acid; clear wavy boundary.

B21-9 to 12 inches, strong brown (7.5YR 5/6) fine sand; very weak single grain; loose; few roots; medium acid; clear wavy boundary.

B22-12 to 41 inches, yellowish brown (10YR 5/4) fine sand.; single grain; loose; few roots; few strong brown (7.5YR 5/8) iron nodules; slightly acid; diffuse wavy boundary.

B28-41 to 57 inches, brownish yellow (10YR 6/6) fine sand; few fine faint yellowish brown (10YR 5/8) mottles; single grain; loose; few roots; neutral; diffuse wavy boundary.

B24-57 to 81 inches, brownish yellow (10YR 6/6) fine sand; few fine faint yellowish brown (10YR 5/8) and light yellowish brown (10YR 6/4) mottles; single grain; loose; neutral; clear wavy boundary.

C-81 to 100 inches, pale brown (10YR 6/3) fine sand; few fine distinct strong brown (7.5YR 5/8) and brownish yellow (10YR 6/6) mottles; single grain; very friable; medium acid; clear wavy boundary.

Depth to carbonates ranges from 60 to 130 inches but most commonly is 80 to 100 inches. The upper part of the solum is strongly acid to medium acid, and the lower part is mostly neutral.

The A horizon ordinarily is dark grayish brown (10YR 4/2) or grayish brown (10YR 5/2) but ranges to brown (10YR 4/3) or dark yellowish brown (10YR 4/4) in places.

The B horizon commonly is strong brown (7.5YR 5/6) or yellowish brown (10YR 5/4 or 5/6) but ranges to brownish yellow (10YR 6/6) or light yellowish brown (10YR 6/4). The brighter values and chromas generally are in the upper layer. Some low-chroma mottling occurs in the lower part of the solum in some places. The B horizon commonly is fine sand, but in some places south of the Maumee River, medium sand is dominant in some layers.

The C horizon commonly is light brownish gray (2.5Y 6/2), pale brown (10YR 6/3), or grayish brown (2.5Y 5/2) mottled with dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/6). The texture is fine sand. Thin, dark brown (7.5YR 4/4) lamellae occur in some places. These lamellae are commonly about 1/8 inch thick and at a depth below about 80 inches. They vary in number, contain 5 to 8 percent more clay and slightly more silt than the surrounding fine sand, and are loamy sand in texture. Silty clay or clay underlies these soils at a depth ranging from about 10 to 30 feet.

Oakville soils are the well drained members of a drainage sequence that includes the moderately well drained Ottokee soils, the somewhat poorly drained Tedrow soils, and the very poorly drained Granby soils. They are adjacent to those soils in many places. They are adjacent to well drained Spinks soils in some places but lack the thin, dark brown lamella or bands in the B horizon that are common in Spinks soils. Oakville soils are similar to moderately well drained Seward soils in the upper part, but they lack the finer textured lower part of the B horizon and C horizon that are present within a depth of 40 inches in Seward soils.

The Oakville soils in this county have a thicker B horizon than Oakville soils in other survey areas. This difference does not significantly affect the use and management of the soils.

Oshtemo Series

The Oshtemo series consists of deep, gently sloping, well drained soils. These soils formed in thick loamy material underlain by calcareous gravelly loam or gravel and sand. they are on the crests and upper slopes on the beach ridge in Ridgeville Township.

In a representative profile of an Oshtemo soil that is cultivated, the plow layer is dark brown sandy loam about 7 inches thick. The subsoil, between depths of 7 and 44 inches, is dark brown sandy loam and gravelly sandy loam that has a higher content of clay than the surface layer. The underlying material, between depths of 44 and 70 inches, is calcareous gravelly loam.

Oshtemo soils have moderately rapid permeability. They have low available moisture capacity. and a deep root zone. Unless these soils have been limed, the root zone is medium acid to strongly acid .in the upper part.

Representative profile of Oshtemo sandy loam, 2 to 6 percent slopes, in a cultivated field that had been limed in Pleasant Township (NE¼SE¼ sec. 25, T. 3 N., R. 6 E.):

Ap-0 to 7 inches, dark brown (10YR 4/3) sandy loam; weak fine granular structure; very friable; common roots; few small pebbles; neutral; abrupt smooth boundary.

B1-7 to 17 inches, dark brown (7.5YR 4/4) sandy loam; very weak fine subangular blocky structure; very friable; few roots; few to common pebbles; neutral; clear smooth boundary.

B21t-17 to 29 inches, dark brown (7.5YR 4/4) sandy loam; weak fine to medium subangular blocky structure; very friable; common small pebbles; thin patchy clay films on ped surfaces and clay bridging on sand grains; discontinuous thin layer of calcareous sand; neutral; gradual smooth boundary.

B22t-29 to 44 inches, dark-brown (7.5YR 4/4) gravelly sandy loam; weak fine subangular blocky structure in upper part, massive in the lower part; very friable; thin patchy clay films on ped surfaces and bridging sand grains; few pockets of gravelly sandy clay loam; neutral; clear smooth boundary.

C-44 to 70 inches, gray (N 5/0) gravelly loam; olive yellow (2.5Y 6/8), olive gray (5Y 5/2), and gray (5Y 5/1 or 10YR 6/1) mottles; massive; very friable; 4 inches of gray (10YR 6/1) sand at a depth of 62 inches; moderately alkaline; calcareous; abrupt smooth boundary.

The thickness of the solum, and commonly the depth to carbonates, ranges from 40 to 60 inches, but typically is 40 to 50 inches. Gravel content of the solum ranges from about 2 to 18 percent.

The Ap horizon generally is 6 to 10 inches thick and is dark brown (10YR 4/3) or dark grayish brown (10YR 4/2). The dominant texture of the horizon is sandy loam.

The B horizon commonly is dark brown (7.5YR 4/4) but ranges to dark yellowish brown (10YR 4/4) or brown (10YR 4/3). The lower part of the solum is dark brown (10YR 3/3) in places. The texture of this horizon generally is sandy loam, but layers of sandy clay loam, less than 10 inches thick, occur in some places. Thin lenses of loam or sand occur in the B horizon in places.

The C horizon commonly is grayish brown (2.5Y 5/2), olive brown (2.5Y 4/4), or gray (N 5/0 or N 6/0) but ranges to dark grayish brown (10YR 4/2), brown (10YR 5/3), or dark yellowish brown (10YR 4/4). It is mottled with yellowish brown (10YR 5/6) and dark yellowish brown (10YR 4/4) mottles. Textures in the C horizon range from fine gravel and sand to gravelly loam. Finer textured lake clay or glacial till commonly occurs between depth of 5 and 9 feet.

Oshtemo soils are adjacent to the moderately well drained Haney soils and the somewhat poorly drained Digby soils in many places. In some places they are adjacent to the very poorly drained Millgrove soils. The Oshtemo soils have a coarser textured B horizon than the Haney, Digby, or Millgrove soils and lack the evidence of wetness associated with those nearby soils.

Ottokee Series

The Ottokee series consists of deep, sandy soils that are moderately well drained. These soils formed in sandy material on post glacial, sandy beach ridges and dunes. They are nearly level to gently sloping and occupy knolls and long ridges, principally in Washington, Liberty, and Harrison Townships.

In a representative profile of an Ottokee soil that is wooded, the surface layer is dark grayish brown fine sand about 4 inches thick. The upper part of the subsoil, between depths of 4 and 24 inches, is strong brown fine sand. Below a depth of 24 inches, the subsoil is light yellowish brown or brownish yellow fine sand to a depth of 77 inches, except for a layer of yellowish red loamy fine sand that lies between depths of 47 and 49 inches. Below a depth of 77 inches, the underlying material is calcareous, olive gray fine sand that extends to a depth of 81 inches or more.

Ottokee soils have rapid permeability, a low available moisture capacity, and a deep root zone. They have a very low capacity for the storage and release of plant nutrients, and they are subject to soil blowing when the surface is bare. They are medium acid to neutral in the upper part and less acid as depth increases.

Representative profile of Ottokee fine sand, 1 to 5 percent slopes, in a wooded area in Washington Township (SW¼NW¼NE¼SE¼ sec. 13, T. 6 N., R. 8 E.; laboratory data No. HN-87):

A1-0 to 4 inches, dark grayish brown (10YR 4/2, 6/2 dry) fine sand; very weak fine granular structure; very friable; strongly acid; abrupt wavy boundary.

B21-4 to 24 inches, strong brown (7.5YR 5/8) fine sand; single grain; loose; discontinuous thin gray layer at upper boundary; medium acid; clear wavy boundary.

B22-24 to 32 inches, brownish yellow (10YR 6/6) fine sand; few fine faint yellowish brown (10YR 5/4 or 5/6) mottles; single grain; loose; few dark yellowish brown (10YR 4/4) iron streaks; medium acid; clear wavy boundary.

B23-32 to 47 inches, brownish yellow (10YR 6/6) fine sand; common medium and coarse faint yellowish brown (10YR 5/4), brownish yellow (10YR 6/8), and light brownish gray (10YR 6/2) mottles occur below a depth of 40 inches; single grain; loose; few dark red (2.5YR 3/6) iron concretions; medium acid; clear irregular boundary.

B24t-47 to 49 inches, yellowish red (5YR 4/6) loamy fine sand; common fine distinct brownish yellow (10YR 6/6) and light brownish gray (10YR 6/2) mottles; very weak fine subangular blocky structure parting to massive; friable; some lenses of fine sand within the horizon; clay bridging evident on sand grains; slightly acid; abrupt wavy boundary.

B25-49 to 77 inches, light yellowish brown (10YR 6/4) fine sand; common medium and coarse distinct yellowish brown (10YR 5/8) and brownish yellow (10YR 6/8) mottles; single grain; loose; neutral; abrupt irregular boundary.

C-77 to 81 inches, olive gray (5Y 5/2) fine sand; common coarse distinct olive yellow (2.5Y 6/6) mottles; single grain; loose; neutral; gradual wavy boundary.

The solum ranges from about 40 to 90 inches in thickness, but its thickness typically is 50 to 80 inches. The depth to carbonates commonly coincides with the solum thickness, but in places the upper 12 to 24 inches of the C horizon is noncalcareous.

The A1 horizon in uncultivated areas is generally dark grayish brown (10YR 4/2) or dark brown (10YR 4/3), but in some places it ranges to very dark grayish brown (10YR 3/2, 6/2 dry).

The B2 horizon commonly is strong brown (7.5YR 5/8), brownish yellow (10YR 6/6), or light yellowish brown (10YR 6/4) in the upper part; it changes with depth to pale brown (10YR 6/3) or light brownish gray (10YR 6/2). The B horizon, within a depth of 40 inches, generally is mottled with yellowish brown (10YR 5/4 or 5/6), pale brown (l0YR 6/3), or brownish yellow (10YR 6/8). Light brownish gray (10YR 6/2) mottles occur below a depth of 40 inches. Common, fine or medium, yellowish red (5YR 5/6) iron stains are in the lower horizons in many places. Redder iron concretions also are common in many of the horizons. Thin, dark brown (7.5YR 4/4) lamellae (Bt horizons) occur in Ottokee soils at a depth of 30 to 50 inches. The lamellae vary in number, but their total thickness is less than 6 inches. The lamellae contain 5 to 8 percent more clay and slightly more silt than do the adjacent layers of sand, and most commonly they are loamy sand. The texture of the B2 horizon generally is fine sand, but in some places south of the Maumee River, medium sand is dominant in some layers.

The C horizon commonly is gray (10YR 5/1, N 5/0), grayish brown (10YR 5/2), or olive gray (5Y 5/2), but pale olive (5Y 6/3) and light brownish gray (10YR 6/2) also occur. The texture of this horizon generally is fine sand, but it is medium sand in some places. Silty clay or clay underlies the Ottokee soils at depths ranging from 5 feet to about 20 feet.

Ottokee soils are the moderately well drained member of a drainage sequence that includes the well drained Oakville soils, the somewhat poorly drained Tedrow soil, and the very poorly drained Granby soils. They are adjacent to each of those soils in many places. They also are adjacent to Seward soils in some places. Ottokee soils have a higher content of sand throughout than Seward soils and lack the finer textured IIB an IIC horizons that occur above a depth of 40 inches in those soils. Ottokee soils have a less thick Bt than the moderately well drained Galen soils.

Paulding Series

The Paulding series consists of nearly level soils that are poorly drained. These soils formed in clayey lacustrine sediment in broad areas on uplands in Pleasant and Ridgeville Townships.

In a representative profile of a Paulding soil that is cultivated, the plow layer is dark gray clay about 8 inches thick. The subsoil, between depths of 8 and 50 inches, is gray clay mottled with gray, dark yellowish brown, and yellowish brown. Below the subsoil, between depths of about 50 and 60 inches or more, the underlying material is gray, calcareous clay.

Paulding soils have very slow permeability in both the subsoil and the fine-textured underlying material. They are saturated with free water for significant periods in winter and in spring, and they dry out slowly in spring. Paulding soils have a medium available moisture capacity and mostly a moderately deep root zone when the water table is low in summer or has been lowered by artificial drainage. The root zone is neutral to mildly alkaline.

Representative profile of Paulding clay, in a cultivated field in Pleasant Township (SW¼NW¼SW¼SW¼ sec. 31, T. 3 N., R. 6 E.):

Ap-0 to 8 inches, dark gray (10YR 4/1) clay; weak fine angular blocky structure; firm; common roots; neutral; abrupt smooth boundary.

B21g-8 to 16 inches, gray (N 6/0) clay; many medium faint grayish brown (2.5YR 5/2) mottles and common fine distinct dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/4 or 5/6) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; very firm; few roots; continuous grayish brown (2.5Y 5/2) on vertical faces of peds; neutral; gradual smooth boundary.

B22g-16 to 30 inches, gray (N 5/0) clay; many medium faint grayish brown (2.5Y 5/2) mottles and common fine distinct dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; very firm; few roots; continuous dark gray (N 4/0) on vertical surface of peds; neutral; clear smooth boundary.

B23g-30 to 39 inches, gray (10YR 5/1 to N 5/0) clay; many medium distinct dark yellowish brown (10YR 4/4) mottles; moderate fine subangular blocky structure; very firm; few roots; continuous dark gray (N 4/0) on vertical surfaces of peds; neutral; diffuse smooth boundary.

B3g-39 to 50 inches, gray (10YR 5/1 to N 5/0) clay; medium distinct dark yellowish brown (10YR 4/4) mottles; weak fine subangular blocky structure parting to massive as depth increases; very firm; mildly alkaline; clear smooth boundary.

Cg-50 to 60 inches, gray (10YR 5/1) clay; greenish gray (5GY 6/1) and yellowish brown (10YR 5/4) mottles; massive and has some vertical cleavage; very firm; few pebbles; light gray (10YR 7/1) carbonate accumulations; moderately alkaline; calcareous.

The solum ranges from about 38 to 55 inches in thickness, but more commonly it is 45 to 55 inches thick. The depth to carbonates coincides with the solum thickness; however, vertical cleavage in places extends several inches into the substratum.

The Ap horizon commonly is about 8 inches thick, but its thickness ranges from 6 to 9 inches. Its color generally is dark gray (10YR 4/1) or dark grayish brown (10YR 4/2, 6/2 dry). The texture is clay.

The B horizon generally is gray (10YR 5/1, N 5/0, or N 6/0) but ranges to dark gray (10YR 4/1 or 5Y 4/1) or olive gray (5Y 5/2). Mottling is faint to distinct and dark yellowish brown (10YR 4/4), yellowish brown (10YR 5/6), and gray (N 5/0). Texture of the B horizon is clay, and the content of clay ranges from 60 to 80 percent.

The C horizon commonly is gray (10YR 5/1) or dark grayish brown (10YR 4/2) and has common, dark brown (10YR 4/3), greenish gray (5GY 6/1), and yellowish brown (10YR 5/4) mottles. The texture is clay, and the content of clay is 60 to 80 percent.

Paulding soils are the very poorly drained members of a drainage sequence that includes the somewhat poorly drained Roselms soils. They are adjacent to Roselms soils and to Latty soils in some places. They have a higher content of clay in the B horizon than the Latty soils. Paulding soils differ from Toledo soils in lacking a dark colored surface layer and in having a higher content of clay in the B horizon than those soils.

Rawson Series

The Rawson series consists of deep soils that are moderately well drained. These soils formed in water-deposited loamy material and the underlying lacustrine clay or clay glacial till. They are gently sloping and are on beach ridges, outwash plains, and stream terraces. Rawson soils have a contrasting clayey texture in the lower part of the subsoil and in the underlying material within a depth of 40 inches.

In a representative profile of a Rawson soil that is cultivated, the plow layer is dark brown sandy loam about 9 inches thick. The subsoil, between depths of 9 and 26 inches, is dark brown fine sandy loam and fine sandy clay loam; this is mottled below a depth of 15 inches with dark yellowish brown and light olive brown. Between depths of 26 and 30 inches, the subsoil is dark yellowish brown silty clay mottled with yellowish brown and olive gray. The underlying material, to a depth of 60 inches, is dark brown, calcareous clay.

Rawson soils have moderate permeability in the subsoil and very slow permeability in the fine-textured underlying material. They have a medium available moisture capacity and in most places a moderately deep root zone. They are saturated above the underlying material for short periods in winter and in spring. They commonly are strongly acid in the root zone unless they are limed.

Representative profile of Rawson sandy loam, 2 to 6 percent slopes, in a cultivated field in Freedom Township (SE¼NW¼SE¼NW¼ sec. 19, T. 6 N., R. 6 E.):

Ap1-0 to 3 inches, dark brown (10YR 4/3) sandy loam; weak fine subangular blocky structure parting to weak fine granular structure; friable; many roots; 5 percent fine gravel; neutral; abrupt smooth boundary.

Ap2-3 to 9 inches, dark brown (l0YR 4/3) sandy loam; weak medium subangular blocky structure parting to weak medium granular structure; friable; many roots; 5 percent fine gravel; neutral; clear smooth boundary.

B1t-9 to 12 inches, dark brown (7.5YR 4/4) fine sandy loam; weak medium subangular blocky structure; friable; common roots; thin patchy dark brown (10YR 3/3) clay films that occur principally in scattered pockets of reddish brown (5YR 4/4) fine sandy clay loam; 15 percent fine gravel; mildly alkaline; clear wavy boundary.

B2t-12 to 26 inches, dark-brown (7.5YR 4/4) fine sandy clay loam; common medium distinct dark yellowish brown (10YR 4/4) and light olive brown (2.5Y 5/4) mottles below a depth of 15 inches; moderate medium subangular blocky structure; firm; common roots; thin patchy dark brown (10YR 3/3) clay films on peds; about 20 percent fine gravel; mildly alkaline; abrupt smooth boundary.

IIB3t-26 to 30 inches, dark yellowish brown (10YR 4/4) silty clay; many medium distinct yellowish brown (10YR 5/6) and olive gray (5Y 5/2) mottles; strong medium angular blocky structure parting to strong fine angular blocky; very firm; thin patchy dark brown (7.5YR 3/2) clay films on peds; common roots; mildly alkaline; abrupt smooth boundary.

IIC-30 to 60 inches, dark brown (10YR 4/3) clay; many medium distinct yellowish brown (10YR 5/6) and gray (10YR 5/1) mottles; massive and has vertical cleavages; very firm; few fine roots; thin very patchy gray (5Y 5/1) clay films on vertical surfaces of cleavages; few light gray (10YR 7/2) limestones; calcareous.

The solum ranges from 26 to 42 inches in thickness. Generally, the depth to carbonates also is 26 to 42 inches. The contrasting fine-textured material occurs at depths ranging from about 22 to 42 inches. The gravel content in the solum ranges from about 2 to 20 percent.

The Ap horizon ranges from 6 to 9 inches in thickness. It generally is dark brown (10YR 4/3) or dark grayish brown (10YR 4/2). The texture of the Ap horizon is loam, fine sandy loam, or sandy loam, and these three textures are about equal in extent. An A2 horizon is in uncultivated areas.

The B horizon generally is dark brown (10YR 4/3 or 7.5YR 4/4) or dark yellowish brown (10YR 4/4) and is distinctly mottled with light olive brown (2.5YR 5/4), yellowish brown (10YR 5/4), or dark yellowish brown (10YR 3/4). The texture of the B horizon generally is sandy clay loam, but it ranges to clay loam, loam, and fine sandy loam. In some places, a layer of loamy sand or fine sand, 2 to 6 inches thick, occurs above the IIB3t horizon. This coarse-textured layer typically is discontinuous. The IIB horizon typically is dark yellowish brown (10YR 4/4), dark grayish brown (10YR 4;2), or gray (10YR 5/1), that is mottled with yellowish brown (10YR 5/4 or 5/6), pale brown (10YR 6/3), olive gray (5Y 5/2), and dark gray (10YR 4/1). It generally is silty clay or clay but ranges to clay loam. Clay coatings on the vertical surfaces of peds most commonly are in darker colors, generally dark brown (7.5YR 3/2) or dark grayish brown (10YR 4/2).

The C horizon commonly is dark brown (10YR 4/3) or brown (10YR 5/3) and is mottled with yellowish brown (10YR 5/6), pale brown (10YR 6/3), and gray (10YR 5/1). It generally is calcareous and ranges from clay to clay loam in texture.

The Rawson soils are the moderately well drained members of a drainage sequence that includes the somewhat poorly drained Haskins soils and the very poorly drained Mermill soils. They are commonly adjacent to those soils. In contrast to the moderately well drained Haney soils, Rawson soils are fine textured in the lower part of the B horizon and in the C horizon, whereas the Haney soils are coarser textured in the lower part or the B horizon and have a sandy and gravelly C horizon. They also differ from the moderately well drained Tuscola soils in being fine textured in the lower part of the B horizon and in the C horizon. Rawson soils lack the reddish colors that are inherent in the Vaughnsville soils.

Rimer Series

The Rimer series consists of nearly level, somewhat poorly drained soils that occupy slight rises on uplands, mainly south of the Maumee River. These soils formed in moderately thick sandy material and in the underlying lacustrine clay or clay glacial till. The boundary between these contrasting textures occurs within a depth of 40 inches.

In a representative profile of a Rimer soil that is cultivated, the plow layer is dark grayish brown loamy fine sand about 9 inches thick. The subsurface layer, between depths of 9 and 22 inches, is yellowish brown loamy fine sand that is distinctly mottled with dark brown, yellowish brown, and pale brown. The subsoil, which extends to a depth of 28 inches, is yellowish brown and has pale brown, light brownish gray, and grayish brown mottles. It is fine sandy loam in the upper part and silty clay in the lower part. The underlying material, between depths of 28 and 70 inches, consists of yellowish brown and gray, calcareous silty clay and clay.

Rimer soils have rapid permeability in the coarse-textured upper part and very slow permeability in the finer textured underlying material. The uppermost 20 to 40 inches commonly is saturated for long periods in winter and early in spring. These soils have a low to medium available moisture capacity and a moderately deep root zone. The root zone is mostly neutral or slightly acid, but in places it is strongly acid.

Representative profile of Rimer loamy fine sand, 0 to 2 percent slopes, in a cultivated field in Damascus Township (NW¼SW¼SE¼NW¼ sec. 12, T. 5 N., R. 8 E.) :

Ap-0 to 9 inches, dark grayish brown (10YR 4/2; 6/2 dry) loamy fine sand; weak fine granular structure; loose; neutral; abrupt smooth boundary.

A2-9 to 22 inches, yellowish brown (10YR 5/4) loamy fine sand; common medium distinct dark brown (7.5YR 4/4), yellowish brown (10YR 5/6), and pale brown (10YR 6/3) mottles; single grain; loose; neutral; clear smooth boundary.

B21t-22 to 24 inches, yellowish brown (10YR 5/4) fine sandy loam; common medium distinct yellowish brown (10YR 5/8) and light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; soft thin patchy dark brown (10YR 4/3) clay films on peds and clay bridging sand grains; neutral; clear smooth boundary.

IIB22t-24 to 28 inches, yellowish brown (10YR 5/4) silty clay; many medium distinct grayish brown (2.5YR 5/2), light brownish gray (10YR 6/2), and yellowish brown (10YR 5/6) mottles and common strong brown (7.5YR 5/6 and 5/8) mottles; moderate medium angular blocky structure; firm; moderate continuous dark grayish brown (10YR 4/2) clay films on vertical faces of peds and thin patchy clay films on horizontal faces; neutral; clear smooth boundary.

IIC1-28 to 34 inches, yellowish brown (10YR 5/4) silty clay; many medium distinct greenish gray (5GY 6/1) and yellowish brown (10YR 5/6) mottles; massive; firm; mildly alkaline; clear smooth boundary.

IIC2g-34 to 66 inches, gray (10YR 5/1) silty clay; common medium distinct yellowish brown (10YR 5/4) mottles; weak thick platy structure; firm; includes several thin strata or lenses of fine sand or silt; moderately alkaline; calcareous; clear smooth boundary.

IIIC3g-66 to 70 inches, gray (10YR 5/1) clay; many coarse distinct. Yellowish brown (10YR 5/4) mottles; massive; very firm; common limestone pebbles and shale fragments; moderately alkaline and calcareous.

The solum ranges from about 24 to 44 inches in thickness, but mostly it is 26 to 40 inches. The depth to carbonates normally is the same as the thickness of the solum, but in some places, several inches of the lower part of the solum are slightly calcareous. The fine textured IIB and IIC horizons occur at a depth ranging from about 22 to 40 inches but more commonly are at a depth of 24 to 38 inches.

The Ap horizon ranges from 6 to 10 inches in thickness. Its color generally is dark grayish brown (10YR 4/2, 6/2 dry) but ranges to dark gray (10YR 4/1) in some places.

The A2 horizon generally is pale brown (10YR 6/3) but ranges to yellowish brown (10YR 5/4). Mottling is distinct, dark brown (7.5YR 4/4), yellowish brown (10YR 5/6), pale brown (10YR 6/3), and light brownish gray (10YR 6/2). The texture is loamy fine sand or fine sand.

The B21t horizon is yellowish brown (10YR 5/4) or brown (7.5YR 4/4) and contains distinct, yellowish brown (10YR 5/8) and light brownish gray (10YR 6/2) mottles. The texture in this horizon is fine sandy clay loam. The thickness of the B21t horizon ranges from 2 to 8 inches.

The IIB horizon ranges from yellowish brown (10YR 5/4) to grayish brown (10YR 5/2) and contains distinct, light brownish gray (10YR 6/2), strong brown (7.5YR 5/6 or 5/8), and yellowish brown (10YR 5/6) mottles. Its texture normally is silty clay or clay but ranges to clay loam.

The C horizon commonly is gray (10YR 5/1), dark brown (10YR 4/3), or dark yellowish brown (10YR 4/4) and is mottled with yellowish brown (10YR 5/6), greenish gray (5GY 6/1), or grayish brown (10YR 5/2). It normally is calcareous and it ranges in texture from silty clay or clay to clay loam.

In this county the Rimer soils have less mottling and less gray colors in the subsoil than typical Rimer soils. These differences, however, do not greatly affect the use or behavior of the soils.

Rimer soils are the somewhat poorly drained members of a drainage sequence that includes the moderately well drained Seward soils and the very poorly drained Wauseon soils. They are adjacent to Seward soils in many places and to Wauseon soils in a few places. The Rimer soils differ from the somewhat poorly drained Tedrow soils because they are clayey in the lower part of the B horizon and in the C horizon, where as Tedrow soils are underlain by calcareous sands.

Roselms Series

The Roselms series consists of somewhat poorly drained soils that occupy nearly level to slight rises on uplands, only in Ridgeville Township. These soils formed in clayey lacustrine sediment.

In a representative profile of a Roselms soil that is cultivated, the plow layer is dark grayish brown silty clay loam about 6 inches thick. The subsoil, between depths of 6 and 25 inches, is dark grayish brown and brown clay mottled with yellowish brown, dark yellowish brown and gray. The underlying material, between depths of 25 and 72 inches, is dark grayish brown, calcareous clay.

Roselms soils have very slow permeability. They are seasonally saturated with free water for rather long periods. In spring, they dry out slowly unless they have been artificially drained. Roselms soils have a medium available moisture capacity and a root zone that is mostly moderately deep because the clayey subsoil hinders root growth. The root zone is medium acid or strongly acid unless it has been limed.

Roselms soils are used mostly for meadow and for cultivated crops. A few acres have been artificially drained to improve plant growth and to make fieldwork easier.

Representative profile of Roselms silty clay loam, 0 to 2 percent slopes, in a cultivated field in Ridgeville Township (SW¼SW¼ sec. 31, T. 6 N., R. 5 E.):

Ap-0 to 6 inches, dark grayish brown (10YR 4/2) silty clay loam; moderate medium subangular blocky structure; firm; many roots; strongly acid; abrupt smooth boundary.

B1tg-6 to 9 inches, dark grayish brown (10YR 4/2) clay; many fine distinct yellowish brown (10YR 5/6) and gray (10YR 5/1) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; very firm; common roots; very patchy light gray (10YR 7/1) silt coatings; thin patchy dark gray (10YR 4/1) clay films on peds; medium acid; gradual smooth boundary.

B21tg-9 to 13 inches, brown (10YR 4/3) clay; many fine distinct yellowish brown (10YR 5/4) mottles; moderate medium prismatic structure parting to moderate medium angular blocky structure; very firm; common roots; very patchy light gray (10YR 7/1) silt coatings; thin patchy dark grayish brown (10YR 4/2) clay films on peds; ped surfaces are dominantly 2 in chroma; medium acid; clear wavy boundary.

B22tg-13 to 25 inches, dark grayish brown (10YR 4/2) clay; many fine distinct yellowish brown (10YR 5/4) and dark yellowish brown (10YR 4/4) mottles; moderate coarse prismatic structure parting to moderate medium angular blocky; very firm; few roots; thin patchy dark grayish brown (10YR 4/2) clay films on peds; ped surfaces are dominantly 2 in chroma; few very dark gray (N 3/0) iron stains; mildly alkaline; gradual smooth boundary.

C1g-25 to 33 inches, dark grayish brown (10YR 4/2) clay; many fine distinct dark yellowish brown (10YR 4/4) mottles; weak coarse prismatic structure parting to weak medium subangular blocky; very firm; few roots; thin very patchy dark gray (10YR 4/1) clay films on vertical faces of peds; some medium and coarse quartz grains on ped surfaces; moderately alkaline; weakly calcareous; gradual wavy boundary.

C2g-33 to 60 inches, dark grayish brown (10YR 4/2) clay; many fine distinct dark yellowish brown (10YR 4/4) mottles; massive and has vertical cleavages; very firm; dark gray (N 4/0) and greenish gray (5G 6/1) coatings on vertical faces of cleavages; some medium and coarse quartz grains on cleavage surfaces; moderately alkaline and calcareous.

The thickness of the solum, and typically the depth to carbonates, ranges from about 22 to 32 inches.

The Ap horizon ranges from 5 to 8 inches in thickness. Its color generally is dark grayish brown (10YR 4/2) but ranges to dark gray (10YR 4/1) or grayish brown (10YR 5/2). Texture of the A horizon is silty clay loam. A silty clay A2 horizon occurs in uncultivated areas and areas of shallow plowed soils.

The B horizon is brown (10YR 4/3), dark grayish brown (10YR 4/2), or grayish brown (10YR 5/2) and contains gray (10YR 5/1), pale brown (10YR 6/3), dark yellowish brown (10YR 4/4), and yellowish brown (10YR 5/4 or 5/6) mottles. The B horizon is clay and has a clay content that ranges from 60 to 75 percent.

The C horizon commonly is dark grayish brown (10YR 4/2), light brownish gray (10YR 6/2), or grayish brown (10YR 5/2) and contains dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/4) mottles. This horizon is chiefly clay and has a clay content of more than 60 percent; however, in some places, silty clay occurs in the lower part of the C horizon.

Roselms soils are the somewhat poorly drained members of a drainage sequence that includes the very poorly drained Paulding soils, which commonly are adjacent to them. Roselms soils are also adjacent to the somewhat poorly drained Fulton and Nappanee soils in some areas. The Roselms soils have a higher content of clay in the B horizon than Fulton soils. They differ from Nappanee soils in having a higher clay content in the B horizon and in having formed in lacustrine sediment rather than glacial till.

Ross Series

The Ross series consists of nearly level, dark-colored soils that are well drained. These soils formed in loamy alluvial material on flood plains along the Maumee River. They are flooded during periods of stream overflow, mainly in winter, but flooding can occur in other seasons as well.

In a representative profile of a Ross soil that is cultivated, the plow layer is very dark grayish brown loam about 10 inches thick. The lower part of the surface layer, between depths of 10 and 36 inches, is very dark grayish brown and dark brown loam and silt loam. The underlying material, between depths of 36 and 61 inches or more, is brown, calcareous silt loam.

Ross soils are moderately permeable throughout. They have a high available moisture capacity and a deep root zone. They are mostly neutral to mildly alkaline.

Representative profile of Ross loam, in a cultivated field in Liberty Township (SE¼NW¼NE¼NW¼ sec. 11, T. 5 N., R. 7 E.):

Ap1-0 to 6 inches, very dark grayish brown (10YR 3/2, 3/2 rubbed) loam; weak medium subangular blocky structure parting to moderate medium granular; friable; many roots; neutral; abrupt smooth boundary.

Ap2-6 to 10 inches, very dark grayish brown (10YR 3/2, 3/2 rubbed) loam; moderate thick platy structure parting to weak fine angular blocky; friable; many roots; neutral; abrupt smooth boundary.

A11-10 to 21 inches, very dark grayish brown (10YR 3/2, 3/2 rubbed) loam; weak fine subangular blocky structure; friable; common roots; mildly alkaline; clear smooth boundary.

A12-21 to 32 inches, dark brown (10YR 3/3, 3/3 rubbed) silt loam; weak medium subangular blocky structure; firm; common roots; very dark grayish brown (10YR 3/2) ped faces; mildly alkaline; gradual smooth boundary.

A13-32 to 36 inches, dark brown (10YR 3/3, 3/3 rubbed) silt loam; weak fine subangular blocky structure; friable; few roots; very dark grayish brown (10YR 3/2) on ped faces; few shells; moderately alkaline; gradual wavy boundary.

C1-36 to 52 inches, brown (10YR 4/3) silt loam; weak medium subangular blocky structure; friable; few roots; dark brown (10YR 3/3) on ped surfaces; few shells; moderately alkaline; calcareous; gradual smooth boundary.

C2-52 to 61 Inches, brown (10YR 4/3) silt loam; weak medium subangular blocky structure parting to massive; friable; moderately alkaline and calcareous.

The depth to carbonates commonly is the same as the depth to the C horizon.

The dark-colored A horizon generally is 24 to 36 Inches thick, but in some places it is 40 inches thick. Its colors commonly are very dark grayish brown (10YR 3/2), dark brown (10YR 3/3), and in places, very dark brown (10YR 2/2). Rubbed colors have a chroma of 3 or less.

The C horizon commonly is brown (10YR 4/3 or 5/3) but ranges to dark grayish brown (10YR 4/2) and dark yellowish brown (10YR 4/4). Texture of the C horizon is silt loam or loam. In many places the C horizon is stratified, and layers of sandy loam, loamy sand, and sand and gravel are common.

Ross soils are the well drained members of a drainage sequence that includes the moderately well drained Medway soils, which commonly are adjacent to these soils. Ross soils are also adjacent to the lighter colored Genessee and Shoals soils and to the wetter Sloan soils. Ross soils resemble the dark-colored Sloan soils, but they lack a B horizon that has gray colors and mottling, which indicate a fluctuating high water table. They have a darker colored A horizon than the Shoals soils and lack the mottling that is common in those soils.

St. Clair Series

The St. Clair series consists of deep, gently sloping to very steep, moderately well drained soils on slope breaks along streams and drainageways that dissect the county. These soils formed in clay loam or clay glacial till.

In a representative profile of a St. Clair soil that is in permanent pasture, the surface layer is very dark grayish brown and dark grayish brown silty clay loam about 5 inches thick. The subsoil, between depths of 5 and 23 inches, is dark yellowish-brown clay that is faintly mottled with yellowish brown and gray in the lower part. The underlying material, between depths of 23 and 60 inches, is brown and dark yellowish-brown clay, glacial till. The upper 12 to 24 inches of this material is partially weathered, but most of it is compact and limy. It contains pebbles and fragments of limestone and shale.

St. Clair soils have very slow permeability. They are seasonally saturated for short periods. The available moisture capacity is medium, and the root zone is mostly moderately deep. These soils are medium acid to neutral in the root zone.

Representative profile of St. Clair silty clay loam, 6 to 12 percent slopes, moderately eroded, in permanent pasture in Richfield Township (NW¼NE¼SW¼SE¼ sec. 1, T. 4 N., R. 8 E.):

Ap1-0 to 2 inches, very dark grayish brown (10YR 3/2, 3/2 rubbed) silty clay loam; moderate fine

granular structure; slightly hard; many roots; slightly acid; clear smooth boundary.

Ap2-2 to 5 inches, dark grayish brown (10YR 4/2) silty clay loam; moderate fine subangular blocky structure; friable; many roots; slightly acid; abrupt smooth boundary.

B21t-5 to 9 inches, dark yellowish brown (10YR 4/4) light clay; moderate coarse prismatic structure parting to moderate medium subangular blocky structure; very firm; common roots; thin patchy dark brown 10YR 3/3) clay films; slightly acid; clear smooth boundary.

B22t-9 to 16 inches, dark yellowish brown (10YR 4/4) clay; few fine faint yellowish brown (10YR 5/6) mottles; moderate coarse prismatic structure parting to strong medium subangular blocky structure; very firm; common roots; medium continuous dark- brown (10YR 3/3) clay films; common fine fragments of limestone and shale; slightly acid; gradual wavy boundary.

B3t-16 to 23 inches, dark yellowish brown (10YR 4/4) clay; common medium faint yellowish brown (10YR 5/6) mottles and few greenish gray (5GY 6/1) mottles; moderate medium prismatic structure parting to strong medium angular blocky structure; very firm; few roots; medium continuous dark grayish-brown (10YR 4/2) clay films; common medium distinct gray (10YR 5/1) and greenish gray (5GY 6/1) mottles on faces of peds; moderately alkaline; gradual wavy boundary.

C1-23 to 35 inches, brown (10YR 4/3) clay; common medium distinct gray (10YR 5/1) and yellowish brown (10YR 5/6) mottles; moderate fine angular blocky structure; very firm; few roots; thin patchy dark grayish-brown (10YR 4/2) clay films on vertical faces of peds, very patchy on horizontal faces; few fine black (N 2/5) iron and manganese stains; numerous fine fragments of limestone and shale; moderately alkaline; calcareous; gradual wavy boundary.

C2-35 to 60 inches, dark yellowish brown (10YR 4/4) clay; common fine faint yellowish brown (10YR 5/6) and grayish brown (2.5Y 5/2) mottles; massive and has vertical cleavages; very firm; thin patchy dark grayish brown (10YR 4/2) clay coatings on vertical faces of cleavages; numerous fragments of limestone and shale; moderately alkaline and calcareous.

The thickness of the solum commonly is 18 to 30 inches. In many places much of the solum has been eroded away. The depth to carbonates commonly is the same as the thickness of the solum, but in some places the solum extends into the calcareous material for several inches.

The Ap horizon commonly is 4 to 8 inches thick where these soils are not severely eroded. In severely eroded areas, the A horizon is either completely missing or is only 1 to 3 inches thick. The Ap horizon commonly is dark grayish brown (10YR 4/2) or grayish brown (10YR 5/2), and its dominant texture is silty clay loam, except on severely eroded areas, where it is silty clay. An A2 horizon occurs in the profile in uncultivated, uneroded areas.

The B horizon color generally is dark yellowish brown (10YR 4/4), brown (10YR 5/3), or dark brown (10YR 4/3). Mottling is faint yellowish brown (10YR 5/6) in the B22 horizon. A few greenish gray (5GY 6/1) mottles are in the lower part of the B horizon. Some pale brown (10YR 6/3), patchy silt coatings occur in the B21t horizon in some places. Texture of the B horizon is clay, and the clay content ranges from 40 to 46 percent.

The C horizon generally is brown (10YR 4/3) or dark yellowish brown (10YR 4/4) and is distinctly mottled with gray (10YR 5/1), yellowish brown (10YR 5/6), and grayish brown (2.5Y 5/2). This horizon is light clay or clay loam in some places, and it has a clay content ranging from about 36 to 44 percent.

St. Clair soils are the moderately well drained members of a drainage sequence that includes the somewhat poorly drained Nappanee soils and the very poorly drained Hoyville soils. They are adjacent to the Nappanee soils in areas that have well-developed drainageways. They are also adjacent to Hoytville soils in some areas. The St. Clair soils commonly are adjacent to the moderately well drained Lucas soils in some places. They differ from Lucas soils in having pebbles and fragments of limestone throughout the soil.

Seward Series

The Seward series consists of deep, gently sloping to moderately steep, moderately well drained soils on knolls and long ridges on uplands, mainly south of the Maumee River. These soils formed in moderately thick sandy material and the underlying lacustrine clay or clay glacial till.

In a representative profile of a Seward soil that if, cultivated, the plow layer is dark grayish brown loamy fine sand about 10 inches thick. The subsurface layer, between depths of 10 and 26 inches, is mottled, yellowish brown loamy fine sand in the upper 11 inches and mottled, dark brown loamy fine sand in the lower 5 inches. The upper part of the subsoil, between depths of 26 and 34 Inches, is mottled, yellowish brown sandy loam. The lower part of the subsoil, between depths of 34 and 44 inches, is mottled, dark yellowish-brown clay. The underlying material, to a depth of 60 inches, is mottled, dark-brown, calcareous clay.

Seward soils commonly have rapid permeability in the coarse-textured upper part of the profile and slow permeability in the clayey underlying material. Permeability is variable in the underlying material of the Seward soils that have a stratified substratum. All the Seward soils have low to medium available moisture capacity and a root zone that mainly is moderately deep. The root zone is strongly acid to neutral in the upper 20 inches.

Representative profile of Seward loamy fine sand, 2 to 6 percent slopes, in a cultivated field in Ridgeville Township (SW¼SW¼SE¼SE¼ sec. 34, T. 6 N., R. 5 E.):

Ap-0 to 10 inches, dark grayish brown (10YR 4/2) loamy fine sand; weak fine granular structure; friable; many roots; slightly acid; abrupt smooth boundary.

A21-10 to 21 inches, yellowish brown (10YR 5/4) loamy fine sand; few fine faint dark yellowish brown (10YR 4/4) mottles in lower part; single grain; very friable; common roots; few fine pebbles; slightly acid; clear wavy boundary.

A22-21 to 26 inches, dark brown (7.5YR 4/4) loamy fine sand; many fine distinct pale brown (10YR 6/3), yellowish brown (10YR 5/4), and dark yellowish brown (10YR 4/4) mottles; weak, medium, subangular blocky structure; friable; few roots; few fine black (5YR 2/1) iron and manganese stains; few fine pebbles; slightly acid; gradual wavy boundary.

B22t-26 to 34 inches, yellowish brown (10YR 5/4) sandy loam; many medium distinct pale brown (10YR 6/3) and dark brown (7.5YR 4/4) mottles; weak medium subangular blocky structure; friable; thin patchy brown (10YR 4/3) clay films on peds and in root channels; neutral; abrupt smooth boundary.

IIB23t-34 to 44 inches, dark yellowish brown (10YR 4/4) clay; many fine distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure in upper part, massive and has vertical cleavages in lower part; very firm; thin patchy dark brown (10YR 3/3) clay films on peds and in vertical cleavages; mildly alkaline; gradual wavy boundary.

IIC-44 to 60 inches, dark brown (10YR 4/3) clay; common fine distinct gray (10YR 6/1) mottles; massive and has vertical cleavages; very firm; gray (5YR 5/1) and greenish gray (5GY 6/1) films on faces of vertical cleavages; few light gray (10YR 7/1) lime blotches; mildly alkaline; calcareous.

The solum ranges from about 26 to 44 inches in thickness. The depth to carbonates generally is about 26 to 44 inches, but in places several inches of the lower part of the solum is lightly calcareous. The fine-textured IIB and C horizons are at a depth that ranges from about 22 to 40 inches, but they commonly are at a depth of 24 to 36 inches.

The Ap horizon is 8 to 10 inches thick and generally is dark grayish brown (10YR 4/2), but it ranges to dark gray (10YR 4/1) in places. The A2 horizon is yellowish brown (10YR 5/4) or dark brown (7.5YR 4/4) and loamy fine sand or fine sand.

The B horizon is dark brown (7.5YR 4/4) and is mottled with pale brown (10YR 6/3). dark yellowish brown (10YR 4/4), and yellowish brown (10YR 5/4). The texture is loamy fine sand, fine sandy loam, and light sandy clay loam. The upper part of the horizon ranges from 2 to 20 inches in thickness. The IIB horizon is commonly dark yellowish brown (10YR 4/4) or dark brown (10YR 4/3) and is mottled with yellowish brown (10YR 5/6) and gray (5Y 6/1, 10YR 5/1). The texture generally is silty clay or clay but ranges to clay loam. The thickness ranges from 2 to 15 inches.

The C horizon generally is dark brown (10YR 4/3), brown (10YR 5/3), or dark grayish brown (10YR 4/2) mottled with gray (10YR 6/1) but is yellowish brown (10YR 5/4) in places. It generally is calcareous silty clay or clay but is calcareous clay loam in places.

The Seward soils are the moderately well drained members of a drainage sequence that includes the somewhat poorly drained Rimer soils and the very poorly drained Wauseon soils. They are adjacent to the Rimer soils is many places and to Wauseon soils in some areas. Seward soils are finer textured in the lower part of the B horizon and in the clay C horizon than Ottokee and Galen soils, which formed in thick sands.

Shinrock Series, Sandy Subsoil Variant

The Shinrock series, sandy subsoil variant, consists of deep soils that are moderately well drained to well drained. These soils formed in loamy material that overlies sandy or sandy and gravelly material. They are nearly level and are on uplands of the lake plain, mainly in Flatrock Township near the slope breaks on the south side of the Maumee River.

In a representative profile of a Shinrock, sandy subsoil variant, soil that is cultivated, the plow layer is dark grayish-brown silt loam about 9 inches thick. The upper part of the subsoil, between depths of 9 and 21 inches, is dark yellowish brown silt loam and silty clay loam. The lower part of the subsoil is brown silty clay loam and light clay loam mottled with dark yellowish brown and grayish brown. The underlying material, between depths of 37 and 82 inches, is slightly acid to neutral, brown and dark-brown coarse sand.

Shinrock, sandy subsoil variant, soils have moderately slow permeability in the subsoil and rapid permeability in the underlying material. They are seasonally saturated for short periods in winter and spring. They have medium available water capacity and a deep root zone.

Unless they have been limed, these soils are medium acid to strongly acid in the upper 24 inches.

Representative profile of Shinrock silt loam, sandy subsoil variant, 0 to 2 percent slopes, in a cultivated field in Flatrock Township (NE¼SE¼SW¼NE¼ sec. 8, T. 4 N., R. 6 E.):

Ap-0 to 9 inches, dark grayish brown (10YR 4/2) silt loam; weak medium subangular blocky structure parting to moderate medium granular structure; friable; many roots; mildly alkaline; abrupt smooth boundary.

B1-9 to 16 inches, dark yellowish brown (10YR 4/4) silt loam; very weak prismatic structure parting to moderate, medium subangular blocky structure; firm; common roots; thin very patchy dark brown (7.5YR 4/4) clay films on vertical faces of peds; thin patchy brown (10YR 5/3, 6/3 dry) silt coatings on ped surfaces; strongly acid; gradual smooth boundary.

B21t-16 to 21 inches, dark yellowish brown (10YR 4/4) silty clay loam; weak medium prismatic structure parting to moderate medium angular blocky structure; firm; common roots; thin very patchy dark brown (7.5YR 4/4) clay films on peds; thin very patchy brown (10YR 5/3, 6/3 dry) silt coatings on ped surfaces; strongly acid; clear smooth boundary.

B22t-21 to 28 inches, brown (10YR 4/3) silty clay loam; common, fine faint dark yellowish brown (10YR 4/4) and grayish brown (2.5YR 5/2) mottles; weak medium prismatic structure parting to moderate medium angular blocky structure; very firm; common roots; thin patchy brown (10YR 5/3, 6/3 dry) silt coatings on ped surfaces; strongly acid; abrupt smooth boundary.

IIB3-28 to 37 inches, brown (7.5YR 4/4) light clay loam: common fine faint dark yellowish brown (10YR 4/4) and grayish brown (2.5Y 5/2) mottles; weak coarse prismatic structure parting to moderate coarse subangular blocky structure; very firm; few roots; thin very patchy dark brown (7.5YR 3/2) clay films and clay bridging of sand grains on vertical faces of peds; structural units coated with coarse sandy loam 2 to 7 millimeters thick; 5 percent fine pebbles; strongly acid; gradual wavy boundary.

IICI-37 to 47 inches, brown (7.5YR 4/4) coarse sand; many fine faint grayish brown (2.5YR 5/2) and dark yellowish brown (10YR 4/4) mottles; single grain; loose; slightly acid; gradual smooth boundary.

IIC2-47 to 77 inches, dark brown (10YR 4/3) coarse sand; common fine faint. dark grayish brown (10YR 4/2) mottles; single grain; loose; slightly acid; gradual smooth boundary.

IIC3-77 to 82 inches, dark brown (10YR 4/3) coarse sand; many fine faint dark grayish brown (10YR 4/2) mottles; single grain; loose; neutral; clear smooth boundary.

The solum ranges from 32 to 48 inches in thickness, but it is 36 to 42 inches thick in most places. Carbonates generally are 2 to 4 feet below the solum, but in some places they are deeper. The depth to the sandy horizons generally is the same as the thickness of the solum.

The Ap horizon generally is dark grayish brown (10YR 4/2) or brown (10YR 4/3 or 5/3). An A2 horizon occurs in uncultivated areas where plowing has not destroyed it.

The B horizon generally ranges from dark yellowish brown (10YR 4/4) to brown or dark brown (10YR 4/3), but it ranges to brown (10YR 5/3) or yellowish brown (10YR 5/4) in some places. Faint, grayish brown (2.5YR 5/2), dark yellowish brown (10YR 4/4), and yellowish brown (10YR 5/4 to 5/6) mottles occur in the lower part of the solum, commonly between depths of 20 and 32 inches. The B horizon generally is silty clay loam, but it ranges to light silty clay or clay loam and in some places the upper part of the B horizon is silt loam. The content of clay ranges from more than 25 to about 42 percent in the upper part of the Bt horizon.

The C horizon commonly is brown to dark brown (7.5YR 4/4) or dark yellowish brown (10YR 4/4) and has grayish-brown (2.5Y 5/2), dark grayish-brown (10YR 4/2), and dark yellowish-brown (10YR 4/4) mottles. This horizon is coarse sand, medium sand, and sand and gravel. In some places thin strata of silty clay loam or coarser material occur in the C horizon. In most places these strata are only a few inches thick. The C horizon ranges from neutral to moderately alkaline.

Shinrock, sandy subsoil variant, soils are the moderately well drained to well drained members of a drainage sequence that includes the somewhat poorly drained Del Rey soils and the very poorly drained Lenawee soils. They are adjacent to the Del Rey and Lenawee soils in a few places, but more commonly they are adjacent to the soils of other drainage sequences. The Shinrock, sandy subsoil variant, soils have a higher content of clay in the B horizon than the moderately well drained Tuscola soils. They have a lower content of clay in the B horizon than the moderately well drained Lucas soils.

Shoals Series

The Shoals series consists of deep, nearly level, somewhat poor1y drained soils. These soils formed in loamy sediment on flood plains along the Maumee River and its tributaries. They are subject to flooding, especially in winter and at other times of the year after periods of rainfall.

In a representative profile of a Shoals soil that is cultivated, the plow layer is dark grayish brown silt loam about 10 inches thick. The subsoil, between depths of 10 inches and 31 inches, is dark grayish brown slit loam and loam mottled with dark gray, grayish brown, and dark brown. The underlying material, between depths of 31 and 60 inches, is grayish brown loam that has olive gray and dark reddish brown mottles.

Shoals soils are moderately permeable throughout. They have a seasonally high water table for a significant period of time, and they are slow to dry out in the spring unless they have been artificially drained. They have high available moisture capacity, and the root zone is deep when the water table is low in summer. They are slightly acid to mildly alkaline.

Representative profile of Shoals silt loam, in a cultivated field in Liberty Township (SE¼SE¼NW¼SW¼ sec. 35, T. 6 N ., R. 7 E.):

Ap1-0 to 5 inches, dark grayish brown (10YR 4/2) silt loam; moderate medium granular structure; friable; common roots; mildly alkaline; abrupt, smooth boundary.

Ap2-5 to 10 inches, dark grayish brown (10YR 4/2) silt loam; weak coarse angular blocky structure; friable; common roots; ped surfaces are slightly darker than the matrix; mildly alkaline; abrupt smooth boundary.

B1g-10 to 13 inches, dark grayish brown (10YR 4/2) silt loam; common fine faint dark gray (10YR 4/1) and grayish brown (10YR 5/2) mottles; weak coarse angular blocky structure parting to weak medium angular blocky structure; friable; common roots; mildly alkaline; clear smooth boundary.

B2g-13 to 31 inches, dark grayish brown (10YR 4/2) loam; common medium faint grayish brown (2.5YR 5/2) mottles and many medium distinct dark-brown (7.5YR 4/4) mottles; weak medium subangular blocky structure; friable; few roots; few dark-gray (10YR 4/1) mottles on peds; few pockets of brown (10YR 5/3) fine sandy loam; mildly alkaline; gradual wavy boundary.

Cg-31 to 60 inches, grayish brown (10YR 5/2) loam; common medium faint olive gray (5Y 5/2) mottles and many fine distinct dark reddish brown (5YR 3/3) mottles; massive; friable; some dark gray (10YR 4/1) mottles on peds and in root channels; moderately alkaline; calcareous.

The thickness of the solum ranges from 24 to about 40 inches but is commonly 26 to 36 inches. The depth to carbonates commonly is the same as the thickness of the solum. In some places the C horizon is only mildly alkaline to a depth of 1 foot or more.

The Ap horizon typically is 7 to 10 inches thick, but in some places where surface deposition has occurred, this horizon is as much as 12 inches thick. It generally is dark grayish brown (10YR 4/2) or grayish brown (10YR 5/2) but ranges to brown (10YR 4/3) or gray (10YR 5/1) in a few places.

The B horizon is dark grayish brown (10YR 4/2), grayish brown (10YR 5/2), or light brownish gray (10YR 6/2). It is mottled with faint and distinct, grayish brown (2.5Y 5/2), dark gray (10YR 4/1), dark brown (10YR 4/3 or 7.5YR 4/4), and yellowish brown (10YR 5/4 or 5/6) mottles. The B horizon generally is silt loam or loam but ranges to light silty clay loam or light clay loam. Lenses of sandy loam, loamy sand, or sand occur in the lower part of the B horizon in some places.

The C horizon commonly is grayish brown (10YR 5/2), light brownish gray (10YR 6/2), or dark gray (10YR 4/1). The upper layers are either neutral or mildly alkaline and calcareous and they are silt loam, loam, light silty clay loam, or light clay loam. In some places the horizon is stratified, and strata of coarser material are common. These strata range from sandy loam to sand or sand and gravel. Silty clay or clay commonly is at depths of 4 to 10 feet.

Shoals soils are the somewhat poorly drained members of a drainage sequence that includes the very poorly drained Sloan soils and the well drained Genesee soils. They are adjacent to those soils in many places. They are grayer throughout than Genesee soils and lack the dark color in the surface layer of Sloan soils. They have a lighter surface layer than well drained Ross soils and moderately well drained Medway soils.

In this county the Shoals soils are more alkaline than typical Shoals soils in other survey areas. This slight difference, however, does not greatly affect the use or behavior of these soils.

Sloan Series

The Sloan series consists of dark-colored, very poorly drained soils in level to depressional areas on flood plains. These soils formed in loamy sediment on the flood plains along the Maumee River and its tributaries and along other streams in the county. Sloan soils are flooded during periods of high water, primarily in winter, but flooding can occur during any season of the year.

In a representative profile of a Sloan soil that is in pasture, the surface layer is very dark grayish-brown silty clay loam about 12 inches thick. The subsoil, between depths of 12 and 43 inches, is grayish-brown silty clay loam that is distinctly mottled with dark brown, reddish brown, and yellowish brown. The underlying material, between depths of 43 and 72 inches, is mottled, grayish-brown silt loam.

Sloan soils have moderate permeability. They have a seasonally high water table for long periods in winter and spring. Unless adequately drained, they are slow to dry out in spring. Sloan soils have a high available moisture capacity and a deep root zone. The root zone typically is mildly alkaline in reaction.

Representative profile of Sloan silty clay loam, in permanent pasture in Liberty Township (NW¼NE¼NE¼SE¼ sec. 32, T. 6 N., R. 7 E.) :

A11-1 to 3 inches, very dark grayish brown (10YR 3/2, 3/2 rubbed) silty clay loam; moderate medium granular structure; friable; many roots; mildly alkaline; abrupt smooth boundary.

A12-3 to 7 inches, very dark grayish brown (10YR 3/2, 3/2 rubbed) silty clay loam; weak very fine subangular blocky structure parting to moderate medium granular structure; soft; many roots; mildly alkaline; clear smooth boundary.

A13-7 to 12 inches, very dark grayish brown (10YR 3/2, 3/2 rubbed) silty clay loam; few fine distinct yellowish brown (10YR 5/4) mottles; weak fine subangular blocky structure; soft; common roots; mildly alkaline; gradual smooth boundary.

B21g-12 to 18 inches, grayish brown (2.5Y 5/2) silty clay loam; common fine distinct dark brown (7.5YR 4/4) mottles; weak fine angular blocky structure; friable; common roots; many gray (10YR 5/1) mottles on peds; dark grayish brown (10YR 4/2) coatings in vertical root channels; mildly alkaline; gradual smooth boundary.

B22g-18 to 30 inches, grayish brown (2.5YR 5/2) silty clay loam; common medium distinct dark brown (7.5YR 4/4) and reddish brown (5YR 4/4) mottles; weak medium subangular blocky structure; friable: few roots; common gray (10YR 5/1) mottles on faces of peds; mildly alkaline; gradual smooth boundary.

B23g-30 to 43 inches, grayish-brown (2.5YR 5/2) light silty clay loam; common, fine, distinct, dark-brown (7,5YR 4/4) mottles; weak, coarse, angular blocky structure; friable; few roots; common gray (10YR 5/1) mottles on surface of peds; mildly alkaline; gradual wavy boundary.

Cg-43 to 72 inches, grayish-brown (2.5YR 5/2) silt loam; common fine distinct dark yellowish-brown (10YR 4/4) and yellowish-brown (10YR 5/6) mottles; massive and has some vertical faces; friable; continuous gray (10YR 5/1) coatings or mottles on vertical faces; moderately alkaline and weakly calcareous.

The solum ranges from about 80 to 55 inches in thickness but commonly is 86 to 45 inches thick. The depth to carbonates commonly is the same as the thickness of the solum, but in some places the C horizon is noncalcareous for 1 foot or more. The reaction of the upper part of the solum is slightly acid to mildly alkaline. The lower part of the solum is normally neutral to mildly alkaline.

The dark-colored A horizon is thicker than 10 inches, generally ranging from 10 inches to about 18 inches in thickness. Colors commonly are very dark grayish brown (10YR 8/2) to very dark gray (10YR 8/1), but they range to very dark brown (10YR 2/2) in some places.

The B horizon is grayish brown (2.5YR 5/2), olive gray (5YR 5/2), gray (10YR 5/1), and dark gray (10YR 4/1). It is distinctly mottled with dark brown (7.5YR 4/4), reddish brown (5YR 4/4), and yellowish brown (10YR 5/4). Textures of the B horizon include silty clay loam, silt loam, and clay loam. The average sand content of the B horizon is more than 15 percent fine sand or coarser. Lenses of sandy loam, loamy sand, or sand occur in the lower part of the B horizon in some places.

The C horizon commonly is grayish brown (2.5YR 5/2), light brownish gray (10YR 6/2), or dark gray (10YR 4/1). The upper part of this horizon is either neutral or mildly alkaline and calcareous and consists of silt loam, loam, or light silty clay loam. In many places the C horizon is stratified and strata of coarser textured material are common. These strata range from sandy loam to sand or sand and gravel.

Sloan soils are the very poorly drained members of a drainage sequence that includes the somewhat poorly drained Shoals soils and the well-drained Genesee soils. They are adjacent to those soils in many places. The Sloan soils are more gray and mottled than Medway and Ross soils, which are also dark colored but are better drained. Sloan soils are less clayey in the B horizon than the very poorly drained Wabasha soils. They are more clayey than the very poorly drained Cohoctah soils.

Spinks Series

The Spinks series consists of deep, gently sloping to moderately steep, sandy soils that are principally in Harrison and Liberty Townships. These well-drained soils formed in sandy material on beach ridges and dunes.

In a representative profile of a Spinks soil that is cultivated, the plow layer is dark grayish-brown fine sand about 6 inches thick. Next is yellowish brown fine sand that extends from a depth of 6 inches to a depth of 100 inches. At various depths throughout this material are thin bands of dark brown loamy sand. These thin bands have a higher content of clay than the adjacent yellowish brown fine sand. The substratum,. Between depths of 100 and 153 inches, consists of layers of calcareous fine sand.

Spinks soils have moderately rapid permeability. The bands of loamy sand tend to slow the downward movement of water. Spinks soils have a very low available moisture capacity and a deep root zone. The root zone is medium acid to neutral.

Representative profile of Spinks fine sand, 6 to 12 percent slopes, in a sand pit in a previously cultivated field in Harrison Township (SE¼SE¼NW¼NE¼ sec. 13, T. 5 N., R. 7 E.; laboratory data No. HN-86):

Ap-0 to 6 inches, dark grayish brown (10YR 4/2) fine sand; very weak medium granular structure; loose; many roots; slightly acid; abrupt smooth boundary.

A2 & Bt-6 to 100 inches, yellowish brown (10YR 5/4) sand; single grain; loose; common roots to a depth of 55 inches, few roots below 55 inches; Bt part has thin lamellae of dark brown (7.5YR 4/4) loamy sand, 1/8 to 1/2 inch thick, at depths of 23, 28, 33, 39, 42, 44, 52, 55, 61, 66, 73, 79, 81, 92, and 96 inches; massive; friable; sand grains are coated, and there is clay bridging between grains; most lamellae are continuous but some are not; their boundaries are variable; some are abrupt and smooth, some abrupt and wavy, and some abrupt and irregular; the, lowermost lamella, at a depth of 96 inches, is 3 to 5 inches thick; slightly acid; abrupt, irregular boundary.

C1-100 to 114 inches, light yellowish brown (10YR 6/4) , fine sand; single grain; loose; moderately alkaline: and calcareous; diffuse wavy boundary.

C2-114 to 153 inches, pale brown (10YR 6/3) fine sand; few medium distinct yellowish brown (10YR 5/6) and light olive brown (2.5YR 5/6) mottles; single grain; loose; moderately alkaline; calcareous.

The solum ranges from about 60 to 100 inches in thickness. Depth to carbonates commonly is 6 to 48 inches below the solum.

The Ap horizon generally is dark grayish brown (10YR 4/2) but ranges to dark brown (10YR 4/3).

The A2 horizon commonly is yellowish brown (10YR 5/4) or brown (10YR 5/3). The dominant texture in this horizon, is fine sand, but loamy fine sand and sand occur in some places.

The colors of the Bt lamellae are typically dark brown (7.5YR 4/4) or strong brown (7.5YR 5/6). These lamellae, are commonly loamy sand or loamy fine sand. In some profiles, however, individual bands are of fine sandy loam. The lamellae commonly are about 1/8 inch thick but range to 5 inches in thickness. The minimum depth to the first band is about 20 inches in some places, but it commonly is 24 to 28 inches. The cumulative thickness of the banding or lamellae (Bt) exceeds 6 inches.

The C horizon typically is light yellowish brown (10YR 6/4) and pale brown (10YR 6/3) and contains few to common, yellowish brown (10YR 5/6) and light olive brown, (2.5YR 5/6) mottles in the middle or lower layers. The texture of this horizon generally is fine sand, but in some places there are layers of sand. The underlying material is silty clay or clay, which occurs at a depth ranging from about 5 to 35 feet.

Spinks soils are the well drained members of a drainage sequence that commonly includes the moderately well drained Ottokee soils, the somewhat poorly drained Tedrow soils, and the very poorly drained Granby soils. They are adjacent to those soils in many places. Spinks soils are also adjacent to Oakville soils in some areas, but they differ from Oakville soils in having bands in the B horizon above a depth of 72 inches. They differ from Arkport and Galen soils in having less clay in the solum and a higher content of sand.

Tedrow Series

The Tedrow series consists of deep, nearly level, somewhat poorly drained soils on low rises on uplands, mainly in Liberty and Washington Townships. These soils formed in deep, calcareous sands.

In a representative profile of a Tedrow soil that is cultivated, the plow layer is dark grayish brown loamy fine sand about 8 inches thick. The subsoil, between depths of 8 and 33 inches, is yellowish brown, brown, and pale brown loamy fine sand that has common, distinct, yellowish brown light brownish gray and dark brown mottles. The underlying material, between depths of 33 and 60 inches, is mottled, pale olive fine sand.

Tedrow soils have rapid permeability. They are saturated with free water for short periods during winter and spring. These soils have low available moisture capacity and a deep root zone when the water table is low. The root zone is slightly acid to neutral in the upper part.

Representative profile of Tedrow loamy fine sand, 0 to 2 percent slopes, in a cultivated field in Washington Township (W½SE¼NE¼SE¼ sec. 27, T. 6 N., R. 8 E.):

Ap-0 to 8 inches, very dark grayish brown (10YR 3/2, 6/2 dry) loamy fine sand; weak medium granular structure; very friable; many roots; neutral; abrupt smooth boundary.

B21-8 to 16 inches, yellowish brown (10YR 5/4) loamy fine sand; few fine faint dark brown (10YR 4/3) and pale-brown (10YR 6/3) mottles and few medium distinct yellowish-brown (10YR 5/8) mottles; single grain; very friable; common roots; slightly acid; clear wavy boundary.

B22-16 to 31 inches, brown (10YR 5/3) loamy fine sand; many medium distinct yellowish brown (1{)YR 5/6), and strong brown (7.5YR 5/8) mottles and common medium faint light brownish gray (10YR 6/2) mottles; single grain; very friable; few roots; slightly acid; clear wavy boundary.

B3-81 to 33 inches, pale brown (10YR 6/3) fine sand; many coarse distinct light olive brown (2.5Y 5/4), yellowish-brown (10YR 5/4), and grayish brown (10YR 5/2) mottles; single grain; loose; neutral; clear wavy boundary.
C--33 to 60 inches, pale olive (5Y 6/3) fine sand; common medium faint gray (5Y 6/1) and light olive brown (2.5Y 5/4) mottles and many medium faint olive (5Y 5/3) mottles; single grain; loose; moderately alkaline and calcareous.

The thickness of the solum ranges from about 24 to 50 inches but commonly is 30 to 40 inches. The depth to carbonates commonly is the same as the thickness of the solum.

The Ap horizon ranges from, 7 to 10 inches in thickness. It normally is very dark grayish brown (10YR 3/2) or dark brown (10YR 4/3).

The B horizon commonly is yellowish brown (10YR 5/4), brown (10YR 5/3), or pale brown (10YR 6/3) and contains faint to distinct mottles of grayish brown (10YR 5/2), light brownish gray (10YR 6/2), light olive brown (2.5Y 5/4), pale brown (10YR 6/3), yellowish brown (10YR 5/4 and 5/6), and strong brown (7.5YR 5/8).

The C horizon commonly is pale olive (5Y 6/3) or light brownish gray (10YR 6/2) and contains gray (5Y 6/1), light olive brown (2.5Y 5/4), and olive (5Y 5/3) mottles. The texture of this horizon typically is fine sand. Silty clay or clay underlies the Tedrow soils at depths ranging from about 4 to 20 feet.

Tedrow soils are the somewhat poorly drained members of a drainage sequence that includes the moderately well drained Ottokee soils, the well drained Oakville soils, and the very poorly drained Granby soils. They are adjacent to those soils in many places. Tedrow soils differ from the somewhat poorly drained Rimer soils because they lack a fine-textured lower part of the B horizon and C horizon.

Tedrow Series, Silty Subsoil Variant

Soils of the Tedrow series, silty subsoil variant, are similar to typical Tedrow soils in most respects, except that within 40 inches of the surface they have a silty subsoil layer instead of a sandy layer.

In a representative profile of a Tedrow, silty subsoil variant, soil that is cultivated, the plow layer is dark grayish-brown loamy fine sand about 9 inches thick. The subsoil, between depths of 9 to 35 inches, is pale brown and light brownish gray loamy fine sand that is distinctly mottled with yellowish brown and light brownish gray. The underlying material, between depths of 35 to 60 inches, consists of strata of mottled, grayish brown silt and fine sand.

Tedrow, silty subsoil variant, soils have rapid permeability in the sandy upper layers and moderately slow permeability in the lower layers. They are seasonally saturated with water for considerable periods. Although typical Tedrow soils commonly have a low available water capacity, soils of this variant have a medium available water capacity because of their silty layers. Their root zone is deep when the water table is low. Their reaction in the upper 24 inches is slightly acid to neutral.

Representative profile of Tedrow loamy fine sand, silty subsoil variant, 0 to 2 percent slopes, in a cultivated field in Liberty Township (NW¼NE¼NW¼ sec. 33, T. 6 N., R. 7 E.):

Ap-0 to 9 inches, dark grayish brown (10YR 4/2, 6/2 dry) loamy fine sand; weak fine granular structure; very friable; neutral; abrupt smooth boundary.
B21-9 to 31 inches, pale brown (10YR 6/3) loamy fine sand; common medium distinct yellowish brown (10YR 5/6) and light brownish gray (10YR 6/2) mottles; very weak medium subangular blocky structure; very friable; slightly acid; clear smooth boundary.
B22-31 to 35 inches, light brownish gray (10YR 6/2) loamy fine sand; common medium distinct yellowish brown (10YR 5/4) mottles; single grain; loose; neutral; clear smooth boundary.
IIC-35 to 50 inches, grayish brown (2.5Y 5/2) stratified silt and fine sand; many medium distinct light-gray (10YR 6/1) and yellowish brown (10YR 5/4) mottles; moderate medium platy structure; friable; moderately alkaline and calcareous.

The thickness of the solum, and commonly the depth to carbonates, ranges from 22 to 44 inches.

The Ap horizon ranges from 7 to 10 inches in thickness. It normally is very dark grayish brown (10YR 3/2) or dark brown (10YR 4/3).

The B horizon commonly is yellowish brown (10YR 5/4) brown (10YR 5/3), or pale brown (10YR 6/3) and contains faint to distinct mottles of grayish brown (10YR 5/2), light brownish gray (10YR 6/2), light olive brown (2.5Y 5/4), pale brown (10YR 6/3), yellowish brown (10YR 5/4 and 5/6), and strong brown (7.5YR 5/8).

The C horizon is variable in texture but includes layers of silt, silt loam, and fine sand. The layers of silt or silt loam are within a depth of 40 inches.

These soils are typically adjacent to the loamy, somewhat poorly drained Kibbie soils. They are also commonly adjacent to the wetter, dark-colored Colwood soils. These Tedrow soils have a higher content of sand throughout than the Kibbie or Colwood soils.

Toledo Series

The Toledo series consists of dark-colored, very poorly drained soils in broad upland areas on the lake plain both north and south of the Maumee River. These nearly level soils formed in lacustrine silty clay sediment.

In a representative profile, the surface layer is very dark grayish brown silty clay loam about 7 inches thick. The upper 6 inches of the subsoil is gray silty clay. Between depths of 13 and 47 inches, the subsoil is gray silty clay that is distinctly mottled with dark yellowish brown. The underlying material, between depths of 47 and 78 inches, is dark yellowish brown and dark grayish brown calcareous silty clay, silty clay loam, and clay.

Toledo soils have slow permeability. They are saturated with free water for long periods during winter and spring, and they dry out slowly in spring unless they have been artificially drained. These soils have a medium available moisture capacity and a rooting zone that is deep when the water table is low. The root zone is mostly neutral in reaction.

Representative profile of Toledo silty clay loam, in a cultivated field in Liberty Township (SE¼SE¼NE¼NW¼ sec. 7, T. 5 N., R. 7 E.; laboratory data HN-82):

A1-0 to 7 inches, very dark grayish brown (10YR 3/2) silty clay loam, very dark grayish brown (10YR 3/2) crushed; weak fine subangular blocky structure parting to moderate medium granular structure; friable; many roots; neutral; abrupt smooth boundary.

B21g-7 to 13 inches, gray (5Y 5/1) silty clay, dark brown (10YR 4/3) crushed; common fine distinct yellowish-brown (10YR 5/4) and dark yellowish brown (10YR 4/4) mottles; moderate fine angular blocky structure; firm; common roots; thin patchy dark gray (10YR 4/1) clay films mottled with dark brown (7.5YR 5/4) around the peds; neutral; clear smooth boundary.

B22g-13 to 29 inches, gray (5Y 5/1) silty clay, dark yellowish brown (10YR 4/4) crushed; common fine distinct yellowish brown (10YR 5/4 and 5/6) mottles; moderate medium prismatic structure parting to moderate medium angular blocky structure; firm; common roots; moderate continuous dark gray (10YR 4/1) clay films mottled with dark yellowish brown (10YR 4/4) around the peds; neutral; gradual wavy boundary.

B23g-29 to 47 inches, gray (5Y 5/1) silty clay; dark brown (10YR 4/3) crushed; many fine and medium distinct yellowish brown (10YR 5/4 and 5/6) mottles; moderate medium prismatic structure parting to moderate medium subangular and angular blocky structure; very firm; few roots; moderate continuous, grayish brown (2.5Y 5/2) clay films that have few fine and medium distinct strong brown (7.5YR 5/6) mottles around the peds; mildly alkaline; clear wavy boundary.

C1-47 to 70 inches, dark yellowish brown (10YR 4/4), stratified silty clay and silty clay loam; massive; firm; mildly alkaline and calcareous.

C2-70 to 78 inches, dark grayish brown (10YR 4/2) clay; massive; very firm; mildly alkaline and calcareous.

The thickness of the solum, and commonly the depth to carbonates, ranges from about 30 to 55 inches. In some places the lower few inches of the solum are weakly calcareous.

The dark-colored A horizon commonly is 8 inches thick but ranges from 7 to 10 inches in thickness. It generally is very dark grayish brown (10YR 3/2) but ranges to very dark gray (10YR 3/1) or very dark brown (10YR 2/2) in some places. The texture of the A horizon is silty clay loam or silty clay.

The B horizon generally is grayish brown (10YR or 2.5Y 5/2), olive brown (2.5Y 4/4), olive gray (5Y 5/2), dark gray (5Y 4/1), or gray (5Y 5/1) and contains distinct, dark yellowish brown (10YR 4/4), yellowish brown (10YR 5/4 or 5/6), olive brown (2.5Y 4/4), light olive brown (2.5Y 5/4), and reddish-brown (5YR 4/4) mottles. The texture of the B horizon is silty clay that is less than about 12 percent sand.

The C horizon is dark yellowish brown (10YR 4/4), dark brown (10YR 4/3), or yellowish brown (10YR 5/4) and contains few to common, grayish brown (10YR 5/2), olive brown (2.5Y 4/4), greenish-gray (5GY 6/1), light greenish gray (5GY 7/1), and gray (N 5/0) or dark gray (N 4/0) mottles. The horizon is dominantly silty clay but in places has thin lenses of silty clay loam, silt loam, silt, or fine sand. These lenses typically range from 1 millimeter to 1 inch in thickness, though in some places they are thicker. Clay loam glacial till commonly is at a depth of 5 to 12 feet.

Toledo soils are the very poorly drained members of a drainage sequence that includes the somewhat poorly drained Fulton soils and the moderately well drained Lucas soils. They are adjacent to those soils in many places. Toledo soils differ from very poorly drained Lenawee soils in having a higher content of clay throughout. They have a darker colored A horizon than the Latty or Paulding soils, and they have less clay in the B horizon than Paulding soils. Toledo soils have a lower content of sand and coarse fragments than the Hoytville soils.

Tuscola Series

The Tuscola series consists of deep, gently sloping to sloping, moderately well drained soils on breaks along streams that dissect the lake plain, mainly in Liberty Township. These soils formed in loamy material that is high in content of silt and fine sand and is underlain by stratified silt and fine sand.

In a representative profile of a Tuscola soil that is cultivated, the plow layer is dark brown loam about 7 inches thick. The upper part of the subsoil is yellowish brown silt loam that is 4 inches thick. Between depths of 11 and 27 inches, the subsoil is mottled, yellowish brown silt loam. The mottles are yellowish red in the upper part and brownish yellow and strong brown in the lower part. The subsoil has a slightly higher content of clay than the plow layer. The underlying material, between depths of 27 and 68 inches, consists of stratified, calcareous silt and fine seams of sand.

Tuscola soils have moderate permeability. They are saturated with free water for short periods in winter and spring. They have a high available moisture capacity and a deep root zone. The root zone is mostly medium acid to neutral.

Representative profile of Tuscola loam, 6 to 12 percent slopes, moderately eroded, in a cultivated field in Liberty Township (NW¼SE¼SE¼NE¼ sec. 32, T. 6 N., R.7E.):

Ap 0 to 7 inches dark brown (10YR 4/3) loam; weak medium subangular blocky structure parting to moderate fine granular structure; friable; few roots; medium acid; abrupt smooth boundary.

B1-7 to 11 inches yellowish brown (10YR 5/4) silt loam; weak medium subangular blocky structure; friable; few roots; few strong brown (7.5YR 5/8) nodules of iron oxide; thin very patchy dark yellowish brown (10YR 4/4) clay films on peds; slightly acid; clear wavy boundary.

B2t-11 to 19 inches, yellowish brown (10YR 5/4) silt loam; few fine distinct yellowish red (5YR 4/8 or 5/8) mottles; moderate medium angular blocky structure parting to moderate fine angular blocky structure; very friable; few roots; thin patchy dark yellowish brown (10YR 4/4) clay films on peds; few dark brown (7.5YR 3/2) iron-manganese stains; slightly acid; clear smooth boundary.

B3t-19 to 27 inches, yellowish brown (10YR 5/4) silt loam; few fine faint brownish yellow (10YR 6/8) and strong-brown (7.5YR 5/6) mottles: weak medium platy structure parting to moderate very fine subangular blocky structure; friable; few roots; thin patchy dark yellowish brown (10YR 4/4) clay films on peds; few dark brown (7.5YR 3/2) iron-manganese stains; neutral; abrupt smooth boundary.

C-27 to 68 inches, stratified, yellowish brown (10YR 5/4) silt loam and light olive brown (2.5Y 5/6) fine seams of sand; moderate fine platy structure; firm; few roots; the upper 8 inches has thin very patchy dark yellowish brown (10YR 4/4) clay films on vertical faces of peds and weak coarse angular blocky structure; few light gray (10YR 7/2) lime concretions; light olive brown (2.5Y 5/4) and olive yellow (2.5Y 6/6) silt or fine sand coatings on platy faces; mildly alkaline, slight effervescence.

The solum ranges from 27 to 42 inches in thickness. The depth to carbonates commonly is the same as the thickness of the solum, though in some places the upper several inches of the C horizon is mildly alkaline.

The Ap horizon ranges to as much as 12 inches in thickness. This horizon commonly is dark brown (10YR 4/3) and dark grayish brown (10YR 4/2). The profile in uneroded areas has an A2 horizon.

The B horizon is yellowish brown (10YR 5/4), dark yellowish brown (10YR 4/4), and brown (10YR 5/3) and contains few distinct yellowish red (5YR 4/6), brownish yellow (10YR 6/6), and strong brown (7.5YR 5/6) mottles. In many places the lowermost few inches of the solum is mottled with light brownish gray (10YR 6/2) or grayish brown (10YR 5/2). Texture of the B horizon commonly is silt loam or loam, but there are layers of light silty clay loam and light clay loam in some places.

The C horizon generally is yellowish brown (10YR 5/4) or grayish brown (10YR 5/2), but it ranges to light brownish gray (10YR 6/2). It is typically stratified with layers of light olive brown (2.5Y 5/6) fine sand, very fine sand, silt, and silt loam. Thickness of these layers ranges from 1fs inch to several inches.

Tuscola soils are the moderately well drained members of a drainage sequence that includes the somewhat poorly drained Kibbie soils and the very poorly drained Colwood soils. They are commonly adjacent to the wetter Kibbie soils. They are less commonly adjacent to the dark colored Colwood soils. In some places the Tuscola soils are adjacent to the moderately well drained Lucas soils. They differ from Lucas soils in having a less clayey solum. They are less clayey throughout than Shinrock soils, and they have a higher content of silt than Rawson or Haney soils. Unlike the Rawson soils, Tuscola soils lack a contrasting finer textured horizon within 40 inches of the surface.

Vaughnsville Series

The Vaughnsville series consists of deep, nearly level, moderately well drained to somewhat poorly drained soils in elongated strips on the inner, or lake, slope of beach ridges. They extend from the base of the ridge upward to about one-third the distance to the crest. These soils formed in loamy material underlain by calcareous lacustrine clay or clay glacial till. When plowed, Vaughnsville soils are obvious on the landscape because they have a distinctive reddish color.

In a representative profile of a Vaughnsville soil that is cultivated, the plow layer is dark reddish-brown loam about 7 inches thick. The upper 2 inches of the subsoil is also dark reddish brown. The subsoil, between depths of 9 and 30 inches, is dark reddish brown and grayish brown clay loam in the upper 13 inches and mottled, yellowish brown sandy loam in the lower 8 inches. The underlying material, between depths of 30 and 60 inches, consists of calcareous clay loam and clay.

Vaughnsville soils have moderate permeability in the finer textured underlying material. This results in seasonal saturation. Wet spots, caused by seepage from adjacent areas, occur in these soils. The soils have a medium available moisture capacity and a moderately deep root zone when the water table is low. The root zone is neutral to slightly acid in the upper part.

Representative profile of Vaughnsville loam, 0 to 2 percent slopes, in a cultivated field in Pleasant Township (NE¼NE¼NE¼NE¼ sec. 18, T. 3 N., R. 6 E.):

Ap-0 to 7 inches, dark reddish brown (5YR 3/2, 3/3 rubbed) loam; moderate medium granular structure; slightly hard ; common roots; 3 percent coarse fragments; neutral; abrupt smooth boundary.

B1t-7 to 9 inches, dark reddish brown (5YR 3/2) loam; moderate thick platy structure; slightly hard; common roots; thin continuous clay bridging of sand grains on faces of peds; 4 percent coarse fragments; neutral; clear smooth boundary.

B21t-9 to 17 inches, dark reddish brown (2.5YR 3/4) sandy clay loam; moderate medium subangular blocky structure; hard; few roots; thin continuous clay bridging of sand grains on faces of peds; 15 percent coarse fragments; neutral; clear, wavy boundary.

B22t-17 to 22 inches, grayish brown (2.5YR 5/2) light sandy clay loam; few fine distinct, yellowish brown (10YR 6/6) mottles and many medium faint light olive brown (2.5Y 5/4) mottles; weak medium subangular blocky structure; friable; few roots; thin patchy clay bridging of sand grains on faces of peds; common black (5Y 2/1) iron-manganese concretions; neutral; clear smooth boundary.

B3-22 to 30 inches, yellowish brown (10YR 5/4) sandy loam; few, coarse, faint, yellowish brown (10YR 5/8) mottles; very weak, medium, subangular blocky structure parting to massive; loose; few roots; 25 percent coarse fragments; mildly alkaline; weakly calcareous ; abrupt, smooth boundary.

IIC1g-80 to 32 inches, olive gray (5Y 5/2) clay loam; few, fine, distinct, yellowish brown (10YR 5/6) mottles and many, coarse, faint, grayish brown (2.5Y 5/2) mottles; massive; friable; coatings on vertical cleavages; moderately alkaline, calcareous; clear, smooth boundary.

IIIC2g-82 to 60 inches, olive gray (5Y 5/2) clay; many coarse distinct dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/8) mottles; massive; firm; coatings on vertical faces of cleavages; moderately alkaline; calcareous.

The thickness of the solum, and commonly the depth to carbonates, ranges from 25 to 38 inches, but mainly it is about 26 to 32 inches. In some places the lower few inches of the solum is weakly calcareous.

The dark-colored Ap horizon commonly is 6 to 9 inches thick. It generally is dark brown (7.5YR 3/2), dark reddish brown (5YR 3/2,2/3, or 2.5YR 3/4), or reddish brown (5YR 4/3). In some areas there is an A2 horizon that is loam or sandy loam in texture and reddish in color.

The B horizon generally is dark reddish brown to dark brown in a hue that ranges from 2.5YR to 7.5YR, a value of 3 to 6, and a chroma of 3 or 4 in the upper part. It is dark brown (7.5YR 4/4), brown (10YR 4/3), yellowish brown (10YR 5/4), or grayish brown (2.5Y 5/2) in the lower part. Mottling in the middle and lower parts of the B horizon is faint to distinct, light olive brown (2.5 Y 5/4), dark, yellowish brown (10YR 4/4), yellowish brown (10YR 5/4), or grayish brown (10YR 5/2). Textures generally are sandy clay loam, loam, and sandy loam, but in some places coarser textured layers occur. The average clay content of the horizon is more than 18 percent.

The C horizon commonly is olive gray (5YR 5/2), light olive brown (2.5Y 5/4), or brown (10YR 4/3) and contains distinct. Yellowish brown (10YR 5/6), dark yellowish brown (10YR 4/4), grayish brown (2.5Y 5/2), or gray (10YR 5/1) mottles. The IIC horizon typically is lacustrine silty clay or clay loam, and it ranges from 4 inches to about 2 feet in thickness. The IIIC horizon typically is clay or clay loam glacial till.

Vaughnsville soils are adjacent to the well-drained Oshtemo soils in many places. They commonly are adjacent to the moderately well drained Rawson and Haney soils and the somewhat poorly drained Digby and Haskins soils. Vaughnsville soils differ from all those soils, including the Oshtemo, in having redder hues in the A horizon and upper part of the B horizon. This reddish color is caused by the precipitation of iron-oxide compounds from seepage water.

The Vaughnsville soils in this county have a darker A horizon and a thinner solum than the range defined for the series. These differences, however, do not significantly affect the usefulness or behavior of these soils.

Wabasha Series

The Wabasha series consists of deep, dark-colored soils that are very poorly drained. These soils formed in clayey alluvium on flood plains along streams in the northern part of the county, mainly in Ridgeville, Liberty, and Washington Townships. They are nearly level and are flooded during periods of high water, mainly in winter, though flooding can occur during any period of the year.

In a representative profile of a Wabasha soil that is cultivated, the plow layer is very dark gray silty clay about 7 inches thick. The subsoil, between depths of 7 and 48 inches, is dark-gray and gray silty clay mottled with dark brown or light olive brown in the upper part and with dark yellowish brown and yellowish-brown in the lower part. The underlying material, between depths of 48 and 70 inches, is calcareous, yellowish-brown clay that has some thin seams of sand.

Wabasha soils have slow permeability. They are seasonally saturated with free water for a significant period, and they are slow to dry out in spring unless they have been artificially drained. These soils have a medium to high available moisture capacity. The root zone is deep in summer when the water table IS low or m areas that are artificially drained. Reaction in the root zone is mostly mildly alkaline.

Representative profile of Wabasha silty clay, in a cultivated field in Liberty Township (W½NW¼NW¼NE¼ sec. 22, T. 6 N., R. 7 E.) :

Ap-0 to 7 inches, very dark gray (10YR 3/1) silty clay; moderate medium granular structure; friable; common roots; mildly alkaline; abrupt smooth boundary.

B1g-7 to 16 inches, dark gray (2.5Y 4/1) silty clay; few fine prominent dark brown (7.5YR 4/4) mottles; weak coarse prismatic structure parting to moderate medium angular blocky structure; firm; common roots; mildly alkaline; clear smooth boundary.

B21g-16 to 22 inches, gray (N 5/0) silty clay; common fine faint olive gray (5Y 5/2) mottles and prominent dark brown (7.5YR 4/4) mottles; moderate coarse prismatic structure parting to moderate medium and coarse angular blocky structure; firm; common roots; dark gray (10YR 4/1) coatings on faces of peds that have a few fine distinct brown (7.5YR 4/4) mottles; mildly alkaline; clear smooth boundary.

B22g-22 to 29 inches, gray (5Y 5/1) silty clay; common fine faint grayish brown (2.5Y 5/2) mottles, distinct light olive brown (2.5Y 4/4) mottles, and prominent dark brown (7.5YR 4/4) mottles; moderate coarse prismatic structure parting to moderate medium angular blocky structure; firm; common roots; dark gray (10YR 4/1) coatings on faces of peds that have a few reddish-brown (5YR 4/4) mottles mildly alkaline; gradual smooth boundary.

B23g-29 to 48 inches, gray (5Y 5/1) silty clay; common, medium, distinct, olive (5Y 5/3) mottles and prominent, dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/6) mottles; moderate, coarse, prismatic structure parting to moderate, coarse, angular blocky structure; firm; few fine roots; dark gray (5Y 4/1) coatings on faces of peds that have a few, fine, prominent, dark-brown (7.5YR 4/4) mot- ties; mildly alkaline; weakly calcareous in lower part; gradual, wavy boundary.

C-48 to 70 inches, yellowish brown (10YR 5/4) clay; massive; firm; a few thin strata of sand are present; vertical surfaces of cleavages have gray (5Y 5/1) coatings; moderately alkaline; calcareous.

The thickness of the solum ranges from 40 to 60 inches but most commonly is 42 to 50 inches. The depth to carbonates commonly is the same as the thickness of the solum, but in some places the lower part of the solum is calcareous. The upper part of the solum is neutral to mildly alkaline, and the lower part is mildly alkaline.

The dark colored Ap horizon commonly is 8 inches thick but ranges from 6 to 10 inches in thickness.

The B horizon is gray (N 5/0, 5Y 5/1, or 10YR 5/1) or dark gray (N 4/1 or 10YR 4/1)and is mottled with faint and distinct, olive (5Y 5/3), olive gray (5Y 5/2), grayish brown (2.5Y 5/2), dark brown (7.5YR 4/4), light olive brown (2.5Y 5/4), dark yellowish brown (10YR 4/4), and yellowish brown (10YR 5/4) mottles.

The C horizon commonly is yellowish brown (10YR 5/4), light brownish gray (10YR 6/2), and, in some places, gray (10YR 5/1). The texture in this horizon is silty clay or clay that has thin layers of stratified sand, silt loam, sandy loam, loam, and fine gravel and sand. These layers are calcareous.

The Wabasha soils commonly are adjacent to the very poorly drained Sloan soils, the somewhat poorly drained Shoals soils, and the moderately well drained Medway soils. They are finer textured throughout than those soils. They differ from Toledo soils in having formed in recent alluvium and in being subject to flooding. They have a much higher content of clay throughout than the very poorly drained Cohoctah soils.

Warners Series

The Warners series consists of dark-colored, mucky, very poorly drained soils in low, depressional areas in northeastern Liberty Township and northwestern Washington

Township. These soils formed in mixed mineral and woody and fibrous materials that are underlain by soft marl.

In a representative profile of a Warners soil that is cultivated, the surface layer is black muck about 8 inches thick. The next layer is black sandy clay loam to a depth of 12 inches. The underlying material, between depths of 12 and 31 inches, is soft marl. Below this material is gray fine and very fine sand that extends to a depth of 50 inches or more.

Warners soils have slow permeability in the marly substratum and moderately rapid to rapid permeability in the underlying sandy substratum. They have a high water table for long periods unless they have been artificially drained. They have a medium available moisture capacity and a root zone that typically is shallow. The marl tends to limit root development. The root zone above the marl is neutral in reaction.

Representative profile of Warners muck, in a cultivated field in Liberty Township (NE¼NE¼SE¼SE¼ sec. 24, T. 6 N., R. 7 E.; laboratory data HN-78):

Ap1-0 to 5 inches. black (10YR 2/1) muck; moderate fine granular structure; very friable; many roots; neutral; clear smooth boundary.

Ap2-5 to 8 inches, black (10YR 2/1) muck; weak fine subangular blocky structure parting to moderate medium granular structure; very friable; many roots; neutral; abrupt smooth boundary.

IIA1-8 to 12 inches, black (N 2/0) sandy clay loam; few fine faint olive-brown (2.5Y 4/4) mottles; moderate medium angular blocky structure; friable; many roots; neutral; gradual smooth boundary.

IIIC1-12 to 31 inches, light olive-gray (5Y 6/2) slit loam (soft marl); many medium distinct olive-yellow (2.5Y 6/6) and light olive-brown (2.5Y 5/6) mottles; massive; friable; few roots; moderately alkaline; highly calcareous; abrupt smooth boundary.

IVC2-31 to 50 inches, gray (N 6/0) fine and very fine sand; single grain; loose; moderately alkaline; calcareous.

The depth to marl ranges from 10 to 15 inches. Thickness of the marl ranges from 6 inches to about 2 feet. The depth to carbonates commonly is the same as the depth to the IIIC horizon, but in some places the A horizon is weakly calcareous.

The dark-colored A horizon generally is black (10YR 2/1 or N 2/0) or, in some places, very dark brown (10YR 2/2). The IIA1 horizon is mottled with dark grayish brown (10YR 4/2 to 2.5Y 4/2) and with dark reddish brown (5YR 3/4) in some places. The texture of the IIA1 horizon ranges from sandy clay loam to mucky silty clay loam.

The IIIC horizon ranges from light olive-gray (5Y 6/2) to gray (5Y 6/1) and contains many olive-yellow (2.5Y 6/6) and light olive-brown (2.5Y 5/6) mottles. The texture of the marl is silt loam. Underlying the marl, at depths ranging from about 12 to 36 inches, is gray (N 6/0) fine and very fine sand.

Warners soils commonly are adjacent to the somewhat poorly drained Tedrow soils, the moderately well drained Ottokee soils, and the very poorly drained Granby soils. Warner soils, in addition to having marl at a shallow depth, have a higher content of organic matter than those other soils. Warners soils have a lower content of organic matter than the Adrian soils, which are organic soils overlying sand.

The Warners soils in this county have a higher content of organic matter in the surface layer and a thinner mineral layer above the marl than the Warners soils in other survey areas. These differences,. however, do not greatly affect the use or behavior of these soils.

Wauseon Series

The Wauseon series consists of dark-colored, nearly level, very poorly drained soils in broad areas on uplands, mostly south of the Maumee River. These soils formed in loamy and sandy materials that are underlain by finer textured lacustrine clay or clayey glacial till.

In a representative profile of a Wauseon soil that is cultivated, the plow layer is very dark gray fine sandy loan;. about 10 inches thick. Next is a layer of very dark gray fine sandy loam about 5 inches thick. The subsoil, between depths of 15 inches and about 40 inches, consists of gray fine sand., loam, gray loamy fine sand, and gray fine sand. It is distinctly mottled with yellowish brown, light olive brown, and light brownish gray in the upper part and with yellowish brown and yellowish red in the middle part. The lower part of the subsoil is unmottled. The underlying material, between depths of 40 and 60 inches or more, IS calcareous, dark-gray clay.

Wauseon soils have rapid permeability in the upper part and very slow permeability in the underlying clay material. They are seasonally saturated with free water for significant periods. Where they have been adequately drained, they dry out rather quickly. These soils have a medium available moisture capacity. The root zone is deep if the soil has been drained or in summer when the water table is low. The root zone is slightly acid to neutral in the upper part.

Representative profile of Wauseon fine sandy loam, in a cultivated field in Monroe Township (NW¼SE¼SW¼NE¼ sec. 1, T. 4 N., R. '7 E.) :

Ap-0 to 10 inches, very dark gray (10YR 3/1) fine sandy loam; moderate fine granular structure; soft; many roots; slightly acid; clear smooth boundary.

A1-10 to 15 inches, very dark gray (10YR 3/1) fine sandy loam; few coarse faint black (10YR 2/1) and very dark grayish brown (2.5Y 3/2) mottles; weak medium, subangular blocky structure; slightly hard; many roots; neutral; gradual wavy boundary.

B21g-15 to 27 inches, gray (10YR 5/1) fine sandy loam; common medium distinct light olive brown (2.5Y 5/4), light brownish gray (10YR 6/2), yellowish brown (10YR 5/6), and strong brown (7.5YR 5/6) mottles; weak to moderate medium angular blocky structure; slightly hard; few roots; neutral; clear irregular boundary.

B22g-27 to 36 inches, gray (10YR 5/1) loamy fine sand; common coarse distinct yellowish brown (10YR 5/6), gray (N 6/0), and yellowish red (5YR 4/6) mottles; weak medium angular blocky structure; friable; tongues of material from B21g horizon extend through this horizon; mildly alkaline; abrupt wavy boundary.

B3g-36 to 40 inches, gray (10YR 5/1) fine sand; single grain; loose; mildly alkaline; slightly calcareous; abrupt smooth boundary.

IICg-40 to 60 inches, dark gray (10YR 4/1) clay; massive; very firm; common pebbles and shale fragments; moderately alkaline; calcareous.

The solum ranges from 24 to 40 inches in thickness. The depth to carbonates commonly is the same as the thickness of the solum, but in some places a layer of fine sand that is 3 to 12 Inches thick over the substratum is weakly calcareous. The depth to the fine-textured IIC horizon ranges from 30 to 40 inches.

The dark-colored A horizon is thicker than 10 inches; generally it ranges from 10 to 16 inches in thickness. It is very dark gray (10YR 3/1), very dark brown (10YR 2/2), or black (10YR 2/1).

The B horizon generally is gray (10YR 5/1 or 2.5Y 5/1), Grayish brown (10YR 5/2), dark grayish brown (10YR 4/2), or dark gray (5Y 4/1) and contains distinct mottles of light olive brown (2.5Y 5/4), dark grayish brown (2.5Y 4/2), light brownish-gray (10YR 6/2), yellowish brown (10YR 5/6), dark yellowish brown (10YR 4/4), and strong brown (7.5YR 5/6). Texture of the B horizon generally is fine sandy loam but ranges to fine sand.

The C horizon commonly is gray (10YR 5/1) or dark gray (10YR 4/1), but in some places it is brown (10YR 4/3) or dark yellowish brown (10YR 4/4). It commonly is mottled with gray or yellowish brown, but in some places there are few mottles. The texture of the C horizon is silty clay or clay.

Wauseon soils are the very poorly drained members of a drainage sequence that includes the somewhat poorly drained Rimer soils and the moderately well drained Seward soils. In some places they are adjacent to those soils, but commonly they are adjacent to Mermill soils. They differ from Mermill soils in having less clay in the B horizon. They differ from Gilford soils in having a clayey C horizon within 40 inches of the surface. Wauseon soils have a higher content of silt and clay in the B horizon than Granby soils.

Formation of the Soils

This section relates the factors of soil formation to the soils in Henry County and explains the processes of soil formation.

Factors of Soil Formation

A soil is a three-dimensional natural body consisting of mineral and organic material that can support plant growth. The nature of any soil at a given site is the result of the interaction of five general factors—parent material, climate, plants and animals, relief, and time. Climate and plants and animals have an effect on parent material that is modified by relief over time. Theoretically, if all these factors were identical at different sites, the soils at these sites would be identical. Differences among the soils are caused by variations in one or more of these factors.

Parent Material

Henry County is in the center of the glacial lake plain of northwestern Ohio. The parent materials in which the soils formed are (1) glacial till; (2) clayey lacustrine material; (3) glacial lake beach deposits; (4) stream terrace material from glacial outwash; (5) deltaic sediments in the post glacial lake; and (6) recent alluvium. These materials have greatly affected the textures of the various soils in the county.

About 62 percent of the county (soil associations 1 and 2) consists of fine-textured glacial till. The clay content in the upper 1 to 2 feet of the till ranges from about 38 percent to 50 percent. Clay content deeper in the till drops to about 31 percent in some places. This till plain is generally more nearly level than glacial till plains elsewhere in Ohio. This, plus the indicated clay content of the till, leads to the theory that the glacial till in this area has been beveled or reworked by glacial lake action. The dominant soils that formed in this glacial till material are the Hoytville and Nappanee. In the soils of both series, the clayey B horizon has glacial till pebbles and a sand content that are characteristic of glacial till elsewhere.

The Fulton, Latty, Lenawee, Paulding, Toledo, and similar soils formed in clayey lacustrine material. These soils show some evidence of stratification, and they lack the sand content and pebbles that are characteristic of soils formed in glacial till. The Paulding soils have the highest clay content of this group of soils, but they all are clayey enough that they tend to crack badly in summer during dry periods. Clay contents range from 40 to 50 percent in Toledo soils and from 60 to 70 percent or more in Paulding soils.

The Latty soils are transitional in clay content to both Hoytville and Paulding soils. Stratification is evident in Latty soils, and Paulding soils have a higher content of sand than is typical.

The fluctuating waters of the postglacial lakes caused the formation of sandy and gravelly beach ridges and fairly extensive areas of both sandy and silty depositions. The beach ridges consist dominantly of deep sandy to loamy deposits that have some gravel. Haney, Millgrove, Oakville, Oshtemo, and Spinks soils are sandy or sandy and gravelly soils that formed on these beach ridges. Digby, Haney, and Oshtemo soils also formed In outwash material of similar texture on terraces. The poorly drained Millgrove soils occur both on the ridges and elsewhere in similar material on the lake plain. Haskins, Mermill, and Rawson soils are examples of soils that formed in moderately thick deposits of loamy material. Rimer, Seward, and Wauseon soils formed in sandy materials overlying the clayey lacustrine sediment or glacial till. Part of the profile of all three of these soils was formed in the upper material and part in the lower material. The soils have slow or very slow permeability because of the clayey underlying material.

Northwest of Liberty Center is a fairly large area of soils that formed in silty and fine sandy deltaic materials. Colwood, Kibbie, and Tuscola soils are the dominant soils that formed in this material.

Genesee, Ross, Shoals, and Sloan soils are examples of soils that formed in recent alluvium in the county. They generally reflect the silt, sand, or clay content of the soils on uplands in their respective drainage areas.

Climate

Climate has been mainly responsible for determining the character of the vegetation, because the climate has been relatively uniform for a long enough period so that hardwood trees are the climax vegetation. The climate for a long period has been such that percolating water has leached bases and carbonates from most of the soils to the extent that many of the soils are acid to a moderate depth. Differences in the reaction in the upper 2 feet of most of the soils can be attributed to differences in the content of carbonates in the parent material. The frequency of rainfall has allowed wetting and drying cycles that were favorable to the downward movement of clay minerals. For example, the Del Rey, Lucas, and Rawson soils have horizons of clay accumulation in their subsoil. Freezing and thawing have aided in the development of soil structure in many of the clayey soils in the county. Warm temperatures in summer have favored biological and chemical reactions in the soil.

The climate is relatively uniform throughout the county and has been for a long time. There are, however, areas of contrasting microclimate caused by minor differences in relief, but these differences are small in this county.

Living Organisms

The vegetation under which a soil forms influences soil properties, such as color, structure, reaction, and content and distribution of organic matter. Vegetation extracts water from the soil, recycles nutrients, and adds organic matter to the soil. Gases derived from root respiration combine with water to form acids that influence the weathering of minerals. Because of a lower content of organic matter, soils that formed under forest vegetation are generally lighter colored than those that formed under grasses.

The native vegetation of the county can be placed in four groups: (1) Swamp forest covered the flat uplands of the county. Hoytville, Millgrove, Mermill, Latty, and Paulding soils formed under this vegetation. (2) Oak trees were dominant on the better drained soils in the sandy beach-ridge and outwash areas. Oakville, Ottokee, and Oshtemo soils formed under this vegetation. These and other upland soils under oaks are light colored and are slightly to moderately acid. Lower amounts of organic matter are in soils that formed under trees than in those that formed under grass. (3) Water-tolerant grasses, reeds, sedges, and shrubs were in small to moderate-sized, level or depressional areas which were swampy much of the time. The organic matter buildup from the vegetation in these swamp areas provided the parent material in which the Adrian muck and Warners muck soils developed. (4) Scattered throughout the swamps and oak forests were occasional grassy openings in which grasses grew. In these areas large amounts of organic matter were added to the soil and the surface layer became darker than is typical. Soils having this darker surface layer likely formed in the grassy openings.

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

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

Human activities have significantly influenced soil formation. Native forests have been cleared and developed for farming and other uses. Cultivation has accelerated erosion on sloping soils, wet soils have been drained, and manure, lime, chemical fertilizer, and pesticides have been applied in cultivated areas. Cultivation has affected soil structure and compaction and lowered the content of organic matter. The development of land for urban uses or for mining has significantly influenced the soils in some areas.

Relief

Differences in elevation or relief are small throughout Henry County, but they are sufficient to create zones of microclimate that are important. For example, nearly all of the very poorly drained soils, such as Colwood, Hoytville, Millgrove, Paulding, and Toledo, are nearly level or depressional. These soils have a seasonally high water table, slow surface runoff, and in some cases, tend to accumulate runoff water from nearby soils. These are among the wettest soils in the county. The well drained and moderately well drained soils, such as Lucas, St. Clair, and Tuscola, have short slopes where surface runoff is rapid and there is little or no chance for excess water to accumulate. The major differences in the soils, as a result of these microclimates, are characterized by differences in soil colors. The very poorly drained soils are dominantly gray, and the better drained soils are mostly brown or yellowish brown. The gray reflects reducing conditions within the soil, and the brighter colors reflect an oxidizing soil climate. Gray mottles and coatings in the moderately well drained and somewhat poorly drained soils, such as Haskins and Rawson soils, indicate the presence and relative height of a seasonal high water table.

The four general relief positions in the county are beach ridges, uplands, stream terraces, and flood plains. In the first three positions, relief variations affect drain- age, runoff, and erosion. On the flood plains, relief mainly affects drainage and susceptibility to flooding.

Steep soils on uplands generally are thinner than the same soils in more nearly level areas. For example, St. Clair soils that have slopes of 25 to 45 percent have thinner layers or horizons than St. Clair soils that have slopes of 6 to 12 percent. Many eroded areas of steep St. Clair and Lucas soils have had much of the solum removed by erosion.

Relief is an important factor in the development of a drainage sequence of soils. A drainage sequence includes two or more soils having different natural drainage that formed in the same kind of parent material. Fulton, Lucas, and Toledo soils make up such a sequence. The moderately well drained Lucas soils have slopes ranging from 2 to 45 percent. The somewhat poorly drained Fulton soils have slopes ranging from 0 to 6 percent. The very poorly drained Toledo soils have slopes that are less than 2 percent.

Time

All soils require time for the development of distinct horizons and other characteristics. The length of time a parent material has been in place and exposed to the active forces of vegetation and climate is an important factor in soil formation. The influence of time, however, is greatly modified by other soil-forming factors, namely relief and parent material.

The glacial till that now forms the land surface of approximately 60 percent of Henry County has been exposed to the other soil-forming factors since the retreat of the last glacier approximately 13,000 years ago, or since the recession of the various glacial lake levels 9,000 to 12,000 years ago. The sandy and gravelly beach-ridge deposits and finer textured lacustrine deposits also occurred during the same period. Essentially, most of the parent materials of the soils, excepting the recent alluvium, have had an equal period of time for soil formation. The obvious differences among the soils, therefore, resulted from differences in rates of soil formation caused by differences of parent material, topography, or other soil-forming factors. On the flood plains, soils such as Shoals, Sloan, and Genesee are periodically flooded and the deposition of new sediments prevents the development of distinct profiles. Profile development is also slight in the Oakville, Ottokee, and other sandy soils. The quartz sands are very resistant to physical and chemical change.

From the standpoint of geological age, the soils of Henry County have been developing for a relatively short time. This accounts for the shallowness of leaching and a slightly acid to neutral reaction common in many of the soils.

Processes of Soil Formation

Soil forms through complex processes that are grouped into four general categories. These are additions, removals, transfers, and transformations. These processes affect soil formation, although in differing degrees.

The accumulation of organic matter in the A horizon of the mineral soils in Henry County is an example of an addition. This accumulation is the main reason for the dark color of the A horizon. The color of the raw parent material is uniform with increasing depth.

The leaching of lime from the upper 1 to 4 feet in many of the soils in Henry County that formed in till is an example of a removal. The parent material of these soils was initially limy, but the lime has been leached from the upper part of the profile by percolating water.

The translocation of clay from the A horizon to the B horizon in many soils on uplands in the county is an example of a transfer. The A horizon or an E horizon is a zone of eluviation, or loss. The B horizon is a zone of illuviation, or gain. In Hoytville and Nappanee soils, and other soils, the B horizon has more clay than the parent material and the A horizon has less clay. In the B horizon of some soils, thin clay films are in pores and on faces of peds. This clay has been transferred from the A horizon.

An example of a transformation is the reduction and solubilization of ferrous iron. This process takes place under wet, saturated conditions in which there is no molecular oxygen. Gleying, or the reduction of iron, is evident in Latty, Paulding, and Hoytville soils, which have a dominantly gray subsoil. The gray color indicates the presence of reduced ferrous iron, which, in turn, implies wetness. Reduced iron is soluble, but it commonly has been moved short distances in the soils in Henry County, stopping either in the horizon where it originated or in an underlying horizon. Part of this iron can be reoxidized and segregated in the form of stains, concretions, or bright yellow and red mottles.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

Ablation till. Loose, permeable till deposited during the final downwasting of glacial ice. Lenses of crudely sorted sand and gravel are common.

AC soil. A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvial fan. The fanlike deposit of a stream where it issues from a gorge upon a plain or of a tributary stream near or at its junction with its main stream.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Alpha, alpha-dipyridyl. A dye that when dissolved in 1N ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Aspect. The direction in which a slope faces.

Association, soil. A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available water capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Backslope. The position that forms the steepest and generally linear, middle portion of a hillslope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.

Backswamp. A floodplain landform. Extensive, marshy or swampy, depressed areas of flood plains between natural levees and valley sides or terraces.

Basal area. The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.

Basal till. Compact till deposited beneath the ice.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Base slope. A geomorphic component of hills consisting of the concave to linear (perpendicular to the contour) slope that, regardless of the lateral shape, forms an apron or wedge at the bottom of a hillside dominated by colluvium and slope-wash sediments (for example, slope alluvium).

Beach ridge. A low, essentially continuous mound of beach or beach and dune material heaped up by the action of waves and currents on the backshore of a beach, beyond the present limit of storm waves, and occurring singly or as one of a series of approximately parallel deposits. These ridges define the limits of relict lakes.

Bedding planes. Fine strata, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediment.

Bedding system. A drainage system made by plowing, grading, or otherwise shaping the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bedrock-controlled topography. A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.

Beta horizon. A special type of lower Bt horizon with a significant accumulation of translocated silicate clay between two contrasting parent materials.

Borrow pit. An open excavation from which soil and underlying material have been removed, usually for construction purposes. Typically less than 2 acres in size. Larger areas are mapped as Udorthents.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Breaks. The steep and very steep broken land at the border of an upland summit that is dissected by ravines.

Breast height. An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.

Brush management. Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

Bulk density. The mass of a dry soil per unit bulk volume. The bulk volume is determined before drying to a constant weight at 105 degrees C. The value is expressed in grams per cubic centimeter.

Cable yarding. A method of moving felled trees to a nearby central area for transport to a processing facility. Most cable yarding systems involve use of a drum, a pole, and wire cables in an arrangement similar to that of a rod and reel used for fishing. To reduce friction and soil disturbance, felled trees generally are reeled in while one end is lifted or the entire log is suspended.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

California bearing ratio (CBR). The load-supporting capacity of a soil as compared to that of standard crushed limestone, expressed as a ratio. First standardized in California. A soil having a CBR of 16 supports 16 percent of the load that would be supported by standard crushed limestone, per unit area, with the same degree of distortion.

Canopy. The leafy crown of trees or shrubs. (See Crown.)

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Cement rock. Shaly limestone used in the manufacture of cement.

Channery soil material. Soil material that has, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Chemical treatment. Control of unwanted vegetation through the use of chemicals.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay depletions. Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Clayey. Containing more than 35 percent clay.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Climax plant community. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Closed depression. A shallow, saucer-shaped area that is slightly lower on the landscape than the surrounding area and is without a natural outlet for surface drainage.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material. Material that has 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

COLE (coefficient of linear extensibility). See Linear extensibility.

Colluvium. Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Compaction. Any process by which the mineral grains of soil are rearranged to decrease void space and bring them into closer contact with one another, thereby increasing the weight of solid material per cubic foot. In agronomy, usually associated with machinery traffic across the soil during farming operations.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Conglomerate. A coarse grained, clastic rock composed of rounded or subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer textured material. Conglomerate is the consolidated equivalent of gravel.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

Contour. An imaginary line on the surface of the earth connecting points of the same elevation.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Coprogenous earth (sedimentary peat). Fecal material deposited in water by aquatic organisms.

Corrosion. Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cropland. Land used primarily for the production of adapted cultivated, close-growing crops, fruit, or nut crops for harvest, alone or in association with sod crops.

Cropping system. Growing crops according to a planned system of rotation and management practices.

Cross-slope farming. Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.

Crown. The upper part of a tree or shrub, including the living branches and their foliage.

Culmination of the mean annual increment (CMAI). The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Delta. A body of alluvium having a surface that is nearly flat and fan shaped; deposited at or near the mouth of a river or stream where it enters a body of relatively quiet water, generally a sea or lake.

Dense material. A very firm, massive, noncemented, root-restrictive layer (commonly till) that has no cracks or in which the spacing of cracks that roots can enter is 10 centimeters or more. The materials within the survey area have a bulk density of more than 1.8 grams per cubic centimeter.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Depth to bedrock (in tables). Bedrock is too near the surface for the specified use.

Depth to dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Dip slope. A slope of the land surface, roughly determined by and approximately conforming to the dip of the underlying bedrock.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Divided-slope farming. A form of field stripcropping in which crops are grown in a systematic arrangement of two strips, or bands, across the slope to reduce the hazard of water erosion. One strip is in a close-growing crop that provides protection from erosion, and the other strip is in a crop that provides less protection from erosion. This practice is used where slopes are not long enough to permit a full stripcropping pattern to be used.

Dolostone. A term used for the sedimentary rock dolomite in order to avoid confusion with the mineral of the same name. A carbonate sedimentary rock consisting mostly (more than 50 percent by weight) of the mineral dolomite [$CaMg(CO_3)_2$].

Drainage, surface. Runoff, or surface flow of water, from an area.

Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized=*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained*. These classes are defined in the "Soil Survey Manual."

Drainageway. A general term for a course or channel along which water moves in draining an area. A term restricted to relatively small, linear depressions that at some time move concentrated water and either do not have a defined channel or have only a small defined channel.

Draw. A small stream valley that generally is more open and has broader bottom land than a ravine or gulch.

Drift. Pulverized and other rock material transported by glacial ice and then deposited. Also, the sorted and unsorted material deposited by streams flowing from glaciers.

Duff. A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

Ecological site. An area where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. An ecological site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other ecological sites in kind and/or proportion of species or in total production.

Effervescence. The gaseous response (observed as bubbles) of soil to applied hydrochloric acid (HCl) or other chemicals. A field or laboratory test to determine the presence of carbonates in the soil.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

End moraine. A moraine produced at the front of an actively flowing glacier at any given time.

Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Escarpment. A relatively continuous and steep slope or cliff, generally produced by erosion or faulting, breaking the general continuity of more gently sloping land surfaces. Exposed nonbedrock material is nonsoil material or very shallow, poorly developed soil. Typically 0.1 acre to 2 acres in size. Synonym: scarp.

Esker. A narrow, winding ridge of stratified gravelly and sandy drift deposited by a stream flowing in a tunnel beneath a glacier.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity*.

Filtering capacity (in tables). Because of rapid or very rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Fine textured soil. Sandy clay, silty clay, or clay.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flaggy soil material. Material that has, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

Floodplain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fluvial. Of or pertaining to rivers; produced by river action, as a fluvial plain.

Footslope. The geomorphic component that forms the inner, gently inclined surface at the base of a hillslope. The surface profile is dominantly concave. In terms of gradational processes, the footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

Forb. Any herbaceous plant not a grass or a sedge.

Forest cover. All trees and other woody plants (underbrush) covering the ground in a forest.

Forest type. A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil–forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Glaciofluvial deposits. Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.

Glaciolacustrine deposits. Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are interbedded or laminated.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Graded stripcropping. Growing crops in strips that grade toward a protected waterway.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravel pit. An open excavation from which soil and the loose underlying material have been removed and used as a source of sand or gravel, usually for construction purposes.

Gravelly soil material. Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Gravelly spot. An area in which the surface layer has more than 35 percent, by volume, rock fragments (mostly less than 3 inches in diameter) in an area of surrounding soil that has less than 15 percent rock fragments.

Green manure crop (agronomy). A soil–improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground moraine. An extensive, fairly even layer of till that has an uneven, undulating surface; a deposit of rock and mineral debris dragged along, in, on, and beneath a glacier and emplaced by processes including basal lodgment and release from downwasting stagnant ice by ablation.

Ground water. Water filling all the unblocked pores of the material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hard to reclaim (in tables). Reclamation is difficult after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Head out. To form a flower head.

Head slope. A geomorphic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainageway. The overland waterflow is converging.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.

High–residue crops. Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Hill. A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil–forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil–forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Igneous rock. Rock formed by solidification from a molten or partially molten state. Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Interfluve. An elevated area between two drainageways that sheds water to those drainageways.

Intermittent stream. A stream, or reach of a stream, that flows for prolonged periods only when it receives ground–water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Iron depletions. Low–chroma zones having a low content of iron and manganese oxide because of chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close–growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Kame. An irregular, short ridge or hill of stratified drift.

Karst (topography). The relief of an area underlain by limestone that dissolves in differing degrees, thus forming numerous depressions or small basins.

Knoll. A small, low, rounded hill rising above adjacent landforms.

Lacustrine deposit. Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Landfill. An area where waste products of human habitation are disposed. These products can be above or below natural ground level.

Landslide. The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Limestone. A sedimentary rock composed of calcium carbonate. There are many impure varieties.

Linear extensibility. Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is used to determine the shrink-swell potential of soils. It is an expression of the volume change between the water content of the clod at 1/3- or 1/10-bar tension (33kPa or 10kPa tension) and oven dryness. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Lithic contact. A boundary between soil and continuous, coherent underlying material. The underlying material must be sufficiently coherent to make hand digging with a spade impractical.

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.

Longshore bar. A narrow, elongate, coarse textured ridge that once rose near to, or barely above, a pluvial or glacial lake and extended generally parallel to the shore but was separated from it by an intervening trough or lagoon; both the bar and lagoon are now relict features.

Low–residue crops. Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

Low strength. The soil is not strong enough to support loads.

Marl. An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal amounts.

Marsh. A water–saturated, very poorly drained area, intermittently or permanently covered by water. Marsh areas dominantly support sedges, cattails, and rushes. Not used in map units where poorly drained or very poorly drained soils are the named components. Typically 0.5 acre to 2 acres in size.

Masses. Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil. Very fine sandy loam,

loam, silt loam, or silt.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon. A thick, dark, humus–rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Moraine. An accumulation of earth, stones, and other debris deposited by a glacier. Some types are terminal, lateral, medial, and ground.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance=*few, common,* and *many;* size=*fine, medium,* and *coarse;* and contrast=*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Mudstone. Sedimentary rock formed by induration of silt and clay in approximately equal amounts.

Mulch. Any material, such as straw, sawdust, leaves, plastic film, or loose soil, that is spread upon the surface of the soil to protect the soil and plant roots from the effects of raindrops, soil crusting, freezing, and evaporation.

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules. Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. If formed in place, nodules of iron oxide or manganese oxide are considered types of redoximorphic concentrations.

No–till farming. A method of planting crops that involves no seedbed preparation other than opening the soil for the purpose of placing the seed at the intended depth, which typically involves opening a small slit or punching a hole into the soil. There is usually no cultivation during crop production. Chemical weed control is normally used.

Nose slope. A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Outwash. Gravel, sand, and silt, commonly stratified, deposited by glacial meltwater.

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Paralithic contact. Similar to a lithic contact, except that the underlying material is softer and can be dug with difficulty with a spade.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Pebbles. Rounded or partially rounded rock or mineral fragments between 2 and 75 millimeters in diameter.

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 movement of water through the soil.

Perennial water. A natural or manmade lake, pool, pit, or stream course that contains water for most of the year.

Permafrost. Layers of soil, or even bedrock, occurring in arctic or subarctic regions, in which a temperature below freezing has existed continuously for a long time.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Impermeable	less than 0.0015
Very slow	0.0015 to 0.06
Slow	0.06 to 0.2
Moderately slow	0.2 to 0.6
Moderate	0.6 to 2.0
Moderately rapid	2.0 to 6.0
Rapid	6.0 to 20
Very rapid	more than 20

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Potential native plant community. See Climax plant community.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning. Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Quarry. An open excavation from which bedrock has been removed.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Red beds. Sedimentary strata that are mainly red and are made up largely of sandstone and shale.

Redoximorphic concentrations. Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

Redoximorphic depletions. Low–chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

Redoximorphic features. Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha, alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

Reduced matrix. A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Restricted permeability (in tables). The slow movement of water through the soil adversely affects the specified use.

Rill. A steep–sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Rise. A geomorphic component of flat plains (e.g., lake plain, low coastal plain, low–gradient till plain) consisting of a slightly elevated but low, broad area with slow slope gradients (*i.e., slopes of 1 to 3 percent);*

typically a microfeature but can be fairly extensive. Commonly, soils on a rise are better drained than those in the surrounding flat area.

Riser. The sloping surface of a series of natural steplike landforms, as those of successive stream terraces.

Road cut. A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rock outcrop. Exposures of base bedrock, typically hard rock, at the surface of the earth.

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 groundwater runoff or seepage flow from groundwater.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand–sized particles.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Scarification. The act of abrading, scratching, loosening, crushing, or modifying the surface to increase water absorption or to provide a more tillable soil.

Second bottom. The first terrace above the normal flood plain (or first bottom) of a river.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind–deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Short steep slope. A narrow area in which the soil has slopes that are at least two slope classes steeper than the slope class of the surrounding map unit.

Shoulder. The position that forms the uppermost inclined surface near the top of a hillslope. It is a transition from backslope to summit. The surface is dominantly convex in profile and erosional in origin.

Shrink–swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Side slope. A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt–sized particles.

Sinkhole. A depression in the landscape where limestone has been dissolved.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Slick spot. A small area of soil having a puddled, crusted, or smooth surface and an excess of exchangeable sodium. The soil generally is silty or clayey, is slippery when wet, and is low in productivity.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Sloughed till. Water-saturated till that has flowed slowly downhill from its original place of deposit by glacial ice. It may rest on other till, on outwash, or on a glaciolacustrine deposit.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Stone line. A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsidence. The loss in volume that occurs in muck soils when they oxidize or dry.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summit. The topographically highest position of a hillslope. It has a nearly level (planar or only slightly convex) surface.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Swamp. An area that is saturated with water throughout much of the year but in which the surface of the soil is generally not deeply submerged. Swamp areas dominantly support trees and shrubs.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

Terminal moraine. A belt of thick drift that generally marks the termination of important glacial advances.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material that is too thin for the specified use.

Till. Unsorted, nonstratified drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Till plain. An extensive area of nearly level to undulating soils underlain by till.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope. The position that forms the gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed–depression floors.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Tread. The flat or gently sloping surface of natural steplike landforms, commonly one of a series, such as successive stream terraces.

Typical pedon. The site of the pedon described as typical for the series in the survey area.

Upland. 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.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Varve. A sedimentary layer or a lamina or sequence of laminae deposited in a body of still water within a year. Specifically, a thin pair of graded glaciolacustrine layers seasonally deposited, usually by meltwater streams, in a glacial lake or other body of still water in front of a glacier.

Water bars. Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.

Water table. The upper surface of ground water, or the level below which the soil is saturated with water.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wet spot. An area of soil that is somewhat poorly drained to very poorly drained and that is at least two drainage classes wetter than the named soils in the surrounding map unit.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Windthrow. The uprooting and tipping over of trees by the wind.

TABLES

TABLE 1.--TEMPERATURE AND PRECIPITATION

(Recorded in the period 1971-2000 at DEFIANCE, OH2098.
See text on page 10 for additional information.)

Month	Temperature (Degrees F.) avg daily max	avg daily min	avg	2 yrs in 10 will have max temp. >than	2 yrs in 10 will have min temp. <than	avg # of grow deg days*	Precipitation (Inches) avg	2 yrs in 10 will have less than	2 yrs in 10 will have more than	avg # of days w/.1 or more	avg total snow fall
January	31.3	15.0	23.2	59	-14	1	1.92	1.07	2.71	5	7.0
February	35.2	17.5	26.3	64	-10	2	1.84	0.82	2.81	4	5.3
March	46.1	26.5	36.3	77	4	22	2.65	1.67	3.66	6	2.4
April	59.1	36.4	47.7	84	18	86	3.30	2.05	4.46	7	0.6
May	71.2	47.5	59.3	90	31	306	3.62	2.43	4.80	7	0.0
June	80.6	57.4	69.0	96	41	569	3.78	2.04	5.50	6	0.0
July	84.5	61.5	73.0	98	49	710	3.89	2.13	5.56	6	0.0
August	82.3	59.5	70.9	95	46	646	3.19	1.68	4.40	6	0.0
September	75.4	52.0	63.7	92	35	414	3.23	1.50	4.80	5	0.0
October	63.1	40.7	51.9	84	24	143	2.59	1.44	3.56	5	0.1
November	48.7	31.5	40.1	73	13	28	2.94	1.45	4.32	6	1.2
December	36.5	21.3	28.9	63	-5	4	2.64	1.56	3.64	6	5.2
Yearly :											
Average	59.5	38.9	49.2	---	---	---	----	----	----	---	---
Extreme	104	-22	---	99	-16	---	----	----	----	---	---
Total	---	---	---	---	---	2931	35.59	30.88	39.66	69	21.8

Average # of days per year with at least 1 inch of snow on the ground: 40

*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 (Threshold : 50.0 deg. F)

TABLE 2.--FREEZE DATES IN SPRING AND FALL

(Recorded in the period 1971-2000 at DEFIANCE, OH2098. See text on page 10 for additional information.)

Probability	Temperature		
	24F or lower	28F or lower	32F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	April 16	April 26	May 10
2 year in 10 later than--	April 12	April 22	May 4
5 year in 10 later than--	April 4	April 13	April 23
First freezing temperature in fall:			
1 yr in 10 earlier than--	October 22	October 10	September 30
2 yr in 10 earlier than--	October 29	October 16	October 5
5 yr in 10 earlier than--	November 11	October 28	October 16

TABLE 3.--GROWING SEASON

(Recorded for the period 1971-2000 at DEFIANCE, OH2098. See text on page 10 for additional information.)

Probability	Daily Minimum Temperature		
	# days > 24F	# days > 28F	# days > 32F
9 years in 10	193	171	147
8 years in 10	202	179	157
5 years in 10	219	196	175
2 years in 10	237	213	194
1 year in 10	246	222	204

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE MAP UNITS

Map symbol	Soil name	Acres	Percent
Ad	Adrian muck	144	*
ArB	Arkport fine sand, 2 to 6 percent slopes	208	*
ArC	Arkport fine sand, 6 to 12 percent slopes	107	*
AsA	Aurand fine sandy loam, 0 to 2 percent slopes	---	*
AtA	Aurand loam, 0 to 2 percent slopes	---	*
BcA	Bixler loamy fine sand, 0 to 3 percent slopes	---	*
Ca	Clay pits	124	*
Ch	Cohoctah fine sandy loam	100	*
Ck	Colwood fine sandy loam, 0 to 1 percent slopes	---	*
Cm	Colwood loam, 0 to 1 percent slopes	---	*
Cn	Colwood loam	2,391	0.9
Co	Colwood silt loam	501	0.2
Cu	Cut and fill land	581	0.2
DeA	Del Rey loam, 0 to 2 percent slopes	521	0.2
DfA	Del Rey silt loam, 0 to 2 percent slopes	701	0.3
DuA	Digby fine sandy loam, 0 to 2 percent slopes	1,004	0.4
DyA	Digby loam, 0 to 2 percent slopes	1,463	0.5
DzA	Digby loam, 0 to 3 percent slopes	---	*
Ee	Eel loam, 0 to 2 percent slopes, frequently flooded	---	*
FsA	Fulton loam, 0 to 2 percent slopes	2,088	0.8
FsB	Fulton loam, 2 to 6 percent slopes	291	0.1
FuA	Fulton silty clay loam, 0 to 2 percent slopes	2,741	1.0
FuB	Fulton silty clay loam, 2 to 6 percent slopes	481	0.2
FvA	Fulton loam, sandy subsoil variant, 0 to 2 percent slopes	226	*
GaA	Galen fine sand, 0 to 2 percent slopes	129	*
GaB	Galen fine sand, 2 to 6 percent slopes	1,073	0.4
GbB	Galen loamy fine sand, 1 to 6 percent slopes	---	*
Gm	Genesee loam	372	0.1
Go	Gilford fine sandy loam	2,547	0.9
Gr	Granby loamy fine sand	6,281	2.3
Gv	Gravel pits	17	*
HaA	Haney fine sandy loam, 0 to 2 percent slopes	150	*
HaB	Haney fine sandy loam, 2 to 6 percent slopes	160	*
HdA	Haney loam, 0 to 2 percent slopes	394	0.1
HdB	Haney loam, 2 to 6 percent slopes	233	*
HeC	Haney and Rawson loams, 6 to 12 percent slopes	92	*
HkA	Haskins fine sandy loam, 0 to 2 percent slopes	2,403	0.9
HlA	Haskins loam, 0 to 2 percent slopes	5,148	1.9
HlB	Haskins loam, 2 to 6 percent slopes	---	*
HnA	Haskins fine sandy loam, stratified substratum, 0 to 2 percent slopes	2,221	0.8
Ho	Hoytville clay loam	803	0.3
Hp	Hoytville silty clay loam, 0 to 1 percent slopes	---	*
Hr	Hoytville clay loam, 0 to 1 percent slopes	---	*
Hs	Hoytville silty clay, 0 to 1 percent slopes	---	*
Hv	Hoytville clay	142,654	53.1
Hw	Hoytville clay, thin solum variant	166	*
KeA	Kibbie loamy fine sand, 0 to 2 percent slopes	---	*
KfA	Kibbie fine sandy loam, 0 to 2 percent slopes	758	0.3
KlA	Kibbie loam, 0 to 2 percent slopes	442	0.2
La	Latty clay	3,137	1.2
Lb	Latty silty clay	---	*
Le	Lenawee loam	353	0.1
Lf	Lenawee silty clay loam	3,130	1.2
LwB2	Lucas silty clay loam, 2 to 6 percent slopes, moderately eroded	133	*
LwC2	Lucas silty clay loam, 6 to 12 percent slopes, moderately eroded	173	*
LxC3	Lucas silty clay, 6 to 12 percent slopes, severely eroded	373	0.1
LxE3	Lucas silty clay, 12 to 45 percent slopes, severely eroded	481	0.2
Mb	Mermill-Aurand complex, 0 to 1 percent slopes	---	*
Mc	Mermill silty clay loam	---	*
Md	Medway silt loam	296	0.1
Me	Mermill loam	8,813	3.3
Mf	Mermill clay loam	4,287	1.6
Mg	Mermill loam, stratified substratum	3,216	1.2
Mh	Millgrove loam	13,707	5.1
Mk	Millgrove clay loam	853	0.3
NaA	Nappanee loam, 0 to 2 percent slopes	2,778	1.0
NaB	Nappanee loam, 2 to 6 percent slopes	240	*
NtA	Nappanee silty clay loam, 0 to 2 percent slopes	11,183	4.2
NtB	Nappanee silty clay loam, 2 to 6 percent slopes	590	0.2
NtB2	Nappanee silty clay loam, 2 to 6 percent slopes, moderately eroded	281	0.1
OaC	Oakville fine sand, 2 to 12 percent slopes	746	0.3
ObB	Oakville fine sand, 2 to 6 percent slopes	---	*
ObC	Oakville fine sand, 6 to 12 percent slopes	---	*
OsB	Oshtemo sandy loam, 2 to 6 percent slopes	349	0.1
OtB	Ottokee fine sand, 1 to 5 percent slopes	5,557	2.1
OuB	Ottokee fine sand, 0 to 6 percent slopes	---	*

See footnote at end of table.

Table 4.--Acreage and Proportionate Extent of the Map Units--Continued

Map symbol	Soil name	Acres	Percent
OzB	Ottokee-Spinks loamy fine sands, 2 to 6 percent slopes	---	*
Pa	Paulding clay	642	0.2
Pt	Pits, quarry	---	*
RaB	Rawson sandy loam, 2 to 6 percent slopes	106	*
RdB	Rawson loam, 2 to 6 percent slopes	129	*
ReB	Rawson fine sandy loam, stratified substratum, 2 to 6 percent slopes	85	*
RfA	Rimer loamy fine sand, 0 to 2 percent slopes	2,564	1.0
RgA	Rimer loamy fine sand, 0 to 3 percent slopes	---	*
RhB	Rimer and Tedrow, till substratum, loamy fine sands, 2 to 6 percent slopes	---	*
RmA	Rimer loamy fine sand, stratified substratum, 0 to 2 percent slopes	1,792	0.7
RoA	Roselms silty clay loam, 0 to 2 percent slopes	96	*
RrA	Roselms silty clay, 0 to 2 percent slopes	---	*
Rs	Ross loam	547	0.2
SaE3	St. Clair clay, 18 to 35 percent slopes, severely eroded	---	*
SbB2	St. Clair silty clay loam, 2 to 6 percent slopes, moderately eroded	152	*
SbC2	St. Clair silty clay loam, 6 to 12 percent slopes, moderately eroded	258	*
SbD2	St. Clair silty clay loam, 12 to 18 percent slopes, eroded	---	*
SbE2	St. Clair silty clay loam, 18 to 25 percent slopes, eroded	---	*
ScC3	St. Clair silty clay, 6 to 12 percent slopes, severely eroded	272	0.1
ScD3	St. Clair silty clay, 12 to 18 percent slopes, severely eroded	438	0.2
ScE3	St. Clair silty clay, 18 to 25 percent slopes, severely eroded	113	*
ScF3	St. Clair silty clay, 25 to 45 percent slopes, severely eroded	484	0.2
SdB	Seward loamy fine sand, 2 to 6 percent slopes	785	0.3
SdC	Seward loamy fine sand, 6 to 12 percent slopes	108	*
SdD	Seward loamy fine sand, 12 to 18 percent slopes	55	*
SeB	Seward loamy fine sand, stratified substratum, 2 to 6 percent slopes	451	0.2
SeC	Seward loamy fine sand, stratified substratum, 6 to 12 percent slopes	118	*
SfA	Shinrock silt loam, sandy subsoil variant, 0 to 2 percent slopes	162	*
Sh	Shoals silt loam	1,575	0.6
Sm	Sloan silty clay loam, 0 to 1 percent slopes, frequently flooded	---	*
Sn	Sloan loam, occasionally flooded	---	*
So	Sloan silty clay loam	1,975	0.7
SpB	Spinks fine sand, 2 to 6 percent slopes	156	*
SpC	Spinks fine sand, 6 to 12 percent slopes	218	*
SpD	Spinks fine sand, 12 to 18 percent slopes	66	*
TdA	Tedrow loamy fine sand, 0 to 2 percent slopes	3,029	1.1
TeA	Tedrow loamy fine sand, silty subsoil variant, 0 to 2 percent slopes	294	0.1
To	Toledo silty clay loam	3,984	1.5
Tt	Toledo silty clay	3,263	1.2
TuB2	Tuscola loam, 2 to 6 percent slopes, moderately eroded	153	*
TuC2	Tuscola loam, 6 to 12 percent slopes, moderately eroded	183	*
Ud	Udorthents, rolling	---	*
Ur	Urban land	285	0.1
VaA	Vaughnsville loam, 0 to 2 percent slopes	65	*
W	Water	398	0.1
Wa	Wabasha silty clay	563	0.2
Wc	Warners muck	67	*
Wf	Wauseon fine sandy loam	140	*
Wg	Wauseon loamy fine sand, stratified substratum	78	*
	Total	266,240	99.1

--- Will be updated upon delivery of SSURGO certified spatial information
* 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. See text on page 180 for additional information.)

Map symbol	Soil name
ArB	Arkport fine sand, 2 to 6 percent slopes
AsA	Aurand fine sandy loam, 0 to 2 percent slopes (Prime farmland if drained)
AtA	Aurand loam, 0 to 2 percent slopes (Prime farmland if drained)
BcA	Bixler loamy fine sand, 0 to 3 percent slopes
Ch	Cohoctah fine sandy loam (Prime farmland if drained)
Ck	Colwood fine sandy loam, 0 to 1 percent slopes (Prime farmland if drained)
Cm	Colwood loam, 0 to 1 percent slopes (Prime farmland if drained)
Cn	Colwood loam (Prime farmland if drained)
Co	Colwood silt loam (Prime farmland if drained)
DeA	Del Rey loam, 0 to 2 percent slopes (Prime farmland if drained)
DfA	Del Rey silt loam, 0 to 2 percent slopes (Prime farmland if drained)
DuA	Digby fine sandy loam, 0 to 2 percent slopes (Prime farmland if drained)
DyA	Digby loam, 0 to 2 percent slopes (Prime farmland if drained)
DzA	Digby loam, 0 to 3 percent slopes (Prime farmland if drained)
Ee	Eel loam, 0 to 2 percent slopes, frequently flooded (Prime farmland if protected from flooding or not frequently flooded during the growing season)
FsA	Fulton loam, 0 to 2 percent slopes (Prime farmland if drained)
FsB	Fulton loam, 2 to 6 percent slopes (Prime farmland if drained)
FuA	Fulton silty clay loam, 0 to 2 percent slopes (Prime farmland if drained)
FuB	Fulton silty clay loam, 2 to 6 percent slopes (Prime farmland if drained)
FvA	Fulton loam, sandy subsoil variant, 0 to 2 percent slopes (Prime farmland if drained)
GaA	Galen fine sand, 0 to 2 percent slopes
GaB	Galen fine sand, 2 to 6 percent slopes
GbB	Galen loamy fine sand, 1 to 6 percent slopes
Gm	Genesee loam
Go	Gilford fine sandy loam (Prime farmland if drained)
HaA	Haney fine sandy loam, 0 to 2 percent slopes
HaB	Haney fine sandy loam, 2 to 6 percent slopes
HdA	Haney loam, 0 to 2 percent slopes
HdB	Haney loam, 2 to 6 percent slopes
HkA	Haskins fine sandy loam, 0 to 2 percent slopes (Prime farmland if drained)
HlA	Haskins loam, 0 to 2 percent slopes (Prime farmland if drained)
HlB	Haskins loam, 2 to 6 percent slopes (Prime farmland if drained)
HnA	Haskins fine sandy loam, stratified substratum, 0 to 2 percent slopes (Prime farmland if drained)
Ho	Hoytville clay loam (Prime farmland if drained)
Hp	Hoytville silty clay loam, 0 to 1 percent slopes (Prime farmland if drained)
Hr	Hoytville clay loam, 0 to 1 percent slopes (Prime farmland if drained)
Hs	Hoytville silty clay, 0 to 1 percent slopes (Prime farmland if drained)
Hv	Hoytville clay (Prime farmland if drained)
Hw	Hoytville clay, thin solum variant (Prime farmland if drained)
KeA	Kibbie loamy fine sand, 0 to 2 percent slopes (Prime farmland if drained)
KfA	Kibbie fine sandy loam, 0 to 2 percent slopes (Prime farmland if drained)
KlA	Kibbie loam, 0 to 2 percent slopes (Prime farmland if drained)
La	Latty clay (Prime farmland if drained)
Lb	Latty silty clay (Prime farmland if drained)
Le	Lenawee loam (Prime farmland if drained)
Lf	Lenawee silty clay loam (Prime farmland if drained)
LwB2	Lucas silty clay loam, 2 to 6 percent slopes, moderately eroded
Mb	Mermill-Aurand complex, 0 to 1 percent slopes (Prime farmland if drained)
Mc	Mermill silty clay loam (Prime farmland if drained)
Md	Medway silt loam
Me	Mermill loam (Prime farmland if drained)
Mf	Mermill clay loam (Prime farmland if drained)
Mg	Mermill loam, stratified substratum (Prime farmland if drained)
Mh	Millgrove loam (Prime farmland if drained)
Mk	Millgrove clay loam (Prime farmland if drained)
NaA	Nappanee loam, 0 to 2 percent slopes (Prime farmland if drained)
NaB	Nappanee loam, 2 to 6 percent slopes (Prime farmland if drained)
NtA	Nappanee silty clay loam, 0 to 2 percent slopes (Prime farmland if drained)
NtB	Nappanee silty clay loam, 2 to 6 percent slopes (Prime farmland if drained)
NtB2	Nappanee silty clay loam, 2 to 6 percent slopes, moderately eroded (Prime farmland if drained)
OsB	Oshtemo sandy loam, 2 to 6 percent slopes
OuB	Ottokee fine sand, 0 to 6 percent slopes (Farmland of local importance)

Table 5.--PRIME FARMLAND--Continued

Map symbol	Soil name
RaB	Rawson sandy loam, 2 to 6 percent slopes
RdB	Rawson loam, 2 to 6 percent slopes
ReB	Rawson fine sandy loam, stratified substratum, 2 to 6 percent slopes
RfA	Rimer loamy fine sand, 0 to 2 percent slopes (Prime farmland if drained)
RgA	Rimer loamy fine sand, 0 to 3 percent slopes (Prime farmland if drained)
RhB	Rimer and Tedrow, till substratum, loamy fine sands, 2 to 6 percent slopes (Prime farmland if drained)
RmA	Rimer loamy fine sand, stratified substratum, 0 to 2 percent slopes (Prime farmland if drained)
Rs	Ross loam
SbB2	St. Clair silty clay loam, 2 to 6 percent slopes, moderately eroded
SfA	Shinrock silt loam, sandy subsoil variant, 0 to 2 percent slopes
Sh	Shoals silt loam (Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season)
Sm	Sloan silty clay loam, 0 to 1 percent slopes, frequently flooded (Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season)
Sn	Sloan loam, occasionally flooded (Prime farmland if drained)
So	Sloan silty clay loam (Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season)
To	Toledo silty clay loam (Prime farmland if drained)
Tt	Toledo silty clay (Prime farmland if drained)
TuB2	Tuscola loam, 2 to 6 percent slopes, moderately eroded
VaA	Vaughnsville loam, 0 to 2 percent slopes
Wa	Wabasha silty clay (Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season)
Wf	Wauseon fine sandy loam (Prime farmland if drained)
Wg	Wauseon loamy fine sand, stratified substratum (Prime farmland if drained)

TABLE 6.--HYDRIC SOILS LIST

(See text on page 182 for additional information)

Map symbol	Soil name
Ad	Adrian muck
Ch	Cohoctah fine sandy loam
Ck	Colwood fine sandy loam, 0 to 1 percent slopes
Cm	Colwood loam, 0 to 1 percent slopes
Cn	Colwood loam
Co	Colwood silt loam
Go	Gilford fine sandy loam
Gr	Granby loamy fine sand
Ho	Hoytville clay loam
Hp	Hoytville silty clay loam, 0 to 1 percent slopes
Hr	Hoytville clay loam, 0 to 1 percent slopes
Hs	Hoytville silty clay, 0 to 1 percent slopes
Hv	Hoytville clay
Hw	Hoytville clay, thin solum variant
La	Latty clay
Lb	Latty silty clay
Le	Lenawee loam
Lf	Lenawee silty clay loam
Mb	Mermill-Aurand complex, 0 to 1 percent slopes
Mc	Mermill silty clay loam
Me	Mermill loam
Mf	Mermill clay loam
Mg	Mermill loam, stratified substratum
Mh	Millgrove loam
Mk	Millgrove clay loam
Pa	Paulding clay
Sm	Sloan silty clay loam, 0 to 1 percent slopes, frequently flooded
Sn	Sloan loam, occasionally flooded
So	Sloan silty clay loam
To	Toledo silty clay loam
Tt	Toledo silty clay
Wa	Wabasha silty clay
Wc	Warners muck
Wf	Wauseon fine sandy loam
Wg	Wauseon loamy fine sand, stratified substratum

TABLE 7.--NON-HYDRIC MAPUNITS WITH HYDRIC COMPONENTS

(See text on page 182 for additional information)

Map symbol and map unit name	Hydric Component	Landform
AsA: Aurand fine sandy loam, 0 to 2 percent slopes		
	Mermill	depression on lake plain drainageway on lake plain
	Alvada	depression on lake plain drainageway on lake plain
AtA: Aurand loam, 0 to 2 percent slopes		
	Mermill	depression on lake plain drainageway on lake plain
	Alvada	drainageway on lake plain depression on lake plain
BcA: Bixler loamy fine sand, 0 to 3 percent slopes		
	Colwood	drainageway on outwash plain depression on outwash plain drainageway on beach ridge depression on beach ridge drainageway on delta depression on delta
	Lamson	depression on delta drainageway on delta drainageway on beach ridge depression on beach ridge depression on outwash plain drainageway on outwash plain
DyA: Digby loam, 0 to 2 percent slopes		
	Millgrove	flat depression
	Hoytville	depression flat
	Mermill	depression flat
DzA: Digby loam, 0 to 3 percent slopes		
	Millgrove	depression drainageway

Table 7.--Non-hydric Mapunits With Hydric Components—Continued

Map symbol and map unit name	Hydric Component	Landform
FsA: Fulton loam, 0 to 2 percent slopes		
	Toledo	flat
FuA: Fulton silty clay loam, 0 to 2 percent slopes		
	Toledo	flat
FvA: Fulton loam, sandy subsoil variant, 0 to 2 percent slopes		
	Toledo	flat
GbB: Galen loamy fine sand, 1 to 6 percent slopes		
	Gilford	depression on beach ridge drainageway on beach ridge depression on dune drainageway on dune depression on moraine drainageway on moraine
	Granby	drainageway on moraine depression on moraine drainageway on dune depression on dune drainageway on beach ridge depression on beach ridge
HaA: Haney fine sandy loam, 0 to 2 percent slopes		
	Millgrove	flat
	Hoytville	flat
	Mermill	flat
HaB: Haney fine sandy loam, 2 to 6 percent slopes		
	Mermill	flat
	Hoytville	flat
HdA: Haney loam, 0 to 2 percent slopes		
	Millgrove	flat
HkA: Haskins fine sandy loam, 0 to 2 percent slopes		
	Mermill	flat
	Hoytville	flat
HlA: Haskins loam, 0 to 2 percent slopes		
	Mermill	flat
	Hoytville	flat

Table 7.--Non-hydric Mapunits With Hydric Components—Continued

Map symbol and map unit name	Hydric Component	Landform
HlB: Haskins loam, 2 to 6 percent slopes		
	Hoytville	depression drainageway
	Pewamo	depression drainageway
	Sloan	flood plain
HnA: Haskins fine sandy loam, stratified substratum, 0 to 2 percent slopes		
	Mermill, stratified substratum	flat
NaA: Nappanee loam, 0 to 2 percent slopes		
	Hoytville	flat
NaB: Nappanee loam, 2 to 6 percent slopes		
	Hoytville	flat
NtA: Nappanee silty clay loam, 0 to 2 percent slopes		
	Hoytville	flat
NtB: Nappanee silty clay loam, 2 to 6 percent slopes		
	Hoytville	flat
ObB: Oakville fine sand, 2 to 6 percent slopes		
	Granby	drainageway depression
OuB: Ottokee fine sand, 0 to 6 percent slopes		
	Gilford	depression on beach ridge drainageway on beach ridge depression on dune drainageway on dune depression on moraine drainageway on moraine
	Granby	drainageway on moraine depression on moraine drainageway on dune depression on dune drainageway on beach ridge depression on beach ridge
RaB: Rawson sandy loam, 2 to 6 percent slopes		
	Mermill	flat
	Hoytville	flat

Table 7.--Non-hydric Mapunits With Hydric Components—Continued

Map symbol and map unit name	Hydric Component	Landform
RdB: Rawson loam, 2 to 6 percent slopes		
	Hoytville	flat
	Mermill	flat
RfA: Rimer loamy fine sand, 0 to 2 percent slopes		
	Mermill	flat
	Hoytville	flat
RgA: Rimer loamy fine sand, 0 to 3 percent slopes		
	Mermill	depression on outwash plain depression on delta depression on beach ridge
RhB: Rimer and Tedrow, till substratum, loamy fine sands, 2 to 6 percent slopes		
	Wauseon	drainageway on lake plain depression on lake plain
RmA: Rimer loamy fine sand, stratified substratum, 0 to 2 percent slopes		
	Mermill loam, stratified substratum	flat
RoA: Roselms silty clay loam, 0 to 2 percent slopes		
	Paulding	flat
RrA: Roselms silty clay, 0 to 2 percent slopes		
	Paulding	drainageway
SdB: Seward loamy fine sand, 2 to 6 percent slopes		
	Mermill	flat
	Hoytville	flat
SfA: Shinrock silt loam, sandy subsoil variant, 0 to 2 percent slopes		
	dark colored, very poorly drained soils	flat
Sh: Shoals silt loam		
	Sloan	flood plain
TdA: Tedrow loamy fine sand, 0 to 2 percent slopes		
	Granby	flat
TeA: Tedrow loamy fine sand, silty subsoil variant, 0 to 2 percent slopes		
	Colwood	flat

TABLE 8.--CROPLAND LIMITATIONS AND HAZARDS

(See text on page 186 for a description of the limitations and hazards listed in this table. Only soils suitable for cultivated crops are listed in this table.)

Soil name and map symbol	Cropland limitations and hazards
Ad:	
Adrian	Ponding, high potential for ground-water pollution, excessive acidity, frost action, subsidence of the muck, very high organic matter content, wind erosion, sandy layers,
ArB:	
Arkport	High potential for ground-water pollution, erosion hazard, wind erosion, limited available water capacity, sandy layers,
ArC:	
Arkport	High potential for ground-water pollution, erosion hazard, wind erosion, sandy layers,
AsA:	
Aurand	Seasonal high water table, frost action, wind erosion,
AtA:	
Aurand	Seasonal high water table, frost action,
BcA:	
Bixler	High potential for ground-water pollution, frost action, wind erosion, sandy layers,
Ch:	
Cohoctah	Occasional flooding, seasonal high water table, high potential for ground-water pollution, frost action, wind erosion, limited available water capacity,
Ck:	
Colwood	Ponding, moderate potential for ground-water pollution, frost action, wind erosion,
Cm:	
Colwood	Ponding, moderate potential for ground-water pollution, frost action,
Cn:	
Colwood	Ponding, moderate potential for ground-water pollution, frost action,
Co:	
Colwood	Ponding, surface compaction, moderate potential for ground-water pollution, frost action,
DeA:	
Del Rey	Seasonal high water table, moderate potential for ground-water pollution, frost action,
DfA:	
Del Rey	Seasonal high water table, surface compaction, moderate potential for ground-water pollution, frost action, surface crusting,
DuA:	
Digby	Seasonal high water table, high potential for ground-water pollution, frost action, wind erosion,
DyA:	
Digby	Seasonal high water table, high potential for ground-water pollution, frost action,

TABLE 8.--Cropland Limitations and Hazards--Continued

Soil name and map symbol	Cropland limitations and hazards
DzA:	
Digby	Seasonal high water table, high potential for ground-water pollution, frost action,
Ee:	
Eel	Frequent flooding, moderate potential for ground-water pollution, frost action,
FsA:	
Fulton	Seasonal high water table, high clay content,
FsB:	
Fulton	Seasonal high water table, erosion hazard, high clay content,
FuA:	
Fulton	Seasonal high water table, surface compaction, fair tilth, surface crusting, clodding, high clay content,
FuB:	
Fulton	Seasonal high water table, surface compaction, fair tilth, surface crusting, erosion hazard, clodding, high clay content,
FvA:	
Fulton Variant	Seasonal high water table, moderate potential for ground-water pollution, frost action, high clay content,
GaA:	
Galen	High potential for ground-water pollution, wind erosion, sandy layers,
GaB:	
Galen	High potential for ground-water pollution, erosion hazard, wind erosion, sandy layers,
GbB:	
Galen	Moderate potential for ground-water pollution, erosion hazard, wind erosion, sandy layers,
Gm:	
Genesee	Occasional flooding,
Go:	
Gilford	Ponding, high potential for ground-water pollution, frost action, wind erosion, limited available water capacity,
Gr:	
Granby	Ponding, high potential for ground-water pollution, wind erosion, limited available water capacity, sandy layers,
HaA:	
Haney	High potential for ground-water pollution, frost action, wind erosion,
HaB:	
Haney	High potential for ground-water pollution, frost action, erosion hazard, wind erosion,
HdA:	
Haney	High potential for ground-water pollution, frost action,

TABLE 8.--Cropland Limitations and Hazards--Continued

Soil name and map symbol	Cropland limitations and hazards
HdB:	
Haney	High potential for ground-water pollution, frost action, erosion hazard,
HeC:	
Haney	High potential for ground-water pollution, frost action, easily eroded, erosion hazard,
Rawson	Easily eroded, erosion hazard, high clay content,
HkA:	
Haskins	Seasonal high water table, frost action, wind erosion, restricted permeability, high clay content,
HlA:	
Haskins	Seasonal high water table, frost action, restricted permeability, high clay content,
HlB:	
Haskins	Seasonal high water table, frost action, erosion hazard, restricted permeability, high clay content,
HnA:	
Haskins	Seasonal high water table, frost action, wind erosion, restricted permeability, high clay content,
Ho:	
Hoytville	Ponding, surface compaction, frost action, fair tilth, clodding, high clay content,
Hp:	
Hoytville	Ponding, surface compaction, frost action, fair tilth, clodding, high clay content,
Hr:	
Hoytville	Ponding, surface compaction, frost action, fair tilth, clodding, high clay content,
Hs:	
Hoytville	Ponding, surface compaction, poor tilth, frost action, clodding, high clay content,
Hv:	
Hoytville	Ponding, surface compaction, poor tilth, frost action, clodding, high clay content,
Hw:	
Hoytville Variant	Ponding, surface compaction, poor tilth, frost action, limited available water capacity, clodding, high clay content,
KeA:	
Kibbie	Seasonal high water table, moderate potential for ground-water pollution, frost action, wind erosion,
KfA:	
Kibbie	Seasonal high water table, moderate potential for ground-water pollution, frost action, wind erosion,
KlA:	
Kibbie	Seasonal high water table, moderate potential for ground-water pollution, frost action,

TABLE 8.--Cropland Limitations and Hazards—Continued

Soil name and map symbol	Cropland limitations and hazards
La:	
Latty	Ponding, surface compaction, moderate potential for ground-water pollution, poor tilth, clodding, high clay content,
Lb:	
Latty	Ponding, surface compaction, poor tilth, clodding, high clay content,
Le:	
Lenawee	Ponding, moderate potential for ground-water pollution, frost action,
Lf:	
Lenawee	Ponding, surface compaction, moderate potential for ground-water pollution, frost action, fair tilth,
LwB2:	
Lucas	Part of the surface layer removed by erosion, surface compaction, fair tilth, surface crusting, erosion hazard, clodding, high clay content,
LwC2:	
Lucas	Part of the surface layer removed by erosion, surface compaction, fair tilth, surface crusting, easily eroded, erosion hazard, clodding, high clay content,
LxC3:	
Lucas	Most of the surface layer removed by erosion, surface compaction, poor tilth, easily eroded, erosion hazard, clodding, high clay content,
Mb:	
Mermill	Ponding, frost action, restricted permeability,
Aurand	Seasonal high water table, frost action,
Mc:	
Mermill	Ponding, surface compaction, moderate potential for ground-water pollution, frost action, fair tilth, restricted permeability, high clay content,
Md:	
Medway	Occasional flooding, surface compaction, moderate potential for ground-water pollution, frost action,
Me:	
Mermill	Ponding, frost action, high clay content,
Mf:	
Mermill	Ponding, surface compaction, frost action, fair tilth, high clay content,
Mg:	
Mermill	Ponding, frost action, high clay content,
Mh:	
Millgrove	Ponding, high potential for ground-water pollution, frost action,
Mk:	
Millgrove	Ponding, surface compaction, high potential for ground-water pollution, frost action, fair tilth,
NaA:	
Nappanee	Seasonal high water table, restricted permeability, high clay content,

TABLE 8.--Cropland Limitations and Hazards—Continued

Soil name and map symbol	Cropland limitations and hazards
NaB:	
Nappanee	Seasonal high water table, erosion hazard, restricted permeability, high clay content,
NtA:	
Nappanee	Seasonal high water table, surface compaction, poor tilth, surface crusting, restricted permeability, clodding, high clay content,
NtB:	
Nappanee	Seasonal high water table, surface compaction, poor tilth, surface crusting, erosion hazard, restricted permeability, clodding, high clay content,
NtB2:	
Nappanee	Part of the surface layer removed by erosion, seasonal high water table, surface compaction, poor tilth, surface crusting, erosion hazard, restricted permeability, clodding, high clay content,
OaC:	
Oakville	High potential for ground-water pollution, erosion hazard, wind erosion, limited available water capacity, sandy layers,
ObB:	
Oakville	High potential for ground-water pollution, erosion hazard, wind erosion, limited available water capacity, sandy layers,
ObC:	
Oakville	High potential for ground-water pollution, erosion hazard, wind erosion, limited available water capacity, sandy layers,
OsB:	
Oshtemo	Moderate potential for ground-water pollution, erosion hazard, wind erosion,
OtB:	
Ottokee	High potential for ground-water pollution, erosion hazard, wind erosion, limited available water capacity, sandy layers,
OuB:	
Ottokee	High potential for ground-water pollution, erosion hazard, wind erosion, limited available water capacity, sandy layers,
OzB:	
Ottokee	High potential for ground-water pollution, erosion hazard, wind erosion, limited available water capacity, sandy layers,
Spinks	High potential for ground-water pollution, erosion hazard, wind erosion, limited available water capacity, sandy layers,
Pa:	
Paulding	Ponding, surface compaction, moderate potential for ground-water pollution, poor tilth, restricted permeability, clodding, very high clay content,
RaB:	
Rawson	Erosion hazard, wind erosion, high clay content,
RdB:	
Rawson	Erosion hazard, high clay content,

TABLE 8.--Cropland Limitations and Hazards—Continued

Soil name and map symbol	Cropland limitations and hazards
ReB:	
Rawson	Erosion hazard, wind erosion, high clay content,
RfA:	
Rimer	Seasonal high water table, frost action, wind erosion, limited available water capacity, restricted permeability, sandy layers,high clay content,
RgA:	
Rimer	Seasonal high water table, frost action, wind erosion, restricted permeability, sandy layers,
RhB:	
Rimer	Seasonal high water table, frost action, erosion hazard, wind erosion, limited available water capacity, restricted permeability, sandy layers,
Tedrow	Seasonal high water table, erosion hazard, wind erosion, limited available water capacity, restricted permeability, sandy layers,
RmA:	
Rimer	Seasonal high water table, frost action, wind erosion, sandy layers,
RoA:	
Roselms	Seasonal high water table, surface compaction, fair tilth, surface crusting, restricted permeability, clodding, very high clay content,
RrA:	
Roselms	Seasonal high water table, surface compaction, poor tilth, restricted permeability, clodding, very high clay content,
Rs:	
Ross	Occasional flooding, moderate potential for ground-water pollution,
SbB2:	
St. Clair	Part of the surface layer removed by erosion, surface compaction, fair tilth, surface crusting, erosion hazard, restricted permeability, clodding, high clay content,
SbC2:	
St. Clair	Part of the surface layer removed by erosion, surface compaction, fair tilth, surface crusting, easily eroded, erosion hazard, restricted permeability, clodding, high clay content,
ScC3:	
St. Clair	Most of the surface layer removed by erosion, surface compaction, poor tilth, easily eroded, erosion hazard, limited available water capacity, restricted permeability, clodding, high clay content,
SdB:	
Seward	Erosion hazard, wind erosion, limited available water capacity, sandy layers,high clay content,

TABLE 8.--Cropland Limitations and Hazards—Continued

Soil name and map symbol	Cropland limitations and hazards
SdC:	
Seward	Erosion hazard, wind erosion, limited available water capacity, sandy layers,high clay content,
SdD:	
Seward	Easily eroded, erosion hazard, wind erosion, limited available water capacity, sandy layers,high clay content,
SeB:	
Seward	Erosion hazard, wind erosion, sandy layers,
SeC:	
Seward	Erosion hazard, wind erosion, sandy layers,
SfA:	
Shinrock Variant	Surface compaction, high potential for ground-water pollution, frost action, surface crusting,
Sh:	
Shoals	Frequent flooding, seasonal high water table, surface compaction, moderate potential for ground-water pollution, frost action,
Sm:	
Sloan	Frequent flooding, ponding, surface compaction, moderate potential for ground-water pollution, frost action, fair tilth,
Sn:	
Sloan	Occasional flooding, seasonal high water table, moderate potential for ground-water pollution, frost action,
So:	
Sloan	Frequent flooding, seasonal high water table, surface compaction, moderate potential for ground-water pollution, frost action, fair tilth,
SpB:	
Spinks	High potential for ground-water pollution, erosion hazard, wind erosion, limited available water capacity, sandy layers,
SpC:	
Spinks	High potential for ground-water pollution, erosion hazard, wind erosion, limited available water capacity, sandy layers,
SpD:	
Spinks	High potential for ground-water pollution, erosion hazard, wind erosion, limited available water capacity, sandy layers,
TdA:	
Tedrow	Seasonal high water table, high potential for ground-water pollution, wind erosion, limited available water capacity, sandy layers,
TeA:	
Tedrow Variant	Seasonal high water table, high potential for ground-water pollution, wind erosion, limited available water capacity, sandy layers,
To:	
Toledo	Ponding, surface compaction, moderate potential for ground-water pollution, fair tilth, clodding, high clay content,

TABLE 8.--Cropland Limitations and Hazards—Continued

Soil name and map symbol	Cropland limitations and hazards
Tt:	
Toledo	Ponding, surface compaction, moderate potential for ground-water pollution, poor tilth, clodding, high clay content,
TuB2:	
Tuscola	Part of the surface layer removed by erosion, moderate potential for ground-water pollution, frost action, fair tilth, erosion hazard,
TuC2:	
Tuscola	Part of the surface layer removed by erosion, moderate potential for ground-water pollution, frost action, fair tilth, easily eroded, erosion hazard,
VaA:	
Vaughnsville	Moderate potential for ground-water pollution, frost action, high clay content,
Wa:	
Wabasha	Frequent flooding, seasonal high water table, surface compaction, moderate potential for ground-water pollution, poor tilth, frost action, clodding, high clay content,
Wc:	
Warners	Seasonal high water table, moderate potential for ground-water pollution, frost action, very high organic matter content, wind erosion,
Wf:	
Wauseon	Ponding, frost action, wind erosion, high clay content,
Wg:	
Wauseon	Ponding, frost action, wind erosion,

TABLE 9.--CROP YIELD INDEX

Refer to Crop Yield Index section in the text for more information on how this table was developed, and instructions on converting yield index numbers to estimated yields. Absence of a yield index indicates that the soil is not suited to the crop or the crop is generally not grown on the soil. See text on page 189 for additional information.)

Map symbol and soil name	Corn	Soybeans	Winter Wheat
Ad: Adrian	84	73	---
ArB: Arkport	57	55	66
ArC: Arkport	50	47	57
AsA: Aurand	100	98	100
AtA: Aurand	100	100	100
BcA: Bixler	73	78	79
Ch: Cohoctah	87	90	72
Ck: Colwood	100	100	100
Cm: Colwood	100	100	100
Cn: Colwood	100	100	100
Co: Colwood	96	94	93
DeA: Del Rey	77	86	76
DfA: Del Rey	74	82	72
DuA: Digby	80	84	81
DyA: Digby	83	88	83
DzA: Digby	84	86	83
Ee: Eel	95	86	---
FsA: Fulton	70	73	72

TABLE 9.--Crop Yield Index--Continued

Map symbol and soil name	Corn	Soybeans	Winter Wheat
FsB: Fulton	69	69	69
FuA: Fulton	68	67	67
FuB: Fulton	66	63	64
FvA: Fulton Variant	72	76	74
GaA: Galen	64	73	72
GaB: Galen	63	65	71
GbB: Galen	80	86	103
Gm: Genesee	88	86	76
Go: Gilford	92	98	86
Gr: Granby	85	90	79
HaA: Haney	69	73	79
HaB: Haney	66	67	76
HdA: Haney	72	78	83
HdB: Haney	69	73	79
HeC: Haney, Rawson	58	57	66
HkA: Haskins	77	88	76
HlA: Haskins	79	90	79
HlB: Haskins	77	86	78
HnA: Haskins	80	90	81
Ho: Hoytville	92	90	86

TABLE 9.--Crop Yield Index—Continued

Map symbol and soil name	Corn	Soybeans	Winter Wheat
Hp:	100	100	100
Hoytville---------------			
Hr:	100	100	100
Hoytville---------------			
Hs:	100	100	100
Hoytville---------------			
Hv:	91	86	83
Hoytville---------------			
Hw:	88	80	79
Hoytville Variant-------			
KeA:	100	82	100
Kibbie------------------			
KfA:	77	86	76
Kibbie------------------			
KlA:	80	92	79
Kibbie------------------			
La:	80	86	78
Latty-------------------			
Lb:	88	86	76
Latty-------------------			
Le:	88	94	86
Lenawee-----------------			
Lf:	86	88	83
Lenawee-----------------			
LwB2:	66	59	66
Lucas-------------------			
LwC2:	61	45	55
Lucas-------------------			
LxC3:	---	---	48
Lucas-------------------			
Mb:	100	100	100
Mermill-----------------			
Aurand------------------			
Mc:	95	92	83
Mermill-----------------			
Md:	89	86	76
Medway------------------			
Me:	92	90	88
Mermill-----------------			
Mf:	92	88	83
Mermill-----------------			

TABLE 9.--Crop Yield Index--Continued

Map symbol and soil name	Corn	Soybeans	Winter Wheat
Mg: Mermill	96	96	91
Mh: Millgrove	88	73	78
Mk: Millgrove	80	63	69
NaA: Nappanee	69	69	66
NaB: Nappanee	67	65	69
NtA: Nappanee	66	63	67
NtB: Nappanee	64	61	66
NtB2: Nappanee	61	53	62
OaC: Oakville	47	43	52
ObB: Oakville	51	41	62
ObC: Oakville	---	---	48
OsB: Oshtemo	57	51	64
OtB: Ottokee	63	65	67
OuB: Ottokee	69	69	69
OzB: Ottokee, Spinks	80	67	86
Pa: Paulding	73	78	66
RaB: Rawson	74	67	74
RdB: Rawson	79	78	79
ReB: Rawson	77	76	78
RfA: Rimer	64	73	66

TABLE 9.--Crop Yield Index--Continued

Map symbol and soil name	Corn	Soybeans	Winter Wheat
RgA:	69	78	79
Rimer			
RhB:	91	78	100
Rimer			
Tedrow			
RmA:	67	78	69
Rimer			
RoA:	42	55	53
Roselms			
RrA:	47	61	52
Roselms			
Rs:	89	86	95
Ross			
SbB2:	67	61	66
St. Clair			
SbC2:	61	49	57
St. Clair			
ScC3:	---	---	---
St. Clair			
SdB:	62	67	64
Seward			
SdC:	55	47	52
Seward			
SdD:	---	---	41
Seward			
SeB:	63	67	66
Seward			
SeC:	58	61	59
Seward			
SfA:	75	82	76
Shinrock Variant			
Sh:	80	86	69
Shoals			
Sm:	95	90	---
Sloan			
Sn:	88	86	78
Sloan			
So:	87	90	72
Sloan			

TABLE 9.--Crop Yield Index--Continued

Map symbol and soil name	Corn	Soybeans	Winter Wheat
SpB: Spinks	57	55	66
SpC: Spinks	50	47	57
SpD: Spinks	---	---	---
TdA: Tedrow	63	65	62
TeA: Tedrow Variant	66	71	66
To: Toledo	91	90	79
Tt: Toledo	89	86	76
TuB2: Tuscola	80	78	76
TuC2: Tuscola	74	67	69
VaA: Vaughnsville	82	80	76
Wa: Wabasha	85	82	76
Wc: Warners	66	82	76
Wf: Wauseon	93	98	84
Wg: Wauseon	91	94	78

TABLE 10.--CAPABILITY CLASSES AND SUBCLASSES

(See text on page 189 for additional information.)

Capability class	Capability subclass	Acreage
Unclassified	---	1,405
1	---	509
2	e	3,324
	w	188,345
	s	283
3	e	2,946
	w	31,346
	s	8,940
4	e	543
	w	6,097
	s	---
6	e	613
	s	746
7	e	1,440

--- Will be updated upon delivery of SSURGO certified spatial information

TABLE 11.--WOODLAND MANAGEMENT

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text on page 192 for further explanation of ratings in this table.)

Map symbol and soil name	Erosion hazard		Seedling mortality		Soil rutting hazard	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ad:						
Adrian	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
ArB:						
Arkport	Slight		Low		Moderate	
	Water erosion	0.05			Low strength	0.50
ArC:						
Arkport	Slight		Low		Moderate	
	Water erosion	0.13			Low strength	0.50
AsA:						
Aurand	Slight		High		Moderate	
	Water erosion	0.01	Wetness	1.00	Low strength	0.50
AtA:						
Aurand	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
BcA:						
Bixler	Slight		Low		Moderate	
	Water erosion	0.01			Low strength	0.50
Ca:						
Clay Pits	Not rated		Not rated		Not rated	
Ch:						
Cohoctah	Slight		High		Moderate	
	Water erosion	0.01	Wetness	1.00	Low strength	0.50
Ck:						
Colwood	Slight		High		Moderate	
	Water erosion	0.01	Wetness	1.00	Low strength	0.50
Cm:						
Colwood	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
Cn:						
Colwood	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
Co:						
Colwood	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
Cu:						
Cut And Fill Land	Not rated		Not rated		Not rated	
DeA:						
Del Rey	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00

Table 11.--Woodland Management--Continued

Map symbol and soil name	Erosion hazard: Rating class and limiting features	Value	Seedling mortality: Rating class and limiting features	Value	Soil rutting hazard: Rating class and limiting features	Value
DfA:						
Del Rey	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00
DuA:						
Digby	Slight		High		Moderate	
	Water erosion	0.01	Wetness	1.00	Low strength	0.50
DyA:						
Digby	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
DzA:						
Digby	Slight		Low		Severe	
	Water erosion	0.01			Low strength	1.00
Ee:						
Eel	Slight		Low		Severe	
	Water erosion	0.01			Low strength	1.00
FsA:						
Fulton	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00
FsB:						
Fulton	Slight		High		Severe	
	Water erosion	0.10	Wetness	1.00	Low strength	1.00
FuA:						
Fulton	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00
FuB:						
Fulton	Slight		High		Severe	
	Water erosion	0.10	Wetness	1.00	Low strength	1.00
FvA:						
Fulton Variant	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
GaA:						
Galen	Slight		Low		Moderate	
	Water erosion	0.01			Low strength	0.50
GaB:						
Galen	Slight		Low		Moderate	
	Water erosion	0.05			Low strength	0.50
GbB:						
Galen	Slight		Low		Moderate	
	Water erosion	0.05			Low strength	0.50
Gm:						
Genesee	Slight		Low		Severe	
	Water erosion	0.02			Low strength	1.00
Go:						
Gilford	Slight		High		Moderate	
	Water erosion	0.01	Wetness	1.00	Low strength	0.50

Table 11.--Woodland Management--Continued

Map symbol and soil name	Erosion hazard: Rating class and limiting features	Value	Seedling mortality: Rating class and limiting features	Value	Soil rutting hazard: Rating class and limiting features	Value
Gr:						
Granby	Slight		High		Moderate	
	Water erosion	0.01	Wetness	1.00	Low strength	0.50
Gv:						
Gravel Pits			Not rated		Not rated	
HaA:						
Haney	Slight		Low		Moderate	
	Water erosion	0.01			Low strength	0.50
HaB:						
Haney	Slight		Low		Moderate	
	Water erosion	0.05			Low strength	0.50
HdA:						
Haney	Slight		Low		Severe	
	Water erosion	0.01			Low strength	1.00
HdB:						
Haney	Slight		Low		Severe	
	Water erosion	0.05			Low strength	1.00
HeC:						
Haney	Slight		Low		Severe	
	Water erosion	0.13			Low strength	1.00
Rawson	Slight		Low		Severe	
	Water erosion	0.13			Low strength	1.00
HkA:						
Haskins	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
HlA:						
Haskins	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00
HlB:						
Haskins	Slight		High		Severe	
	Water erosion	0.10	Wetness	1.00	Low strength	1.00
HnA:						
Haskins	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
Ho:						
Hoytville	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
Hp:						
Hoytville	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
Hr:						
Hoytville	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
Hs:						
Hoytville	Slight		High		Severe	

Table 11.--Woodland Management--Continued

Map symbol and soil name	Erosion hazard: Rating class and limiting features	Erosion hazard: Value	Seedling mortality: Rating class and limiting features	Seedling mortality: Value	Soil rutting hazard: Rating class and limiting features	Soil rutting hazard: Value
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
Hv:						
Hoytville	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
Hw:						
Hoytville Variant	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
KeA:						
Kibbie	Slight		High		Moderate	
	Water erosion	0.01	Wetness	1.00	Low strength	0.50
KfA:						
Kibbie	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
KlA:						
Kibbie	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
La:						
Latty	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
Lb:						
Latty	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
Le:						
Lenawee	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
Lf:						
Lenawee	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
LwB2:						
Lucas	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
LwC2:						
Lucas	Slight		Low		Severe	
	Water erosion	0.22			Low strength	1.00
LxC3:						
Lucas	Slight		Low		Severe	
	Water erosion	0.13			Low strength	1.00
LxE3:						
Lucas	Moderate		Low		Severe	
	Water erosion	0.49			Low strength	1.00
Mb:						
Mermill	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
Aurand	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00

Table 11.--Woodland Management--Continued

Map symbol and soil name	Erosion hazard: Rating class and limiting features	Value	Seedling mortality: Rating class and limiting features	Value	Soil rutting hazard: Rating class and limiting features	Value
Mc:						
Mermill	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00
Md:						
Medway	Slight		Moderate		Severe	
	Water erosion	0.01	Wetness	0.50	Low strength	1.00
Me:						
Mermill	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
Mf:						
Mermill	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
Mg:						
Mermill	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
Mh:						
Millgrove	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
Mk:						
Millgrove	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
NaA:						
Nappanee	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00
NaB:						
Nappanee	Slight		High		Severe	
	Water erosion	0.10	Wetness	1.00	Low strength	1.00
NtA:						
Nappanee	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00
NtB:						
Nappanee	Slight		High		Severe	
	Water erosion	0.10	Wetness	1.00	Low strength	1.00
NtB2:						
Nappanee	Slight		High		Severe	
	Water erosion	0.10	Wetness	1.00	Low strength	1.00
OaC:						
Oakville	Slight		Low		Moderate	
	Water erosion	0.10			Low strength	0.50
ObB:						
Oakville	Slight		Low		Moderate	
	Water erosion	0.05			Low strength	0.50
ObC:						
Oakville	Slight		Low		Moderate	
	Water erosion	0.13			Low strength	0.50

Table 11.--Woodland Management--Continued

Map symbol and soil name	Erosion hazard: Rating class and limiting features	Erosion hazard: Value	Seedling mortality: Rating class and limiting features	Seedling mortality: Value	Soil rutting hazard: Rating class and limiting features	Soil rutting hazard: Value
OsB:						
Oshtemo	Slight		Low		Moderate	
	Water erosion	0.05			Low strength	0.50
OtB:						
Ottokee	Slight		Low		Moderate	
	Water erosion	0.03			Low strength	0.50
OuB:						
Ottokee	Slight		Low		Moderate	
	Water erosion	0.03			Low strength	0.50
OzB:						
Ottokee	Slight		Low		Moderate	
	Water erosion	0.03			Low strength	0.50
Spinks	Slight		Low		Moderate	
	Water erosion	0.03			Low strength	0.50
Pa:						
Paulding	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
Pt:						
Pits, Quarry	Not rated		Not rated		Not rated	
RaB:						
Rawson	Slight		Low		Moderate	
	Water erosion	0.05			Low strength	0.50
RdB:						
Rawson	Slight		Low		Severe	
	Water erosion	0.05			Low strength	1.00
ReB:						
Rawson	Slight		Low		Moderate	
	Water erosion	0.05			Low strength	0.50
RfA:						
Rimer	Slight		High		Moderate	
	Water erosion	0.01	Wetness	1.00	Low strength	0.50
RgA:						
Rimer	Slight		Low		Moderate	
	Water erosion	0.01			Low strength	0.50
RhB:						
Rimer	Slight		High		Moderate	
	Water erosion	0.03	Wetness	1.00	Low strength	0.50
Tedrow	Slight		High		Moderate	
	Water erosion	0.03	Wetness	1.00	Low strength	0.50
RmA:						
Rimer	Slight		High		Moderate	
	Water erosion	0.01	Wetness	1.00	Low strength	0.50
RoA:						
Roselms	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00

Table 11.--Woodland Management--Continued

Map symbol and soil name	Erosion hazard: Rating class and limiting features	Value	Seedling mortality: Rating class and limiting features	Value	Soil rutting hazard: Rating class and limiting features	Value
RrA:						
Roselms	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
			Carbonate content	0.50		
Rs:						
Ross	Slight		Low		Severe	
	Water erosion	0.01			Low strength	1.00
SaE3:						
St. Clair	Moderate		Low		Severe	
	Water erosion	0.46			Low strength	1.00
SbB2:						
St. Clair	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
SbC2:						
St. Clair	Slight		Low		Severe	
	Water erosion	0.22			Low strength	1.00
SbD2:						
St. Clair	Moderate		Low		Severe	
	Water erosion	0.34			Low strength	1.00
SbE2:						
St. Clair	Moderate		Low		Severe	
	Water erosion	0.49			Low strength	1.00
ScC3:						
St. Clair	Slight		Low		Severe	
	Water erosion	0.13			Low strength	1.00
ScD3:						
St. Clair	Moderate		Low		Severe	
	Water erosion	0.25			Low strength	1.00
ScE3:						
St. Clair	Moderate		Low		Severe	
	Water erosion	0.37			Low strength	1.00
ScF3:						
St. Clair	Moderate		Low		Severe	
	Water erosion	0.60			Low strength	1.00
SdB:						
Seward	Slight		Low		Moderate	
	Water erosion	0.05			Low strength	0.50
SdC:						
Seward	Slight		Low		Moderate	
	Water erosion	0.13			Low strength	0.50
SdD:						
Seward	Moderate		Low		Moderate	
	Water erosion	0.25			Low strength	0.50
SeB:						
Seward	Slight		Low		Moderate	
	Water erosion	0.05			Low strength	0.50

Table 11.--Woodland Management--Continued

Map symbol and soil name	Erosion hazard: Rating class and limiting features	Erosion hazard: Value	Seedling mortality: Rating class and limiting features	Seedling mortality: Value	Soil rutting hazard: Rating class and limiting features	Soil rutting hazard: Value
SeC:						
Seward	Slight		Low		Moderate	
	Water erosion	0.13			Low strength	0.50
SfA:						
Shinrock Variant	Slight		Low		Severe	
	Water erosion	0.02			Low strength	1.00
Sh:						
Shoals	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00
Sm:						
Sloan	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
Sn:						
Sloan	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
So:						
Sloan	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
SpB:						
Spinks	Slight		Low		Moderate	
	Water erosion	0.05			Low strength	0.50
SpC:						
Spinks	Slight		Low		Moderate	
	Water erosion	0.13			Low strength	0.50
SpD:						
Spinks	Moderate		Low		Moderate	
	Water erosion	0.25			Low strength	0.50
TdA:						
Tedrow	Slight		High		Moderate	
	Water erosion	0.01	Wetness	1.00	Low strength	0.50
TeA:						
Tedrow Variant	Slight		High		Moderate	
	Water erosion	0.01	Wetness	1.00	Low strength	0.50
To:						
Toledo	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
Tt:						
Toledo	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
TuB2:						
Tuscola	Slight		Low		Severe	
	Water erosion	0.05			Low strength	1.00
TuC2:						
Tuscola	Slight		Low		Severe	
	Water erosion	0.13			Low strength	1.00

Table 11.--Woodland Management--Continued

Map symbol and soil name	Erosion hazard: Rating class and limiting features	Value	Seedling mortality: Rating class and limiting features	Value	Soil rutting hazard: Rating class and limiting features	Value
Ud:						
Udorthents	Not rated		Not rated		Not rated	
Ur:						
Urban Land	Not rated		Not rated		Not rated	
VaA:						
Vaughnsville	Slight		Low		Severe	
	Water erosion	0.01			Low strength	1.00
W:						
Water	Not rated		Not rated		Not rated	
Wa:						
Wabasha	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
Wc:						
Warners	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
			Carbonate content	0.50		
			Soil reaction	0.50		
Wf:						
Wauseon	Slight		High		Moderate	
	Water erosion	0.01	Wetness	1.00	Low strength	0.50
Wg:						
Wauseon	Slight		High		Moderate	
	Water erosion	0.01	Wetness	1.00	Low strength	0.50

TABLE 12.--WOODLAND PRODUCTIVITY

(See text on page 193 for additional information.)

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
Ad:				
Adrian	black willow	---	---	---
	quaking aspen	56	57	
	red maple	51	29	
	silver maple	76	29	
	white ash	51	29	
ArB:				
Arkport	eastern white pine	85	143	Norway spruce, eastern white pine, red pine
	red pine	85	114	
	sugar maple	70	43	
ArC:				
Arkport	eastern white pine	85	143	Norway spruce, eastern white pine, red pine
	red pine	85	114	
	sugar maple	70	43	
AsA:				
Aurand	northern red oak	80	57	American sycamore, black locust, bur oak, green ash, northern red oak, sugar maple, tuliptree, white ash, white oak
	pin oak	---	---	
	sugar maple	---	---	
	tuliptree	---	---	
	white ash	---	---	
	white oak	75	57	
AtA:				
Aurand	northern red oak	80	57	American sycamore, black locust, bur oak, green ash, northern red oak, sugar maple, tuliptree, white ash, white oak
	pin oak	---	---	
	sugar maple	---	---	
	tuliptree	---	---	
	white ash	---	---	
	white oak	75	57	
BcA:				
Bixler	northern red oak	80	57	eastern white pine, white ash, yellow poplar, red pine, northern red oak, white oak
	white oak	75	---	
	black walnut	---	---	
	black cherry	---	---	
	sugar maple	---	---	
	white ash	---	---	
	yellow poplar	---	---	
Ca:				
Clay Pits	---	---	---	---
Ch:				
Cohoctah	black cherry	---	0	American sycamore, eastern cottonwood, green ash, pin oak, red maple, swamp white oak
	eastern cottonwood	---	0	
	green ash	70	72	
	pin oak	---	0	
	red maple	72	43	
	silver maple	95	43	
	swamp white oak	---	0	

Table 12.--Woodland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
Ck:				
Colwood	pin oak	90	72	American sycamore, Norway spruce, Shumard's oak, bur oak, eastern cottonwood, green ash, pin oak, red maple, river birch, silver maple, swamp white oak, sweetgum, white ash
	red maple	---	---	
	swamp white oak	90	72	
	white ash	---	---	
Cm:				
Colwood	pin oak	90	72	American sycamore, Norway spruce, Shumard's oak, bur oak, eastern cottonwood, green ash, pin oak, red maple, river birch, silver maple, swamp white oak, sweetgum, white ash
	red maple	---	---	
	swamp white oak	90	72	
	white ash	---	---	
Cn:				
Colwood	pin oak	90	72	Norway spruce, white ash
	red maple	---	---	
	swamp white oak	90	72	
	white ash	---	---	
Co:				
Colwood	pin oak	90	72	Norway spruce, white ash
	red maple	---	---	
	swamp white oak	90	72	
	white ash	---	---	
Cu:				
Cut And Fill Land	---	---	---	---
DeA:				
Del Rey	bur oak	---	---	Austrian pine, eastern redcedar, green ash, pin oak, red maple
	green ash	---	---	
	northern red oak	70	57	
	white oak	70	57	
DfA:				
Del Rey	bur oak	---	---	Austrian pine, eastern redcedar, green ash, pin oak, red maple
	green ash	---	---	
	northern red oak	70	57	
	white oak	70	57	

Table 12.--Woodland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
DuA:				
Digby	black cherry	---	---	American sycamore, black cherry, black locust, eastern white pine, green ash, northern red oak, red pine, tuliptree, white ash, white oak
	northern red oak	80	57	
	pin oak	---	---	
	sugar maple	---	---	
	tuliptree	---	---	
	white ash	---	---	
	white oak	75	57	
DyA:				
Digby	black cherry	---	---	American sycamore, black cherry, black locust, eastern white pine, green ash, northern red oak, red pine, tuliptree, white ash, white oak
	northern red oak	80	57	
	pin oak	---	---	
	sugar maple	---	---	
	tuliptree	---	---	
	white ash	---	---	
	white oak	75	57	
DzA:				
Digby	northern red oak	80	57	white ash, red maple, eastern white pine, yellow poplar
	white oak	75	57	
	white ash	---	---	
	pin oak	---	---	
Ee:				
Eel	black cherry	---	---	black cherry, black locust, bur oak, green ash, northern red oak, tuliptree, white ash, white oak
	black walnut	---	---	
	northern red oak	---	---	
	tuliptree	100	114	
	white ash	---	---	
FsA:				
Fulton	American beech	---	---	American sycamore, Austrian pine, black oak, eastern cottonwood, green ash, pin oak, red maple, tuliptree
	black cherry	---	---	
	pin oak	80	57	
	red maple	---	---	
	slippery elm	---	---	
	white ash	---	---	
	white oak	---	---	
FsB:				
Fulton	American beech	---	---	American sycamore, Austrian pine, black oak, eastern cottonwood, green ash, pin oak, red maple, tuliptree
	black cherry	---	---	
	pin oak	80	57	
	red maple	---	---	
	slippery elm	---	---	
	white ash	---	---	
	white oak	---	---	

Table 12.--Woodland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
FuA:				
Fulton	American beech	---	---	American sycamore, Austrian pine, black oak, eastern cottonwood, green ash, pin oak, red maple, tuliptree
	black cherry	---	---	
	pin oak	80	57	
	red maple	---	---	
	slippery elm	---	---	
	white ash	---	---	
	white oak	---	---	
FuB:				
Fulton	American beech	---	---	American sycamore, Austrian pine, black oak, eastern cottonwood, green ash, pin oak, red maple, tuliptree
	black cherry	---	---	
	pin oak	80	57	
	red maple	---	---	
	slippery elm	---	---	
	white ash	---	---	
	white oak	---	---	
FvA:				
Fulton Variant	black cherry	---	---	American sycamore, Austrian pine, black oak, eastern cottonwood, green ash, pin oak, red maple, tuliptree
	red maple	---	---	
	slippery elm	---	---	
	white ash	---	---	
	white oak	65	43	
GaA:				
Galen	eastern white pine	85	143	black walnut, eastern white pine, northern red oak, red pine, tuliptree, white ash, white oak
	sugar maple	70	43	
	white ash	84	57	
GaB:				
Galen	eastern white pine	85	143	black walnut, eastern white pine, northern red oak, red pine, tuliptree, white ash, white oak
	sugar maple	70	43	
	white ash	84	57	
GbB:				
Galen	eastern white pine	85	143	eastern white pine, red pine, yellow poplar, black walnut, white ash, white oak, northern red oak
	sugar maple	---	43	
	white ash	---	57	
Gm:				
Genesee	tuliptree	100	114	black locust, black walnut, eastern white pine, tuliptree

Table 12.--Woodland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
Go:				
Gilford	bigtooth aspen	70	86	European larch, eastern white pine, white ash, white spruce
	eastern white pine	55	100	
	pin oak	70	57	
	red maple	60	43	
Gr:				
Granby	eastern white pine	75	172	European larch, black spruce, eastern white pine
	pin oak	70	57	
	quaking aspen	70	86	
Gv:				
Gravel Pits	---	---	---	---
HaA:				
Haney	black cherry	---	---	black walnut, eastern white pine, northern red oak, red pine, tuliptree, white ash, white oak
	black walnut	---	---	
	northern red oak	80	57	
	sugar maple	---	---	
	tuliptree	---	---	
	white ash	---	---	
	white oak	75	57	
HaB:				
Haney	black cherry	---	---	black walnut, eastern white pine, northern red oak, red pine, tuliptree, white ash, white oak
	black walnut	---	---	
	northern red oak	80	57	
	sugar maple	---	---	
	tuliptree	---	---	
	white ash	---	---	
	white oak	75	57	
HdA:				
Haney	black cherry	---	---	black walnut, eastern white pine, northern red oak, red pine, tuliptree, white ash, white oak
	black walnut	---	---	
	northern red oak	80	57	
	sugar maple	---	---	
	tuliptree	---	---	
	white ash	---	---	
	white oak	75	57	
HdB:				
Haney	black cherry	---	---	black walnut, eastern white pine, northern red oak, red pine, tuliptree, white ash, white oak
	black walnut	---	---	
	northern red oak	80	57	
	sugar maple	---	---	
	tuliptree	---	---	
	white ash	---	---	
	white oak	75	57	
HeC:				
Haney	black cherry	---	---	black walnut, eastern white pine, northern red oak, red pine, tuliptree, white ash, white oak
	black walnut	---	---	
	northern red oak	80	57	
	sugar maple	---	---	
	tuliptree	---	---	
	white ash	---	---	
	white oak	75	57	

Table 12.--Woodland Productivity--Continued

Map symbol and soil name	Potential productivity			Trees to manage
	Common trees	Site index	Volume of wood fiber	
			cu ft/ac	
Rawson	black cherry	---	---	American sycamore, black cherry, black locust, eastern white pine, green ash, northern red oak, red pine, tuliptree, white ash, white oak
	northern red oak	80	57	
	sugar maple	---	---	
	tuliptree	---	---	
	white ash	---	---	
	white oak	75	57	
HkA:				
Haskins	black cherry	---	---	American sycamore, black cherry, black locust, eastern white pine, green ash, northern red oak, red pine, tuliptree, white ash, white oak
	northern red oak	80	57	
	pin oak	90	72	
	sugar maple	---	---	
	tuliptree	---	---	
	white ash	---	---	
	white oak	75	57	
HlA:				
Haskins	black cherry	---	---	American sycamore, black cherry, black locust, eastern white pine, green ash, northern red oak, red pine, tuliptree, white ash, white oak
	northern red oak	80	57	
	pin oak	90	72	
	sugar maple	---	---	
	tuliptree	---	---	
	white ash	---	---	
	white oak	75	57	
HlB:				
Haskins	black cherry	---	---	American sycamore, black cherry, black locust, eastern white pine, green ash, northern red oak, red pine, tuliptree, white ash, white oak
	northern red oak	80	57	
	pin oak	90	72	
	sugar maple	---	---	
	tuliptree	---	---	
	white ash	---	---	
	white oak	75	57	
HnA:				
Haskins	black cherry	---	---	American sycamore, black cherry, black locust, eastern white pine, green ash, northern red oak, red pine, tuliptree, white ash, white oak
	northern red oak	80	57	
	pin oak	90	72	
	sugar maple	---	---	
	tuliptree	---	---	
	white ash	---	---	
	white oak	75	57	

Table 12.--Woodland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
Ho:				
Hoytville	black cherry	---	---	American sycamore, eastern cottonwood, green ash, pin oak, red maple, silver maple, swamp white oak, sweetgum
	eastern cottonwood	---	---	
	green ash	---	---	
	northern red oak	72	57	
	pin oak	76	57	
	red maple	---	---	
	white ash	77	43	
Hp:				
Hoytville	black cherry	---	---	American sycamore, Norway spruce, eastern cottonwood, green ash, pin oak, red maple, silver maple, swamp white oak, sweetgum, white ash
	eastern cottonwood	---	---	
	green ash	---	---	
	northern red oak	72	57	
	pin oak	76	57	
	red maple	---	---	
	white ash	77	43	
Hr:				
Hoytville	American sycamore	---	---	American sycamore, Norway spruce, baldcypress, eastern cottonwood, green ash, pin oak, red maple, river birch, silver maple, swamp white oak, sweetgum
	eastern cottonwood	---	---	
	green ash	---	---	
	pin oak	76	57	
	red maple	---	---	
	swamp white oak	---	---	
	white ash	77	43	
Hs:				
Hoytville	American sycamore	---	---	American sycamore, Norway spruce, baldcypress, eastern cottonwood, green ash, pin oak, red maple, river birch, silver maple, swamp white oak, sweetgum
	eastern cottonwood	---	---	
	green ash	---	---	
	pin oak	76	57	
	red maple	---	---	
	swamp white oak	---	---	
	white ash	77	43	
Hv:				
Hoytville	black cherry	---	---	American sycamore, eastern cottonwood, green ash, pin oak, red maple, silver maple, swamp white oak, sweetgum
	eastern cottonwood	---	---	
	green ash	---	---	
	northern red oak	72	57	
	pin oak	76	57	
	red maple	---	---	
	white ash	77	43	

Table 12.--Woodland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
Hw:				
Hoytville Variant	American sycamore	---	---	American sycamore, baldcypress, eastern cottonwood, green ash, pin oak, red maple, silver maple, swamp white oak, sweetgum
	black willow	---	---	
	eastern cottonwood	---	---	
	green ash	---	---	
	red maple	---	---	
	swamp white oak	---	---	
	pin oak	60	43	
KeA:				
Kibbie	American basswood	---	---	American sycamore, black locust, bur oak, green ash, northern red oak, sugar maple, white ash, white oak
	northern red oak	---	---	
	pin oak	90	72	
	red maple	---	---	
	white ash	---	---	
KfA:				
Kibbie	eastern cottonwood	---	---	Norway spruce, eastern white pine, tuliptree, white ash
	northern red oak	---	---	
	pin oak	90	72	
	white ash	---	---	
KlA:				
Kibbie	eastern cottonwood	---	---	Norway spruce, eastern white pine, tuliptree, white ash
	northern red oak	---	---	
	pin oak	90	72	
	white ash	---	---	
La:				
Latty	black cherry	---	---	American sycamore, baldcypress, eastern cottonwood, green ash, pin oak, red maple, swamp white oak, sweetgum
	eastern cottonwood	---	---	
	green ash	---	---	
	pin oak	70	57	
	red maple	---	---	
	swamp white oak	70	---	
Lb:				
Latty	swamp white oak	70	---	green ash, eastern cottonwood, red maple, pin oak, American sycamore, swamp white oak, sweetgum
	pin oak	70	57	
	red maple	---	---	
	green ash	---	---	
	black cherry	---	---	
	eastern cottonwood	---	---	
Le:				
Lenawee	black cherry	---	---	American sycamore, baldcypress, eastern cottonwood, green ash, pin oak, red maple, swamp white oak, sweetgum
	eastern cottonwood	---	---	
	green ash	---	---	
	pin oak	85	72	
	red maple	---	---	
	swamp white oak	---	---	

Table 12.--Woodland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
Lf:				
Lenawee	black cherry	---	---	American sycamore, baldcypress, eastern cottonwood, green ash, pin oak, red maple, swamp white oak, sweetgum
	eastern cottonwood	---	---	
	green ash	---	---	
	pin oak	85	72	
	red maple	---	---	
	swamp white oak	---	---	
LwB2:				
Lucas	black cherry	---	---	American sycamore, Austrian pine, black oak, eastern cottonwood, green ash, pin oak, red maple, tuliptree
	northern red oak	70	57	
	red maple	---	---	
	slippery elm	---	---	
	white ash	---	---	
	white oak	---	---	
LwC2:				
Lucas	black cherry	---	---	American sycamore, Austrian pine, black oak, eastern cottonwood, green ash, pin oak, red maple, tuliptree
	northern red oak	70	57	
	red maple	---	---	
	slippery elm	---	---	
	white ash	---	---	
	white oak	---	---	
LxC3:				
Lucas	black cherry	---	---	American sycamore, Austrian pine, black oak, eastern cottonwood, green ash, pin oak, red maple, tuliptree
	northern red oak	70	57	
	red maple	---	---	
	slippery elm	---	---	
	white ash	---	---	
	white oak	---	---	
LxE3:				
Lucas	black cherry	---	---	American sycamore, Austrian pine, black oak, eastern cottonwood, green ash, pin oak, red maple, tuliptree
	northern red oak	70	57	
	red maple	---	---	
	slippery elm	---	---	
	white ash	---	---	
	white oak	---	---	
Mb:				
Mermill	eastern cottonwood	---	---	American sycamore, Norway spruce, baldcypress, bur oak, eastern cottonwood, green ash, pin oak, red maple, river birch, silver maple, swamp white oak, sweetgum, white ash
	green ash	---	---	
	pin oak	90	72	
	red maple	---	---	
	swamp white oak	90	72	

Table 12.--Woodland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
Aurand	northern red oak	80	57	American sycamore, black oak, bur oak, green ash, northern red oak, pin oak, sugar maple, tuliptree, white ash, white oak
	pin oak	---	---	
	sugar maple	---	---	
	tuliptree	---	---	
	white ash	---	---	
	white oak	75	57	
Mc:				
Mermill	eastern cottonwood	---	---	American sycamore, baldcypress, eastern cottonwood, green ash, pin oak, red maple, swamp white oak, sweetgum
	green ash	---	---	
	pin oak	90	72	
	red maple	---	---	
	swamp white oak	90	72	
Md:				
Medway	black cherry	---	---	black walnut, eastern white pine, northern red oak, red pine, tuliptree, white ash, white oak
	black walnut	---	---	
	northern red oak	86	72	
	sugar maple	---	---	
	tuliptree	96	100	
	white ash	---	---	
	white oak	---	---	
Me:				
Mermill	eastern cottonwood	---	---	American sycamore, baldcypress, eastern cottonwood, green ash, pin oak, red maple, swamp white oak, sweetgum
	green ash	---	---	
	pin oak	90	72	
	red maple	---	---	
	swamp white oak	90	72	
Mf:				
Mermill	eastern cottonwood	---	---	American sycamore, baldcypress, eastern cottonwood, green ash, pin oak, red maple, swamp white oak, sweetgum
	green ash	---	---	
	pin oak	90	72	
	red maple	---	---	
	swamp white oak	90	72	
Mg:				
Mermill	eastern cottonwood	---	---	American sycamore, baldcypress, eastern cottonwood, green ash, pin oak, red maple, swamp white oak, sweetgum
	green ash	---	---	
	pin oak	90	72	
	red maple	---	---	
	swamp white oak	90	72	

Table 12.--Woodland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
Mh:				
Millgrove	eastern cottonwood	---	---	American sycamore, eastern cottonwood, green ash, pin oak, red maple, silver maple, swamp white oak, sweetgum
	green ash	---	---	
	pin oak	86	72	
	red maple	---	---	
	swamp white oak	85	72	
Mk:				
Millgrove	eastern cottonwood	---	---	American sycamore, eastern cottonwood, green ash, pin oak, red maple, silver maple, swamp white oak, sweetgum
	green ash	---	---	
	pin oak	86	72	
	red maple	---	---	
	swamp white oak	85	72	
NaA:				
Nappanee	American sycamore	---	---	American sycamore, baldcypress, eastern white pine, red maple, tuliptree, white ash
	pin oak	85	72	
	sweetgum	80	86	
	white oak	75	72	
NaB:				
Nappanee	American sycamore	---	---	American sycamore, baldcypress, eastern white pine, red maple, tuliptree, white ash
	pin oak	85	72	
	sweetgum	80	86	
	white oak	75	72	
NtA:				
Nappanee	American sycamore	---	---	American sycamore, baldcypress, eastern white pine, red maple, tuliptree, white ash
	pin oak	85	72	
	sweetgum	80	86	
	white oak	75	72	
NtB:				
Nappanee	American sycamore	---	---	American sycamore, baldcypress, eastern white pine, red maple, tuliptree, white ash
	pin oak	85	72	
	sweetgum	80	86	
	white oak	75	72	
NtB2:				
Nappanee	American sycamore	---	---	American sycamore, baldcypress, eastern white pine, red maple, tuliptree, white ash
	pin oak	85	72	
	sweetgum	80	86	
	white oak	75	72	

Table 12.--Woodland Productivity--Continued

Map symbol and soil name	Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
OaC:				
Oakville	eastern white pine	85	200	eastern white pine, jack pine, red pine
	jack pine	68	100	
	red pine	78	143	
	white oak	70	57	
ObB:				
Oakville	white oak	70	57	eastern white pine, red pine, jack pine, white ash
	red pine	78	143	
	jack pine	68	100	
ObC:				
Oakville	white oak	70	57	eastern white pine, red pine
	red pine	78	143	
	eastern white pine	85	200	
	jack pine	68	100	
OsB:				
Oshtemo	eastern white pine	85	200	eastern white pine, jack pine, red pine
	jack pine	68	100	
	red pine	78	143	
	white oak	70	57	
OtB:				
Ottokee	bur oak	---	---	black oak, eastern white pine, imperial Carolina poplar, red pine
	green ash	---	---	
	northern red oak	70	57	
	red maple	---	---	
	slippery elm	---	---	
	white ash	---	---	
	white oak	65	43	
OuB:				
Ottokee	northern red oak	70	---	green ash, red pine, eastern white pine
	white oak	65	---	
	red maple	---	---	
	black oak	---	---	
	bur oak	---	---	
	quaking aspen	---	---	
	green ash	---	---	
	slippery elm	---	---	
OzB:				
Ottokee	bur oak	---	---	black cherry, black oak, bur oak, chinkapin oak, eastern white pine, white ash, white oak
	green ash	---	---	
	northern red oak	70	57	
	red maple	---	---	
	white ash	---	---	
	white oak	65	43	
Spinks	black cherry	---	---	black cherry, black oak, bur oak, chinkapin oak, eastern white pine, white ash, white oak
	black oak	---	---	
	northern red oak	70	57	
	sugar maple	---	---	
	white ash	---	---	
	white oak	66	43	

Table 12.--Woodland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
Pa:				
Paulding	black cherry	---	---	American sycamore, eastern cottonwood, green ash, pin oak, red maple, silver maple, swamp white oak, sweetgum
	eastern cottonwood	---	---	
	green ash	---	---	
	pin oak	76	57	
	red maple	---	---	
	swamp white oak	65	43	
Pt:				
Pits, Quarry	---	---	---	---
RaB:				
Rawson	black cherry	---	---	American sycamore, black cherry, black locust, eastern white pine, green ash, northern red oak, red pine, tuliptree, white ash, white oak
	northern red oak	80	57	
	sugar maple	---	---	
	tuliptree	---	---	
	white ash	---	---	
	white oak	75	57	
RdB:				
Rawson	black cherry	---	---	American sycamore, black cherry, black locust, eastern white pine, green ash, northern red oak, red pine, tuliptree, white ash, white oak
	northern red oak	80	57	
	sugar maple	---	---	
	tuliptree	---	---	
	white ash	---	---	
	white oak	75	57	
ReB:				
Rawson	black cherry	---	---	American sycamore, black cherry, black locust, eastern white pine, green ash, northern red oak, red pine, tuliptree, white ash, white oak
	northern red oak	80	57	
	sugar maple	---	---	
	tuliptree	---	---	
	white ash	---	---	
	white oak	75	57	
RfA:				
Rimer	black oak	---	---	black oak, jack pine, northern red oak, red pine, tuliptree, white ash
	bur oak	---	---	
	green ash	---	---	
	northern red oak	80	57	
	quaking aspen	---	---	
	red maple	---	---	
	slippery elm	---	---	
	white oak	75	57	

Table 12.--Woodland Productivity--Continued

Map symbol and soil name	Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
RgA:				
Rimer	northern red oak	80	57	eastern white pine, red pine, green ash
	white oak	75	57	
	red maple	---	---	
	blackgum	---	---	
	bur oak	---	---	
	quaking aspen	---	---	
	green ash	---	---	
	slippery elm	---	---	
RhB:				
Rimer	black oak	---	---	black oak, bur oak, green ash, northern red oak, tuliptree, white ash, white oak
	bur oak	---	---	
	green ash	---	---	
	northern red oak	80	57	
	red maple	---	---	
	white oak	75	57	
Tedrow	black oak	---	---	black oak, bur oak, green ash, northern red oak, tuliptree, white ash, white oak
	bur oak	75	57	
	green ash	---	---	
	northern red oak	---	---	
	red maple	---	---	
RmA:				
Rimer	black oak	---	---	black oak, jack pine, northern red oak, red pine, tuliptree, white ash
	bur oak	---	---	
	green ash	---	---	
	northern red oak	80	57	
	quaking aspen	---	---	
	red maple	---	---	
	slippery elm	---	---	
	white oak	75	57	
RoA:				
Roselms	black cherry	---	---	American sycamore, Austrian pine, black oak, eastern cottonwood, green ash, pin oak, red maple, tuliptree
	red maple	---	---	
	slippery elm	---	---	
	white ash	---	---	
	white oak	60	43	
RrA:				
Roselms	swamp white oak	60	---	red maple, white ash
	red maple	---	---	
	white ash	---	---	
Rs:				
Ross	black cherry	---	---	Norway spruce, black walnut, eastern white pine, tuliptree, white ash
	black walnut	---	---	
	northern red oak	86	72	
	sugar maple	85	57	
	tuliptree	96	100	
	white ash	---	---	
	white oak	---	---	

Table 12.--Woodland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
SaE3:				
St. Clair	northern red oak	66	43	eastern white pine, yellow poplar, pin oak, Austrian pine, green ash, red pine
	white oak	62	43	
	white ash	---	---	
	sugar maple	---	---	
SbB2:				
St. Clair	northern red oak	66	43	eastern white pine, tuliptree
	sugar maple	---	---	
	white ash	---	---	
	white oak	62	43	
SbC2:				
St. Clair	northern red oak	66	43	eastern white pine, tuliptree
	sugar maple	---	---	
	white ash	---	---	
	white oak	62	43	
SbD2:				
St. Clair	northern red oak	66	43	American sycamore, Austrian pine, bur oak, eastern cottonwood, eastern white pine, green ash, pin oak, red maple, swamp white oak, tuliptree, white ash
	sugar maple	---	---	
	white ash	---	---	
	white oak	62	43	
SbE2:				
St. Clair	northern red oak	66	43	American sycamore, Austrian pine, bur oak, eastern cottonwood, eastern white pine, green ash, pin oak, red maple, swamp white oak, tuliptree, white ash
	sugar maple	---	---	
	white ash	---	---	
	white oak	62	43	
ScC3:				
St. Clair	northern red oak	66	43	eastern white pine, tuliptree
	sugar maple	---	---	
	white ash	---	---	
	white oak	62	43	
ScD3:				
St. Clair	northern red oak	66	43	eastern white pine, tuliptree
	sugar maple	---	---	
	white ash	---	---	
	white oak	62	43	
ScE3:				
St. Clair	northern red oak	66	43	eastern white pine, tuliptree
	sugar maple	---	---	
	white ash	---	---	
	white oak	62	43	

Table 12.--Woodland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
ScF3:				
St. Clair	northern red oak	66	43	eastern white pine, tuliptree
	sugar maple	---	---	
	white ash	---	---	
	white oak	62	43	
SdB:				
Seward	black oak	---	---	black oak, black walnut, jack pine, northern red oak, red pine, tuliptree, white ash
	bur oak	---	---	
	green ash	---	---	
	northern red oak	80	57	
	quaking aspen	---	---	
	red maple	---	---	
	slippery elm	---	---	
	tuliptree	95	100	
SdC:				
Seward	black oak	---	---	black oak, black walnut, jack pine, northern red oak, red pine, tuliptree, white ash
	bur oak	---	---	
	green ash	---	---	
	northern red oak	80	57	
	quaking aspen	---	---	
	red maple	---	---	
	slippery elm	---	---	
	tuliptree	95	100	
SdD:				
Seward	black oak	---	---	black oak, black walnut, jack pine, northern red oak, red pine, tuliptree, white ash
	bur oak	---	---	
	green ash	---	---	
	northern red oak	80	57	
	quaking aspen	---	---	
	red maple	---	---	
	slippery elm	---	---	
	tuliptree	95	100	
SeB:				
Seward	black oak	---	---	black oak, black walnut, jack pine, northern red oak, red pine, tuliptree, white ash
	bur oak	---	---	
	green ash	---	---	
	northern red oak	80	57	
	quaking aspen	---	---	
	red maple	---	---	
	slippery elm	---	---	
	tuliptree	95	100	
SeC:				
Seward	black oak	---	---	black oak, black walnut, jack pine, northern red oak, red pine, tuliptree, white ash
	bur oak	---	---	
	green ash	---	---	
	northern red oak	80	57	
	quaking aspen	---	---	
	red maple	---	---	
	slippery elm	---	---	
	tuliptree	95	100	

Table 12.--Woodland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
SfA:				
Shinrock Variant	black cherry	---	---	American sycamore, Austrian pine, black oak, eastern cottonwood, green ash, pin oak, red maple, tuliptree
	northern red oak	80	57	
	red maple	---	---	
	slippery elm	---	---	
	white ash	---	---	
	white oak	---	---	
Sh:				
Shoals	Virginia pine	90	129	pin oak, red maple, swamp chestnut oak, sweetgum, tuliptree
	eastern cottonwood	---	---	
	pin oak	90	72	
	sweetgum	86	100	
	tuliptree	90	86	
	white ash	---	---	
Sm:				
Sloan	eastern cottonwood	---	---	American sycamore, baldcypress, bur oak, eastern cottonwood, green ash, pin oak, red maple, river birch, silver maple, swamp white oak, sweetgum, white ash
	green ash	---	---	
	pin oak	85	72	
	red maple	---	---	
	swamp white oak	---	---	
Sn:				
Sloan	pin oak	85	72	American sycamore, eastern cottonwood, red maple, black willow, pin oak, swamp white oak
	swamp white oak	---	---	
	red maple	---	---	
So:				
Sloan	eastern cottonwood	---	---	American sycamore, eastern cottonwood, green ash, pin oak, red maple, silver maple, swamp white oak, sweetgum
	green ash	---	---	
	pin oak	86	72	
	red maple	---	---	
	swamp white oak	---	---	
SpB:				
Spinks	black cherry	---	---	Carolina poplar, eastern white pine, red pine
	black oak	---	---	
	northern red oak	66	57	
	white oak	---	---	
SpC:				
Spinks	black cherry	---	---	Carolina poplar, eastern white pine, red pine
	black oak	---	---	
	northern red oak	66	57	
	white oak	---	---	

Table 12.--Woodland Productivity--Continued

Map symbol and soil name	Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
SpD:				
Spinks	black cherry	---	---	Carolina poplar, eastern white pine, red pine
	black oak	---	---	
	northern red oak	66	57	
	white oak	---	---	
TdA:				
Tedrow	black oak	---	---	black oak, jack pine, northern red oak, red pine, tuliptree, white ash, white spruce
	bur oak	75	57	
	green ash	---	---	
	northern red oak	---	---	
	quaking aspen	---	---	
	red maple	---	---	
	slippery elm	---	---	
TeA:				
Tedrow Variant	black oak	---	---	black oak, jack pine, northern red oak, red pine, tuliptree, white ash, white spruce
	bur oak	75	57	
	green ash	---	---	
	northern red oak	---	---	
	quaking aspen	---	---	
	red maple	---	---	
	slippery elm	---	---	
To:				
Toledo	eastern cottonwood	---	---	American sycamore, eastern cottonwood, green ash, pin oak, red maple, silver maple, swamp white oak, sweetgum
	green ash	---	---	
	pin oak	80	57	
	red maple	---	---	
	swamp white oak	80	---	
Tt:				
Toledo	eastern cottonwood	---	---	American sycamore, eastern cottonwood, green ash, pin oak, red maple, silver maple, swamp white oak, sweetgum
	green ash	---	---	
	pin oak	80	57	
	red maple	---	---	
	swamp white oak	80	---	
TuB2:				
Tuscola	American basswood	---	---	Austrian pine, black walnut, eastern white pine, northern red oak, red pine, tuliptree, white ash
	black walnut	---	---	
	northern red oak	86	72	
	sugar maple	---	---	
	tuliptree	---	---	
	white ash	---	---	
	white oak	---	---	
TuC2:				
Tuscola	American basswood	---	---	Austrian pine, black walnut, eastern white pine, northern red oak, red pine, tuliptree, white ash
	black walnut	---	---	
	northern red oak	86	72	
	sugar maple	---	---	
	tuliptree	---	---	
	white ash	---	---	
	white oak	---	---	

Table 12.--Woodland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
Ud:				
Udorthents	---	---	---	---
Ur:				
Urban Land	---	---	---	---
VaA:				
Vaughnsville	black cherry	---	---	black cherry, black walnut, eastern white pine, red pine, tuliptree, white ash
	black walnut	---	---	
	northern red oak	80	57	
	tuliptree	---	---	
	white ash	---	---	
	white oak	75	57	
W:				
Water	---	---	---	---
Wa:				
Wabasha	black cherry	---	---	American sycamore, eastern cottonwood, green ash, pin oak, red maple, silver maple, swamp white oak, sweetgum
	eastern cottonwood	---	---	
	green ash	---	---	
	pin oak	80	57	
	red maple	---	---	
	swamp white oak	---	---	
Wc:				
Warners	American sycamore	---	0	American sycamore, eastern cottonwood, green ash, pin oak, red maple, silver maple, swamp white oak, sweetgum
	black willow	---	0	
	eastern cottonwood	80	86	
	green ash	---	0	
	pin oak	---	0	
	red maple	56	29	
	swamp white oak	---	0	
Wf:				
Wauseon	black cherry	---	---	American sycamore, baldcypress, eastern cottonwood, green ash, pin oak, red maple, silver maple, swamp white oak, sweetgum
	eastern cottonwood	90	100	
	green ash	---	---	
	pin oak	---	---	
	red maple	---	---	
	silver maple	70	29	
	swamp white oak	90	72	
Wg:				
Wauseon	black cherry	---	---	American sycamore, baldcypress, eastern cottonwood, green ash, pin oak, red maple, silver maple, swamp white oak, sweetgum
	eastern cottonwood	90	100	
	green ash	---	---	
	pin oak	---	---	
	red maple	---	---	
	silver maple	70	29	
	swamp white oak	90	72	

TABLE 13.--WOODLAND HARVESTING ACTIVITIES

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text on page 192 for further explanation of ratings in this table.)

Map symbol and soil name	Limitations affecting construction of haul roads and log landings		Suitability for roads (natural surface)		Harvest equipment operability	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ad:						
Adrian	Severe		Poorly suited		Poorly suited	
	Low strength	1.00	Ponding	1.00	Low strength	1.00
			Low strength	1.00		
			Depth to saturated zone	1.00		
ArB:						
Arkport	Slight		Well suited		Well suited	
ArC:						
Arkport	Slight		Moderately suited		Well suited	
			Slope	0.50		
AsA:						
Aurand	Slight		Moderately suited		Well suited	
			Depth to saturated zone	0.50		
AtA:						
Aurand	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
			Low strength	0.50		
BcA:						
Bixler	Slight		Well suited		Well suited	
Ca:						
Clay Pits	Not rated					
Ch:						
Cohoctah	Severe		Poorly suited		Well suited	
	Flooding	1.00	Flooding	1.00		
			Depth to saturated zone	1.00		
Ck:						
Colwood	Slight		Poorly suited		Well suited	
			Ponding	1.00		
			Depth to saturated zone	1.00		
Cm:						
Colwood	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		
Cn:						
Colwood	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		

Table 13.--Woodland Harvesting Activities--Continued

Map symbol and soil name	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value	Harvest equipment operability: Rating class and limiting features	Value
Co:						
Colwood	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		
Cu:						
Cut And Fill Land	Not rated					
DeA:						
Del Rey	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
			Low strength	0.50		
DfA:						
Del Rey	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
			Low strength	0.50		
DuA:						
Digby	Slight		Moderately suited		Well suited	
			Depth to saturated zone	0.50		
DyA:						
Digby	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
			Low strength	0.50		
DzA:						
Digby	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
			Depth to saturated zone	0.50		
Ee:						
Eel	Severe		Poorly suited		Moderately suited	
	Flooding	1.00	Flooding	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50		
			Depth to saturated zone	0.50		
FsA:						
Fulton	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
			Low strength	0.50		
FsB:						
Fulton	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
			Low strength	0.50		

Table 13.--Woodland Harvesting Activities--Continued

Map symbol and soil name	Limitations affecting construction of haul roads and log landings		Suitability for roads (natural surface)		Harvest equipment operability	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
FuA:						
Fulton	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
			Low strength	0.50		
FuB:						
Fulton	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
			Low strength	0.50		
FvA:						
Fulton Variant	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
			Low strength	0.50		
GaA:						
Galen	Slight		Well suited		Well suited	
GaB:						
Galen	Slight		Well suited		Well suited	
GbB:						
Galen	Slight		Moderately suited		Well suited	
			Depth to saturated zone	0.50		
Gm:						
Genesee	Severe		Poorly suited		Moderately suited	
	Flooding	1.00	Flooding	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50		
Go:						
Gilford	Slight		Poorly suited		Well suited	
			Ponding	1.00		
			Depth to saturated zone	1.00		
Gr:						
Granby	Slight		Poorly suited		Well suited	
			Ponding	1.00		
			Depth to saturated zone	1.00		
Gv:						
Gravel Pits	Not rated					
HaA:						
Haney	Slight		Moderately suited		Well suited	
			Depth to saturated zone	0.50		

Table 13.--Woodland Harvesting Activities--Continued

Map symbol and soil name	Limitations affecting construction of haul roads and log landings		Suitability for roads (natural surface)		Harvest equipment operability	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HaB:						
Haney	Slight		Moderately suited		Well suited	
			Depth to saturated zone	0.50		
HdA:						
Haney	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
			Depth to saturated zone	0.50		
HdB:						
Haney	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
			Depth to saturated zone	0.50		
HeC:						
Haney	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Slope	0.50	Low strength	0.50
			Low strength	0.50		
			Depth to saturated zone	0.50		
Rawson	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Slope	0.50	Low strength	0.50
			Low strength	0.50		
HkA:						
Haskins	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	1.00	Low strength	0.50
			Low strength	0.50		
HlA:						
Haskins	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	1.00	Low strength	0.50
			Low strength	0.50		
HlB:						
Haskins	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
			Low strength	0.50		
HnA:						
Haskins	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	1.00	Low strength	0.50
			Low strength	0.50		
Ho:						
Hoytville	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		

Table 13.--Woodland Harvesting Activities--Continued

Map symbol and soil name	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value	Harvest equipment operability: Rating class and limiting features	Value
Hp:						
Hoytville-----------	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		
Hr:						
Hoytville-----------	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		
Hs:						
Hoytville-----------	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
	Stickiness	0.50	Depth to saturated zone	1.00	Stickiness	0.50
			Low strength	0.50		
			Stickiness	0.50		
Hv:						
Hoytville-----------	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
	Stickiness	0.50	Depth to saturated zone	1.00	Stickiness	0.50
			Low strength	0.50		
			Stickiness	0.50		
Hw:						
Hoytville Variant---	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
	Stickiness	0.50	Depth to saturated zone	1.00	Stickiness	0.50
			Low strength	0.50		
			Stickiness	0.50		
KeA:						
Kibbie--------------	Slight		Moderately suited		Well suited	
			Depth to saturated zone	0.50		
KfA:						
Kibbie--------------	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	1.00	Low strength	0.50
			Low strength	0.50		
KlA:						
Kibbie--------------	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	1.00	Low strength	0.50
			Low strength	0.50		
La:						
Latty---------------	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		

Table 13.--Woodland Harvesting Activities--Continued

Map symbol and soil name	Limitations affecting construction of haul roads and log landings		Suitability for roads (natural surface)		Harvest equipment operability	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Lb:						
Latty	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
	Stickiness	0.50	Depth to saturated zone	1.00	Stickiness	0.50
			Low strength	0.50		
			Stickiness	0.50		
Le:						
Lenawee	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		
Lf:						
Lenawee	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		
LwB2:						
Lucas	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
LwC2:						
Lucas	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Slope	0.50	Low strength	0.50
			Low strength	0.50		
LxC3:						
Lucas	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Slope	0.50	Low strength	0.50
			Low strength	0.50		
LxE3:						
Lucas	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Slope	0.50
	Low strength	0.50	Low strength	0.50	Low strength	0.50
Mb:						
Mermill	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		
Aurand	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
			Low strength	0.50		
Mc:						
Mermill	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		

Table 13.--Woodland Harvesting Activities--Continued

Map symbol and soil name	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value	Harvest equipment operability: Rating class and limiting features	Value
Md:						
Medway	Severe		Poorly suited		Moderately suited	
	Flooding	1.00	Flooding	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50		
Me:						
Mermill	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		
Mf:						
Mermill	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		
Mg:						
Mermill	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		
Mh:						
Millgrove	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		
Mk:						
Millgrove	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		
NaA:						
Nappanee	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	1.00	Low strength	0.50
			Low strength	0.50		
NaB:						
Nappanee	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	1.00	Low strength	0.50
			Low strength	0.50		
NtA:						
Nappanee	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	1.00	Low strength	0.50
			Low strength	0.50		

Table 13.--Woodland Harvesting Activities--Continued

Map symbol and soil name	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value	Harvest equipment operability: Rating class and limiting features	Value
NtB:						
Nappanee	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	1.00	Low strength	0.50
			Low strength	0.50		
NtB2:						
Nappanee	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	1.00	Low strength	0.50
			Low strength	0.50		
OaC:						
Oakville	Slight		Moderately suited		Well suited	
			Slope	0.50		
ObB:						
Oakville	Moderate		Well suited		Well suited	
	Too sandy	0.50				
ObC:						
Oakville	Slight		Moderately suited		Well suited	
			Slope	0.50		
OsB:						
Oshtemo	Slight		Well suited		Well suited	
OtB:						
Ottokee	Slight		Well suited		Well suited	
OuB:						
Ottokee	Slight		Well suited		Well suited	
OzB:						
Ottokee	Slight		Well suited		Well suited	
Spinks	Slight		Well suited		Well suited	
Pa:						
Paulding	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
	Stickiness	0.50	Depth to saturated zone	1.00	Stickiness	0.50
			Low strength	0.50		
			Stickiness	0.50		
Pt:						
Pits, Quarry	Not rated					
RaB:						
Rawson	Slight		Well suited		Well suited	
RdB:						
Rawson	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50

Table 13.--Woodland Harvesting Activities--Continued

Map symbol and soil name	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value	Harvest equipment operability: Rating class and limiting features	Value
ReB:						
Rawson	Slight		Well suited		Well suited	
RfA:						
Rimer	Slight		Poorly suited		Well suited	
			Depth to saturated zone	1.00		
RgA:						
Rimer	Slight		Moderately suited		Well suited	
			Depth to saturated zone	0.50		
RhB:						
Rimer	Slight		Moderately suited		Well suited	
			Depth to saturated zone	0.50		
Tedrow	Slight		Moderately suited		Well suited	
			Depth to saturated zone	0.50		
RmA:						
Rimer	Slight		Poorly suited		Well suited	
			Depth to saturated zone	1.00		
RoA:						
Roselms	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	1.00	Low strength	0.50
	Stickiness	0.50	Low strength	0.50		
RrA:						
Roselms	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
			Low strength	0.50		
Rs:						
Ross	Severe		Poorly suited		Moderately suited	
	Flooding	1.00	Flooding	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50		
SaE3:						
St. Clair	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Stickiness	0.50	Low strength	0.50	Slope	0.50
	Low strength	0.50				
SbB2:						
St. Clair	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
	Stickiness	0.50	Depth to saturated zone	0.50		

Table 13.--Woodland Harvesting Activities--Continued

Map symbol and soil name	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value	Harvest equipment operability: Rating class and limiting features	Value
SbC2:						
St. Clair	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Slope	0.50	Low strength	0.50
	Stickiness	0.50	Low strength	0.50		
			Depth to saturated zone	0.50		
SbD2:						
St. Clair	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Slope	1.00	Low strength	0.50
			Low strength	0.50		
SbE2:						
St. Clair	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50	Slope	0.50
	Stickiness	0.50				
ScC3:						
St. Clair	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Slope	0.50	Low strength	0.50
	Stickiness	0.50	Low strength	0.50	Stickiness	0.50
			Stickiness	0.50		
			Depth to saturated zone	0.50		
ScD3:						
St. Clair	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Stickiness	0.50	Low strength	0.50	Stickiness	0.50
	Low strength	0.50	Stickiness	0.50		
			Depth to saturated zone	0.50		
ScE3:						
St. Clair	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50	Slope	0.50
	Stickiness	0.50	Stickiness	0.50	Stickiness	0.50
			Depth to saturated zone	0.50		
ScF3:						
St. Clair	Severe		Poorly suited		Moderately suited	
	Slope	1.00	Slope	1.00	Slope	0.50
	Low strength	0.50	Low strength	0.50	Low strength	0.50
			Stickiness	0.50	Stickiness	0.50
			Depth to saturated zone	0.50		
SdB:						
Seward	Slight		Well suited		Well suited	
SdC:						
Seward	Slight		Moderately suited		Well suited	
			Slope	0.50		
SdD:						
Seward	Moderate		Poorly suited		Well suited	
	Slope	0.50	Slope	1.00		

Table 13.--Woodland Harvesting Activities--Continued

Map symbol and soil name	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value	Harvest equipment operability: Rating class and limiting features	Value
SeB:						
Seward	Slight		Well suited		Well suited	
SeC:						
Seward	Slight		Moderately suited		Well suited	
			Slope	0.50		
SfA:						
Shinrock Variant	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
			Depth to saturated zone	0.50		
Sh:						
Shoals	Severe		Poorly suited		Moderately suited	
	Flooding	1.00	Flooding	1.00	Low strength	0.50
	Low strength	0.50	Depth to saturated zone	1.00		
			Low strength	0.50		
Sm:						
Sloan	Severe		Poorly suited		Moderately suited	
	Flooding	1.00	Ponding	1.00	Low strength	0.50
	Low strength	0.50	Flooding	1.00		
			Depth to saturated zone	1.00		
			Low strength	0.50		
Sn:						
Sloan	Severe		Poorly suited		Moderately suited	
	Flooding	1.00	Flooding	1.00	Low strength	0.50
	Low strength	0.50	Depth to saturated zone	1.00		
			Low strength	0.50		
So:						
Sloan	Severe		Poorly suited		Moderately suited	
	Flooding	1.00	Flooding	1.00	Low strength	0.50
	Low strength	0.50	Depth to saturated zone	1.00		
			Low strength	0.50		
SpB:						
Spinks	Slight		Well suited		Well suited	
SpC:						
Spinks	Slight		Moderately suited		Well suited	
			Slope	0.50		
SpD:						
Spinks	Moderate		Poorly suited		Well suited	
	Slope	0.50	Slope	1.00		
TdA:						
Tedrow	Slight		Poorly suited		Well suited	
			Depth to saturated zone	1.00		

Table 13.--Woodland Harvesting Activities--Continued

Map symbol and soil name	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value	Harvest equipment operability: Rating class and limiting features	Value
TeA:						
Tedrow Variant	Slight		Poorly suited		Well suited	
			Depth to saturated zone	1.00		
To:						
Toledo	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		
Tt:						
Toledo	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		
TuB2:						
Tuscola	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
TuC2:						
Tuscola	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Slope	0.50	Low strength	0.50
			Low strength	0.50		
Ud:						
Udorthents	Not rated		Not rated		Not rated	
Ur:						
Urban Land	Not rated					
VaA:						
Vaughnsville	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
W:						
Water	Not rated					
Wa:						
Wabasha	Severe		Poorly suited		Moderately suited	
	Flooding	1.00	Flooding	1.00	Low strength	0.50
	Low strength	0.50	Depth to saturated zone	1.00	Stickiness	0.50
	Stickiness	0.50	Low strength	0.50		
			Stickiness	0.50		
Wc:						
Warners	Severe		Poorly suited		Poorly suited	
	Low strength	1.00	Low strength	1.00	Low strength	1.00
			Depth to saturated zone	1.00		

Table 13.--Woodland Harvesting Activities--Continued

Map symbol and soil name	Limitations affecting construction of haul roads and log landings		Suitability for roads (natural surface)		Harvest equipment operability	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Wf:						
Wauseon	Slight		Poorly suited		Well suited	
			Ponding	1.00		
			Depth to saturated zone	1.00		
Wg:						
Wauseon	Slight		Poorly suited		Well suited	
			Ponding	1.00		
			Depth to saturated zone	1.00		

TABLE 14.--WOODLAND REGENERATION ACTIVITIES

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text on page 192 for further explanation of ratings in this table.)

Map symbol and soil name	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for site preparation: Rating class and limiting features	Value	Potential for damage to soil by fire: Rating class and limiting features	Value
Ad:						
Adrian	Well suited		Well suited		Low	
ArB:						
Arkport	Well suited		Well suited		High	
					Texture/rock fragments	1.00
ArC:						
Arkport	Moderately suited		Well suited		High	
	Slope	0.50			Texture/rock fragments	1.00
AsA:						
Aurand	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
AtA:						
Aurand	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
BcA:						
Bixler	Well suited		Well suited		High	
					Texture/rock fragments	1.00
Ca:						
Ch:						
Cohoctah	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
Ck:						
Colwood	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
Cm:						
Colwood	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
Cn:						
Colwood	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
Co:						
Colwood	Well suited		Well suited		Low	

Table 14.--Woodland Regeneration Activities--Continued

Map symbol and soil name	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for site preparation: Rating class and limiting features	Value	Potential for damage to soil by fire: Rating class and limiting features	Value
					Texture/rock fragments	0.01
Cu:						
DeA:						
Del Rey	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.01
DfA:						
Del Rey	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.01
DuA:						
Digby	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
DyA:						
Digby	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
DzA:						
Digby	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
Ee:						
Eel	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
FsA:						
Fulton	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.01
FsB:						
Fulton	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.01
FuA:						
Fulton	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.30
FuB:						
Fulton	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.30
FvA:						
Fulton Variant	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.01

Table 14.--Woodland Regeneration Activities--Continued

Map symbol and soil name	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for site preparation: Rating class and limiting features	Value	Potential for damage to soil by fire: Rating class and limiting features	Value
GaA:						
Galen	Well suited		Well suited		Moderate	
					Texture/rock fragments	0.50
GaB:						
Galen	Well suited		Well suited		Moderate	
					Texture/rock fragments	0.50
GbB:						
Galen	Well suited		Well suited		Moderate	
					Texture/rock fragments	0.50
Gm:						
Genesee	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
Go:						
Gilford	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
Gr:						
Granby	Well suited		Well suited		Moderate	
					Texture/rock fragments	0.50
Gv:						
HaA:						
Haney	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
HaB:						
Haney	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
HdA:						
Haney	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
HdB:						
Haney	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
HeC:						
Haney	Moderately suited		Well suited		Low	
	Slope	0.50			Texture/rock fragments	0.01
Rawson	Moderately suited		Well suited		Low	
	Slope	0.50			Texture/rock fragments	0.01

Table 14.--Woodland Regeneration Activities--Continued

Map symbol and soil name	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for site preparation: Rating class and limiting features	Value	Potential for damage to soil by fire: Rating class and limiting features	Value
HkA:						
Haskins	Well suited		Well suited		Moderate	
					Texture/rock fragments	0.50
HlA:						
Haskins	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
HlB:						
Haskins	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
HnA:						
Haskins	Well suited		Well suited		Moderate	
					Texture/rock fragments	0.50
Ho:						
Hoytville	Poorly suited		Poorly suited		Low	
	Stickiness	0.75	Stickiness	0.50	Texture/rock fragments	0.01
Hp:						
Hoytville	Moderately suited		Poorly suited		Low	
	Stickiness	0.50	Stickiness	0.50	Texture/rock fragments	0.30
Hr:						
Hoytville	Moderately suited		Poorly suited		Low	
	Stickiness	0.50	Stickiness	0.50	Texture/rock fragments	0.01
Hs:						
Hoytville	Moderately suited		Poorly suited		Low	
	Stickiness	0.50	Stickiness	0.50	Texture/rock fragments	0.30
Hv:						
Hoytville	Poorly suited		Poorly suited		Low	
	Stickiness	0.75	Stickiness	0.50	Texture/rock fragments	0.30
Hw:						
Hoytville Variant	Moderately suited		Poorly suited		Low	
	Stickiness	0.50	Stickiness	0.50	Texture/rock fragments	0.30
KeA:						
Kibbie	Well suited		Well suited		High	
					Texture/rock fragments	1.00
KfA:						
Kibbie	Well suited		Well suited		Low	
					Texture/rock fragments	0.01

Table 14.--Woodland Regeneration Activities--Continued

Map symbol and soil name	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for site preparation: Rating class and limiting features	Value	Potential for damage to soil by fire: Rating class and limiting features	Value
KlA:						
Kibbie	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
La:						
Latty	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.30
Lb:						
Latty	Poorly suited		Poorly suited		Low	
	Stickiness	0.75	Stickiness	0.50	Texture/rock fragments	0.30
Le:						
Lenawee	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.01
Lf:						
Lenawee	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.30
LwB2:						
Lucas	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.30
LwC2:						
Lucas	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.30
	Slope	0.50				
LxC3:						
Lucas	Moderately suited		Well suited		Moderate	
	Stickiness	0.50			Texture/rock fragments	0.70
	Slope	0.50				
LxE3:						
Lucas	Unsuited		Poorly suited		Moderate	
	Slope	1.00	Slope	0.75	Texture/rock fragments	0.70
	Stickiness	0.50				
Mb:						
Mermill	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
Aurand	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
Mc:						
Mermill	Well suited		Well suited		Low	

Table 14.--Woodland Regeneration Activities--Continued

Map symbol and soil name	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for site preparation: Rating class and limiting features	Value	Potential for damage to soil by fire: Rating class and limiting features	Value
					Texture/rock fragments	0.30
Md:						
Medway	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
Me:						
Mermill	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
Mf:						
Mermill	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
Mg:						
Mermill	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
Mh:						
Millgrove	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
Mk:						
Millgrove	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
NaA:						
Nappanee	Poorly suited		Poorly suited		Low	
	Stickiness	0.75	Stickiness	0.50	Texture/rock fragments	0.01
NaB:						
Nappanee	Poorly suited		Poorly suited		Low	
	Stickiness	0.75	Stickiness	0.50	Texture/rock fragments	0.01
NtA:						
Nappanee	Poorly suited		Poorly suited		Low	
	Stickiness	0.75	Stickiness	0.50	Texture/rock fragments	0.30
NtB:						
Nappanee	Poorly suited		Poorly suited		Low	
	Stickiness	0.75	Stickiness	0.50	Texture/rock fragments	0.30
NtB2:						
Nappanee	Poorly suited		Poorly suited		Low	
	Stickiness	0.75	Stickiness	0.50	Texture/rock fragments	0.30
OaC:						
Oakville	Moderately suited		Well suited		High	

Table 14.--Woodland Regeneration Activities--Continued

Map symbol and soil name	Suitability for mechanical planting		Suitability for site preparation		Potential for damage to soil by fire	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
	Slope	0.50			Texture/rock fragments	1.00
ObB:						
Oakville------------	Moderately suited		Well suited		High	
	Too sandy	0.50			Texture/rock fragments	1.00
ObC:						
Oakville------------	Moderately suited		Well suited		High	
	Slope	0.50			Texture/rock fragments	1.00
	Too sandy	0.50				
OsB:						
Oshtemo-------------	Well suited		Well suited		Moderate	
					Texture/rock fragments	0.50
OtB:						
Ottokee-------------	Well suited		Well suited		High	
					Texture/rock fragments	1.00
OuB:						
Ottokee-------------	Well suited		Well suited		High	
					Texture/rock fragments	1.00
OzB:						
Ottokee-------------	Well suited		Well suited		High	
					Texture/rock fragments	1.00
Spinks--------------	Well suited		Well suited		High	
					Texture/rock fragments	1.00
Pa:						
Paulding------------	Poorly suited		Poorly suited		Low	
	Stickiness	0.75	Stickiness	0.50	Texture/rock fragments	0.30
Pt:						
RaB:						
Rawson--------------	Well suited		Well suited		Moderate	
					Texture/rock fragments	0.50
RdB:						
Rawson--------------	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
ReB:						
Rawson--------------	Moderately suited		Well suited		Low	
	Rock fragment content	0.25			Texture/rock fragments	0.01

Table 14.--Woodland Regeneration Activities--Continued

Map symbol and soil name	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for site preparation: Rating class and limiting features	Value	Potential for damage to soil by fire: Rating class and limiting features	Value
RfA:						
Rimer	Well suited		Well suited		Moderate	
					Texture/rock fragments	0.50
RgA:						
Rimer	Well suited		Well suited		Moderate	
					Texture/rock fragments	0.50
RhB:						
Rimer	Well suited		Well suited		Moderate	
					Texture/rock fragments	0.50
Tedrow	Well suited		Well suited		Moderate	
					Texture/rock fragments	0.50
RmA:						
Rimer	Well suited		Well suited		Moderate	
					Texture/rock fragments	0.50
RoA:						
Roselms	Moderately suited		Poorly suited		Low	
	Stickiness	0.50	Stickiness	0.50	Texture/rock fragments	0.30
RrA:						
Roselms	Poorly suited		Poorly suited		Low	
	Stickiness	0.75	Stickiness	0.50	Texture/rock fragments	0.30
Rs:						
Ross	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
SaE3:						
St. Clair	Unsuited		Poorly suited		Moderate	
	Slope	1.00	Slope	0.75	Texture/surface depth/rock fragments	0.50
	Stickiness	0.50	Stickiness	0.50		
SbB2:						
St. Clair	Moderately suited		Poorly suited		Low	
	Stickiness	0.50	Stickiness	0.50	Texture/rock fragments	0.30
SbC2:						
St. Clair	Moderately suited		Poorly suited		Low	
	Stickiness	0.50	Stickiness	0.50	Texture/rock fragments	0.30
	Slope	0.50				
SbD2:						
St. Clair	Moderately suited		Poorly suited		Moderate	
	Slope	0.50	Stickiness	0.50	Texture/rock fragments	0.70

Table 14.--Woodland Regeneration Activities--Continued

Map symbol and soil name	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for site preparation: Rating class and limiting features	Value	Potential for damage to soil by fire: Rating class and limiting features	Value
	Stickiness	0.50				
SbE2:						
St. Clair-----------	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/rock fragments	0.70
	Stickiness	0.50	Stickiness	0.50		
ScC3:						
St. Clair-----------	Moderately suited		Poorly suited		Moderate	
	Stickiness	0.50	Stickiness	0.50	Texture/rock fragments	0.70
	Slope	0.50				
ScD3:						
St. Clair-----------	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/rock fragments	0.70
	Stickiness	0.50	Stickiness	0.50		
ScE3:						
St. Clair-----------	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/rock fragments	0.70
	Stickiness	0.50	Stickiness	0.50		
ScF3:						
St. Clair-----------	Unsuited		Poorly suited		Low	
	Slope	1.00	Slope	0.75		
	Stickiness	0.50	Stickiness	0.50		
SdB:						
Seward--------------	Well suited		Well suited		High	
					Texture/rock fragments	1.00
SdC:						
Seward--------------	Moderately suited		Well suited		High	
	Slope	0.50			Texture/rock fragments	1.00
SdD:						
Seward--------------	Poorly suited		Poorly suited		High	
	Slope	0.75	Slope	0.75	Texture/rock fragments	1.00
SeB:						
Seward--------------	Well suited		Well suited		High	
					Texture/rock fragments	1.00
SeC:						
Seward--------------	Moderately suited		Well suited		High	
	Slope	0.50			Texture/rock fragments	1.00
SfA:						
Shinrock Variant----	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.01

Table 14.--Woodland Regeneration Activities--Continued

Map symbol and soil name	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for site preparation: Rating class and limiting features	Value	Potential for damage to soil by fire: Rating class and limiting features	Value
Sh:						
Shoals	Well suited		Well suited		Low	
					Texture/surface depth/rock fragments	0.30
Sm:						
Sloan	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.30
Sn:						
Sloan	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
So:						
Sloan	Well suited		Well suited		Low	
					Texture/rock fragments	0.30
SpB:						
Spinks	Well suited		Well suited		Moderate	
					Texture/rock fragments	0.50
SpC:						
Spinks	Moderately suited		Well suited		Moderate	
	Slope	0.50			Texture/rock fragments	0.50
SpD:						
Spinks	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/rock fragments	0.50
TdA:						
Tedrow	Well suited		Well suited		Moderate	
					Texture/rock fragments	0.50
TeA:						
Tedrow Variant	Well suited		Well suited		Moderate	
					Texture/rock fragments	0.50
To:						
Toledo	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.30
Tt:						
Toledo	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.30
TuB2:						
Tuscola	Well suited		Well suited		Moderate	
					Texture/rock fragments	0.50

Table 14.--Woodland Regeneration Activities--Continued

Map symbol and soil name	Suitability for mechanical planting		Suitability for site preparation		Potential for damage to soil by fire	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
TuC2:						
Tuscola	Moderately suited		Well suited		Moderate	
	Slope	0.50			Texture/rock fragments	0.50
Ud:						
Udorthents	Not rated		Not rated			
Ur:						
VaA:						
Vaughnsville	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
W:						
Wa:						
Wabasha	Moderately suited		Poorly suited		Low	
	Stickiness	0.50	Stickiness	0.50	Texture/rock fragments	0.30
Wc:						
Warners	Well suited		Well suited		Low	
Wf:						
Wauseon	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
Wg:						
Wauseon	Well suited		Well suited		Moderate	
					Texture/rock fragments	0.50

TABLE 15.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS

(Absence of an entry indicates that trees generally do not grow to the given height. See text on page 193 for additional information.)

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
Ad: Adrian	common ninebark; silky dogwood; whitebelle honeysuckle	nannyberry	tall purple willow	black willow; golden willow	imperial Carolina poplar
ArB: Arkport	---	American cranberrybush	eastern redcedar; northern white-cedar; osageorange; Washington hawthorn	Austrian pine; Norway spruce; red pine	eastern white pine
ArC: Arkport	---	American cranberrybush	eastern redcedar; northern white-cedar; osageorange; Washington hawthorn	Austrian pine; Norway spruce; red pine	eastern white pine
AsA: Aurand	silky dogwood	American cranberrybush; European alder; Washington hawthorn	Austrian pine; baldcypress; eastern redcedar; northern white-cedar	Norway spruce; pin oak	green ash
AtA: Aurand	silky dogwood	American cranberrybush; European alder; Washington hawthorn	Austrian pine; baldcypress; eastern redcedar; northern white-cedar	Norway spruce; pin oak	green ash
BcA: Bixler	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
Ca: Clay pits	---	---	---	---	---
Ch: Cohoctah	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern white-cedar; Washington hawthorn; white fir	eastern white pine; Norway spruce	pin oak
Ck: Colwood	silky dogwood	American cranberrybush; baldcypress; european alder	Austrian pine; eastern redcedar; green ash; northern white-cedar; Washington hawthorn	Norway spruce; swamp white oak	pin oak
Cm: Colwood	silky dogwood	American cranberrybush; baldcypress; european alder	Austrian pine; eastern redcedar; green ash; northern white-cedar; Washington hawthorn	Norway spruce; swamp white oak	pin oak
Cn: Colwood	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern white-cedar; Washington hawthorn; white fir	eastern white pine; Norway spruce	pin oak
Co: Colwood	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern white-cedar; Washington hawthorn; white fir	eastern white pine; Norway spruce	pin oak
Cu: Cut and fill land	---	---	---	---	---
DeA: Del Rey	American cranberrybush	southern arrowwood	Austrian pine; eastern redcedar; green ash; osageorange; Washington hawthorn	eastern white pine; pin oak	---

TABLE 15.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
DfA: Del Rey	American cranberrybush	southern arrowwood	Austrian pine; eastern redcedar; green ash; osageorange; Washington hawthorn	eastern white pine; pin oak	---
DuA: Digby	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
DyA: Digby	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
DzA: Digby	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
Ee: Eel	silky dogwood	American cranberrybush; blackhaw; eastern redcedar; european alder; southern arrowwood; Washington hawthorn	blue spruce; northern white-cedar; osageorange	Austrian pine; Norway spruce	eastern white pine; pin oak
FsA: Fulton	American cranberrybush	southern arrowwood	Austrian pine; eastern redcedar; green ash; osageorange; Washington hawthorn	eastern white pine; pin oak	---
FsB: Fulton	American cranberrybush	southern arrowwood	Austrian pine; eastern redcedar; green ash; osageorange; Washington hawthorn	eastern white pine; pin oak	---
FuA: Fulton	American cranberrybush	southern arrowwood	Austrian pine; eastern redcedar; green ash; osageorange; Washington hawthorn	eastern white pine; pin oak	---
FuB: Fulton	American cranberrybush	southern arrowwood	Austrian pine; eastern redcedar; green ash; osageorange; Washington hawthorn	eastern white pine; pin oak	---
FvA: Fulton Variant	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
GaA: Galen	---	American cranberrybush	eastern redcedar; northern white-cedar; osageorange; Washington hawthorn	Austrian pine; Norway spruce; red pine	eastern white pine
GaB: Galen	---	American cranberrybush	eastern redcedar; northern white-cedar; osageorange; Washington hawthorn	Austrian pine; Norway spruce; red pine	eastern white pine
GbB: Galen	---	American cranberrybush	eastern redcedar; northern white-cedar; osageorange; Washington hawthorn	Austrian pine; Norway spruce; red pine	eastern white pine

TABLE 15.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
Gm: Genesee	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
Go: Gilford	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern white-cedar; Washington hawthorn; white fir	eastern white pine; Norway spruce	pin oak
Gr: Granby	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern white-cedar; Washington hawthorn; white fir	eastern white pine; Norway spruce	pin oak
Gv: Gravel pits	---	---	---	---	---
HaA: Haney	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
HaB: Haney	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
HdA: Haney	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
HdB: Haney	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
HeC: Haney	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
Rawson	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
HkA: Haskins	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
HlA: Haskins	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
HlB: Haskins	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
HnA: Haskins	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
Ho: Hoytville	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern white-cedar; Washington hawthorn; white fir	eastern white pine; Norway spruce	pin oak

TABLE 15.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
Hp: Hoytville	silky dogwood	American cranberrybush; baldcypress; European alder	arborvitae; Austrian pine; eastern redcedar; green ash; Washington hawthorn	Norway spruce; swamp white oak	pin oak
Hr: Hoytville	silky dogwood	American cranberrybush; baldcypress; European alder	Austrian pine; eastern redcedar; green ash; northern white-cedar; Washington hawthorn	Norway spruce; swamp white oak	pin oak
Hs: Hoytville	silky dogwood	American cranberrybush; baldcypress; European alder	Austrian pine; eastern redcedar; green ash; northern white-cedar; Washington hawthorn	Norway spruce; swamp white oak	pin oak
Hv: Hoytville	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern white-cedar; Washington hawthorn; white fir	eastern white pine; Norway spruce	pin oak
Hw: Hoytville Variant	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern white-cedar; Washington hawthorn	eastern white pine; Norway spruce	pin oak
KeA: Kibbie	silky dogwood	American cranberrybush; european alder; Washington hawthorn	Austrian pine; baldcypress; eastern redcedar; northern white-cedar	Norway spruce; pin oak	green ash
KfA: Kibbie	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
KlA: Kibbie	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
La: Latty	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern white-cedar; Washington hawthorn; white fir	eastern white pine; Norway spruce	pin oak
Lb: Latty	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern white-cedar; Washington hawthorn; white fir	eastern white pine; Norway spruce	pin oak
Le: Lenawee	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern white-cedar; Washington hawthorn; white fir	eastern white pine; Norway spruce	pin oak
Lf: Lenawee	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern white-cedar; Washington hawthorn; white fir	eastern white pine; Norway spruce	pin oak
LwB2: Lucas	American cranberrybush	southern arrowwood	Austrian pine; eastern redcedar; green ash; osageorange; Washington hawthorn	eastern white pine; pin oak	---

TABLE 15.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
LwC2:					
Lucas	American cranberrybush	southern arrowwood	Austrian pine; eastern redcedar; green ash; osageorange; Washington hawthorn	eastern white pine; pin oak	---
LxC3:					
Lucas	common lilac	---	Austrian pine; eastern redcedar	Virginia pine	---
LxE3:					
Lucas	common lilac	---	Austrian pine; eastern redcedar	Virginia pine	---
Mb:					
Mermill	silky dogwood	American cranberrybush; baldcypress; European alder	Austrian pine; eastern redcedar; green ash; northern white-cedar; Washington hawthorn	Norway spruce; swamp white oak	pin oak
Aurand	silky dogwood	American cranberrybush; European alder; Washington hawthorn	Austrian pine; baldcypress; eastern redcedar; northern white-cedar	Norway spruce; pin oak	green ash
Mc:					
Mermill	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern white-cedar; Washington hawthorn; white fir	eastern white pine; Norway spruce	pin oak
Md:					
Medway	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine
Me:					
Mermill	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern white-cedar; Washington hawthorn; white fir	eastern white pine; Norway spruce	pin oak
Mf:					
Mermill	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern white-cedar; Washington hawthorn; white fir	eastern white pine; Norway spruce	pin oak
Mg:					
Mermill	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern white-cedar; Washington hawthorn; white fir	eastern white pine; Norway spruce	pin oak
Mh:					
Millgrove	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern white-cedar; Washington hawthorn; white fir	eastern white pine; Norway spruce	pin oak
Mk:					
Millgrove	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern white-cedar; Washington hawthorn; white fir	eastern white pine; Norway spruce	pin oak
NaA:					
Nappanee	American cranberrybush	southern arrowwood	Austrian pine; eastern redcedar; green ash; osageorange; Washington hawthorn	eastern white pine; pin oak	---
NaB:					
Nappanee	American cranberrybush	southern arrowwood	Austrian pine; eastern redcedar; green ash; osageorange; Washington hawthorn	eastern white pine; pin oak	---

TABLE 15.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
NtA: Nappanee	American cranberrybush	southern arrowwood	Austrian pine; eastern redcedar; green ash; osageorange; Washington hawthorn	eastern white pine; pin oak	---
NtB: Nappanee	American cranberrybush	southern arrowwood	Austrian pine; eastern redcedar; green ash; osageorange; Washington hawthorn	eastern white pine; pin oak	---
NtB2: Nappanee	American cranberrybush	southern arrowwood	Austrian pine; eastern redcedar; green ash; osageorange; Washington hawthorn	eastern white pine; pin oak	---
OaC: Oakville	common lilac; Siberian peashrub	radiant crabapple; Washington hawthorn	Austrian pine; eastern redcedar; jack pine; red pine	eastern white pine	---
ObB: Oakville	common lilac; Siberian peashrub	radiant crabapple; Washington hawthorn	Austrian pine; eastern redcedar; jack pine; red pine	eastern white pine	---
ObC: Oakville	common lilac; Siberian peashrub	radiant crabapple; Washington hawthorn	Austrian pine; eastern redcedar; jack pine; red pine	eastern white pine	---
OsB: Oshtemo	common lilac; Siberian peashrub	eastern redcedar; radiant crabapple; Washington hawthorn	Austrian pine; jack pine; red pine	eastern white pine	---
OtB: Ottokee	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
OuB: Ottokee	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
OzB: Ottokee	redbud	American cranberrybush; Washington hawthorn	blue spruce; northern white-cedar	Austrian pine; Norway spruce	eastern white pine
Spinks	redbud	American cranberrybush; Washington hawthorn	blue spruce; northern white-cedar	Austrian pine; Norway spruce	eastern white pine
Pa: Paulding	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern white-cedar; Washington hawthorn; white fir	eastern white pine; Norway spruce	pin oak
Pt: Pits, quarry	---	---	---	---	---
RaB: Rawson	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
RdB: Rawson	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
ReB: Rawson	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak

TABLE 15.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
RfA:					
Rimer	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
RgA:					
Rimer	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
RhB:					
Rimer	silky dogwood	American cranberrybush; European alder; Washington hawthorn	Austrian pine; baldcypress; eastern redcedar; northern white-cedar	Norway spruce; pin oak	green ash
Tedrow	silky dogwood	American cranberrybush; European alder; Washington hawthorn	Austrian pine; baldcypress; eastern redcedar; northern white-cedar	Norway spruce; pin oak	green ash
RmA:					
Rimer	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
RoA:					
Roselms	American cranberrybush	southern arrowwood	Austrian pine; eastern redcedar; green ash; osageorange; Washington hawthorn	eastern white pine; pin oak	---
RrA:					
Roselms	American cranberrybush	southern arrowwood	Austrian pine; eastern redcedar; green ash; osageorange; Washington hawthorn	eastern white pine; pin oak	---
Rs:					
Ross	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
SaE3:					
St. Clair	American cranberrybush	southern arrowwood	Austrian pine; eastern redcedar; green ash; osageorange; Washington hawthorn	eastern white pine; pin oak	---
SbB2:					
St. Clair	American cranberrybush	southern arrowwood	Austrian pine; eastern redcedar; green ash; osageorange; Washington hawthorn	eastern white pine; pin oak	---
SbC2:					
St. Clair	American cranberrybush	southern arrowwood	Austrian pine; eastern redcedar; green ash; osageorange; Washington hawthorn	eastern white pine; pin oak	---
SbD2:					
St. Clair	American cranberrybush; blackhaw	baldcypress; eastern redcedar; southern arrowwood; Washington hawthorn	Austrian pine; northern white-cedar; osageorange	black oak; green ash; Norway spruce; pin oak	northern red oak
SbE2:					
St. Clair	American cranberrybush; blackhaw	baldcypress; eastern redcedar; southern arrowwood; Washington hawthorn	Austrian pine; northern white-cedar; osageorange	black oak; green ash; Norway spruce; pin oak	northern red oak
ScC3:					
St. Clair	American cranberrybush	southern arrowwood	Austrian pine; eastern redcedar; green ash; osageorange; Washington hawthorn	eastern white pine; pin oak	---

TABLE 15.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
ScD3: St. Clair	American cranberrybush	southern arrowwood	Austrian pine; eastern redcedar; green ash; osageorange; Washington hawthorn	eastern white pine; pin oak	---
ScE3: St. Clair	American cranberrybush	southern arrowwood	Austrian pine; eastern redcedar; green ash; osageorange; Washington hawthorn	eastern white pine; pin oak	---
ScF3: St. Clair	American cranberrybush	southern arrowwood	Austrian pine; eastern redcedar; green ash; osageorange; Washington hawthorn	eastern white pine; pin oak	---
SdB: Seward	---	American cranberrybush	eastern redcedar; northern white-cedar; osageorange; Washington hawthorn	Austrian pine; Norway spruce; red pine	eastern white pine
SdC: Seward	---	American cranberrybush	eastern redcedar; northern white-cedar; osageorange; Washington hawthorn	Austrian pine; Norway spruce; red pine	eastern white pine
SdD: Seward	---	American cranberrybush	eastern redcedar; northern white-cedar; osageorange; Washington hawthorn	Austrian pine; Norway spruce; red pine	eastern white pine
SeB: Seward	---	American cranberrybush	eastern redcedar; northern white-cedar; osageorange; Washington hawthorn	Austrian pine; Norway spruce; red pine	eastern white pine
SeC: Seward	---	American cranberrybush	eastern redcedar; northern white-cedar; osageorange; Washington hawthorn	Austrian pine; Norway spruce; red pine	eastern white pine
SfA: Shinrock Variant	American cranberrybush	Amur honeysuckle; Amur privet; southern arrowwood	Austrian pine; eastern redcedar; green ash; osageorange; Washington hawthorn	eastern white pine; pin oak	---
Sh: Shoals	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
Sm: Sloan	silky dogwood	American cranberrybush; baldcypress; European alder	Austrian pine; eastern redcedar; green ash; northern white-cedar; Washington hawthorn	Norway spruce; swamp white oak	pin oak
Sn: Sloan	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern white-cedar; Washington hawthorn; white fir	eastern white pine; Norway spruce	pin oak
So: Sloan	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern white-cedar; Washington hawthorn; white fir	eastern white pine; Norway spruce	pin oak

TABLE 15.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
SpB: Spinks	---	American cranberrybush	eastern redcedar; northern white-cedar; osageorange; Washington hawthorn	Austrian pine; Norway spruce; red pine	eastern white pine
SpC: Spinks	---	American cranberrybush	eastern redcedar; northern white-cedar; osageorange; Washington hawthorn	Austrian pine; Norway spruce; red pine	eastern white pine
SpD: Spinks	---	American cranberrybush	eastern redcedar; northern white-cedar; osageorange; Washington hawthorn	Austrian pine; Norway spruce; red pine	eastern white pine
TdA: Tedrow	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
TeA: Tedrow Variant	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
To: Toledo	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern white-cedar; Washington hawthorn; white fir	eastern white pine; Norway spruce	pin oak
Tt: Toledo	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern white-cedar; Washington hawthorn; white fir	eastern white pine; Norway spruce	pin oak
TuB2: Tuscola	---	American cranberrybush	eastern redcedar; northern white-cedar; osageorange; Washington hawthorn	Austrian pine; Norway spruce; red pine	eastern white pine
TuC2: Tuscola	---	American cranberrybush	eastern redcedar; northern white-cedar; osageorange; Washington hawthorn	Austrian pine; Norway spruce; red pine	eastern white pine
Ud: Udorthents	---	---	---	---	---
Ur: Urban land	---	---	---	---	---
VaA: Vaughnsville	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
W: Water	---	---	---	---	---
Wa: Wabasha	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern white-cedar; Washington hawthorn; white fir	eastern white pine; Norway spruce	pin oak
Wc: Warners	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern white-cedar; Washington hawthorn; white fir	eastern white pine; Norway spruce	pin oak

TABLE 15.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
Wf:					
Wauseon	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern white-cedar; Washington hawthorn; white fir	eastern white pine; Norway spruce	pin oak
Wg:					
Wauseon	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern white-cedar; Washington hawthorn; white fir	eastern white pine; Norway spruce	pin oak

TABLE 16.—RECREATION PART 1

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text on page 194 for further explanation of ratings in this table.)

Map symbol and soil name	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
Ad:						
Adrian	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Gravel content	1.00
	Gravel content	1.00	Content of organic matter	1.00	Depth to saturated zone	1.00
	Content of organic matter	1.00	Gravel content	1.00	Content of organic matter	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
ArB:						
Arkport	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Too sandy	1.00
					Slope	0.50
ArC:						
Arkport	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Slope	1.00
	Slope	0.16	Slope	0.16	Too sandy	1.00
AsA:						
Aurand	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.99	Depth to saturated zone	1.00
	Restricted permeability	0.43	Restricted permeability	0.43	Restricted permeability	0.43
AtA:						
Aurand	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.99	Depth to saturated zone	1.00
	Restricted permeability	0.43	Restricted permeability	0.43	Restricted permeability	0.43
BcA:						
Bixler	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.58	Too sandy	0.58	Too sandy	0.58
Ca:						
Clay Pits	Not rated		Not rated		Not rated	
Ch:						
Cohoctah	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Flooding	1.00	Too sandy	0.01	Flooding	0.60
	Too sandy	0.01			Too sandy	0.01
Ck:						
Colwood	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00

Table 16.—Recreation Part 1--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
Cm:						
Colwood	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Cn:						
Colwood	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
Co:						
Colwood	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Cu:						
Cut And Fill Land	Not rated		Not rated		Not rated	
DeA:						
Del Rey	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
DfA:						
Del Rey	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
DuA:						
Digby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too sandy	0.01	Too sandy	0.01	Too sandy	0.01
DyA:						
Digby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
DzA:						
Digby	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.87	Depth to saturated zone	0.50	Depth to saturated zone	0.87
Ee:						
Eel	Very limited		Somewhat limited		Very limited	
	Flooding	1.00	Depth to saturated zone	0.46	Flooding	1.00
	Depth to saturated zone	0.83	Flooding	0.40	Depth to saturated zone	0.83

Table 16.—Recreation Part 1--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
FsA:						
Fulton	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.99	Restricted permeability	0.99	Restricted permeability	0.99
FsB:						
Fulton	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.99	Restricted permeability	0.99	Restricted permeability	0.99
					Slope	0.50
FuA:						
Fulton	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.99	Restricted permeability	0.99	Restricted permeability	0.99
FuB:						
Fulton	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
					Slope	0.50
FvA:						
Fulton Variant	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
GaA:						
Galen	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.98	Too sandy	0.98	Too sandy	0.98
GaB:						
Galen	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.98	Too sandy	0.98	Too sandy	0.98
					Slope	0.50
GbB:						
Galen	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.83	Too sandy	0.57	Depth to saturated zone	0.83
	Too sandy	0.57	Depth to saturated zone	0.46	Too sandy	0.57
					Slope	0.50
Gm:						
Genesee	Very limited		Not limited		Somewhat limited	
	Flooding	1.00			Flooding	0.60
Go:						
Gilford	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00

Table 16.—Recreation Part 1--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
Gr:						
Granby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Too sandy	0.72	Too sandy	0.72	Too sandy	0.72
Gv:						
Gravel Pits	Not rated		Not rated		Not rated	
HaA:						
Haney	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.83	Depth to saturated zone	0.46	Depth to saturated zone	0.83
	Too sandy	0.01	Too sandy	0.01	Too sandy	0.01
HaB:						
Haney	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.83	Depth to saturated zone	0.46	Depth to saturated zone	0.83
	Too sandy	0.01	Too sandy	0.01	Slope	0.50
					Too sandy	0.01
HdA:						
Haney	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.83	Depth to saturated zone	0.46	Depth to saturated zone	0.83
HdB:						
Haney	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.83	Depth to saturated zone	0.46	Depth to saturated zone	0.83
					Slope	0.50
HeC:						
Haney	Somewhat limited		Somewhat limited		Very limited	
	Depth to saturated zone	0.83	Depth to saturated zone	0.46	Slope	1.00
	Slope	0.16	Slope	0.16	Depth to saturated zone	0.83
Rawson	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Slope	1.00
	Slope	0.16	Slope	0.16	Restricted permeability	1.00
HkA:						
Haskins	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
HlA:						
Haskins	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00

Table 16.—Recreation Part 1--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
HlB:						
Haskins	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
					Slope	0.50
HnA:						
Haskins	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
Ho:						
Hoytville	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
Hp:						
Hoytville	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
Hr:						
Hoytville	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
Hs:						
Hoytville	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
Hv:						
Hoytville	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96

Table 16.—Recreation Part 1--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
Hw:						
Hoytville Variant---	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
KeA:						
Kibbie--------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too sandy	0.76	Too sandy	0.76	Too sandy	0.76
KfA:						
Kibbie--------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
KlA:						
Kibbie--------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
La:						
Latty---------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
Lb:						
Latty---------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
Le:						
Lenawee-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
Lf:						
Lenawee-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21

Table 16.—Recreation Part 1--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
LwB2:						
Lucas	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.99	Restricted permeability	0.99	Restricted permeability	0.99
					Slope	0.50
LwC2:						
Lucas	Somewhat limited		Somewhat limited		Very limited	
	Restricted permeability	0.99	Restricted permeability	0.99	Slope	1.00
	Slope	0.16	Slope	0.16	Restricted permeability	0.99
LxC3:						
Lucas	Very limited		Very limited		Very limited	
	Too clayey	1.00	Too clayey	1.00	Slope	1.00
	Restricted permeability	0.99	Restricted permeability	0.99	Too clayey	1.00
	Slope	0.16	Slope	0.16	Restricted permeability	0.99
LxE3:						
Lucas	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
	Restricted permeability	0.99	Restricted permeability	0.99	Restricted permeability	0.99
Mb:						
Mermill	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.98	Restricted permeability	0.98	Restricted permeability	0.98
Aurand	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.99	Depth to saturated zone	1.00
	Restricted permeability	0.43	Restricted permeability	0.43	Restricted permeability	0.43
Mc:						
Mermill	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Md:						
Medway	Very limited		Not limited		Somewhat limited	
	Flooding	1.00			Flooding	0.60
Me:						
Mermill	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00

Table 16.—Recreation Part 1--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
Mf:						
Mermill	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Mg:						
Mermill	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Mh:						
Millgrove	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Mk:						
Millgrove	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
NaA:						
Nappanee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
NaB:						
Nappanee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
					Slope	0.50
NtA:						
Nappanee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
NtB:						
Nappanee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
					Slope	0.50
NtB2:						
Nappanee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
					Slope	0.50

Table 16.—Recreation Part 1--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
OaC:						
Oakville	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Too sandy	1.00
					Slope	1.00
ObB:						
Oakville	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Too sandy	1.00
					Slope	0.50
ObC:						
Oakville	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Slope	1.00
	Slope	0.16	Slope	0.16	Too sandy	1.00
OsB:						
Oshtemo	Not limited		Not limited		Somewhat limited	
					Slope	0.50
OtB:						
Ottokee	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Too sandy	1.00
					Slope	0.13
OuB:						
Ottokee	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Too sandy	1.00
					Slope	0.13
OzB:						
Ottokee	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.31	Too sandy	0.31	Too sandy	0.31
					Slope	0.13
Spinks	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.86	Too sandy	0.86	Too sandy	0.86
					Slope	0.13
Pa:						
Paulding	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Pt:						
Pits, Quarry	Not rated		Not rated		Not rated	
RaB:						
Rawson	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
					Slope	0.50

Table 16.—Recreation Part 1--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
RdB:						
Rawson	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
					Slope	0.50
ReB:						
Rawson	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.21	Restricted permeability	0.21	Slope	0.50
					Restricted permeability	0.21
RfA:						
Rimer	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Too sandy	0.66	Too sandy	0.66	Too sandy	0.66
RgA:						
Rimer	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.98	Restricted permeability	0.98	Restricted permeability	0.98
	Depth to saturated zone	0.87	Too sandy	0.66	Depth to saturated zone	0.87
	Too sandy	0.66	Depth to saturated zone	0.50	Too sandy	0.66
RhB:						
Rimer	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.98	Restricted permeability	0.98	Restricted permeability	0.98
	Too sandy	0.66	Too sandy	0.66	Too sandy	0.66
					Slope	0.13
Tedrow	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.98	Restricted permeability	0.98	Restricted permeability	0.98
	Too sandy	0.31	Too sandy	0.31	Too sandy	0.31
					Slope	0.13
RmA:						
Rimer	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
	Too sandy	0.58	Too sandy	0.58	Too sandy	0.58
RoA:						
Roselms	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00

Table 16.—Recreation Part 1--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
RrA:						
Roselms	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
Rs:						
Ross	Very limited		Not limited		Somewhat limited	
	Flooding	1.00			Flooding	0.60
					Gravel content	0.06
SaE3:						
St. Clair	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
	Restricted permeability	0.99	Restricted permeability	0.99	Restricted permeability	0.99
SbB2:						
St. Clair	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.83	Depth to saturated zone	0.46	Depth to saturated zone	0.83
					Slope	0.50
SbC2:						
St. Clair	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Slope	1.00
	Depth to saturated zone	0.83	Depth to saturated zone	0.46	Restricted permeability	1.00
	Slope	0.16	Slope	0.16	Depth to saturated zone	0.83
SbD2:						
St. Clair	Somewhat limited		Somewhat limited		Very limited	
	Restricted permeability	0.96	Restricted permeability	0.96	Slope	1.00
	Slope	0.88	Slope	0.88	Restricted permeability	0.96
	Depth to saturated zone	0.10	Depth to saturated zone	0.05	Depth to saturated zone	0.10
SbE2:						
St. Clair	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
	Depth to saturated zone	0.10	Depth to saturated zone	0.05	Depth to saturated zone	0.10
ScC3:						
St. Clair	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Slope	1.00
	Too clayey	1.00	Too clayey	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.83	Depth to saturated zone	0.46	Too clayey	1.00
	Slope	0.16	Slope	0.16	Depth to saturated zone	0.83

Table 16.—Recreation Part 1--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
ScD3:						
St. Clair	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Slope	1.00
	Too clayey	1.00	Too clayey	1.00	Restricted permeability	1.00
	Slope	0.99	Slope	0.99	Too clayey	1.00
	Depth to saturated zone	0.83	Depth to saturated zone	0.46	Depth to saturated zone	0.83
ScE3:						
St. Clair	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
	Depth to saturated zone	0.83	Depth to saturated zone	0.46	Depth to saturated zone	0.83
ScF3:						
St. Clair	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
	Depth to saturated zone	0.83	Depth to saturated zone	0.46	Depth to saturated zone	0.83
SdB:						
Seward	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.99	Restricted permeability	0.99	Restricted permeability	0.99
	Too sandy	0.66	Too sandy	0.66	Too sandy	0.66
					Slope	0.50
SdC:						
Seward	Somewhat limited		Somewhat limited		Very limited	
	Restricted permeability	0.99	Restricted permeability	0.99	Slope	1.00
	Too sandy	0.66	Too sandy	0.66	Restricted permeability	0.99
	Slope	0.16	Slope	0.16	Too sandy	0.66
SdD:						
Seward	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.99	Slope	0.99	Slope	1.00
	Restricted permeability	0.99	Restricted permeability	0.99	Restricted permeability	0.99
	Too sandy	0.66	Too sandy	0.66	Too sandy	0.66
SeB:						
Seward	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Too sandy	0.66	Too sandy	0.66	Too sandy	0.66
					Slope	0.50

Table 16.—Recreation Part 1--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
SeC:						
Seward	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Slope	1.00
	Too sandy	0.66	Too sandy	0.66	Restricted permeability	1.00
	Slope	0.16	Slope	0.16	Too sandy	0.66
SfA:						
Shinrock Variant	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.83	Depth to saturated zone	0.46	Depth to saturated zone	0.83
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
Sh:						
Shoals	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Flooding	1.00	Flooding	0.40	Flooding	1.00
Sm:						
Sloan	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Flooding	1.00	Ponding	1.00	Flooding	1.00
	Ponding	1.00	Flooding	0.40	Ponding	1.00
Sn:						
Sloan	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Flooding	1.00			Flooding	0.60
So:						
Sloan	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Flooding	1.00	Flooding	0.40	Flooding	1.00
SpB:						
Spinks	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Too sandy	1.00
					Slope	0.50
SpC:						
Spinks	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Slope	1.00
	Slope	0.16	Slope	0.16	Too sandy	1.00
SpD:						
Spinks	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Slope	1.00
	Slope	0.99	Slope	0.99	Too sandy	1.00
TdA:						
Tedrow	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too sandy	0.31	Too sandy	0.31	Too sandy	0.31

Table 16.—Recreation Part 1--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
TeA:						
Tedrow Variant	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too sandy	0.31	Too sandy	0.31	Too sandy	0.31
To:						
Toledo	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
Tt:						
Toledo	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
TuB2:						
Tuscola	Not limited		Not limited		Somewhat limited	
					Slope	0.50
TuC2:						
Tuscola	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.16	Slope	0.16	Slope	1.00
Ud:						
Udorthents	Not rated		Not rated		Not rated	
Ur:						
Urban Land	Not rated		Not rated		Not rated	
VaA:						
Vaughnsville	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
W:						
Water	Not rated		Not rated		Not rated	
Wa:						
Wabasha	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Flooding	1.00	Too clayey	1.00	Flooding	1.00
	Too clayey	1.00	Restricted permeability	0.96	Too clayey	1.00
	Restricted permeability	0.96	Flooding	0.40	Restricted permeability	0.96
Wc:						
Warners	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Gravel content	1.00
	Gravel content	1.00	Gravel content	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96

Table 16.—Recreation Part 1--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
Wf:						
Wauseon-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Too sandy	0.01	Too sandy	0.01	Too sandy	0.01
Wg:						
Wauseon-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Too sandy	0.88	Too sandy	0.88	Too sandy	0.88

TABLE 17.—RECREATION PART 2

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text on page 194 for further explanation of ratings in this table.)

Map symbol and soil name	Paths and trails		Off-road motorcycle trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ad:						
Adrian	Very limited		Very limited		Very limited	
	Gravel content	1.00	Gravel content	1.00	Content of organic matter	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Gravel content	1.00
	Content of organic matter	1.00	Content of organic matter	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
ArB:						
Arkport	Very limited		Very limited		Somewhat limited	
	Too sandy	1.00	Too sandy	1.00	Droughty	0.74
ArC:						
Arkport	Very limited		Very limited		Somewhat limited	
	Too sandy	1.00	Too sandy	1.00	Slope	0.04
AsA:						
Aurand	Very limited		Very limited		Very limited	
	Depth to saturated zone	0.99	Depth to saturated zone	0.99	Depth to saturated zone	0.99
AtA:						
Aurand	Very limited		Very limited		Very limited	
	Depth to saturated zone	0.99	Depth to saturated zone	0.99	Depth to saturated zone	0.99
BcA:						
Bixler	Somewhat limited		Not limited		Not limited	
	Too sandy	0.58				
Ca:						
Clay Pits	Not rated		Not rated		Not rated	
Ch:						
Cohoctah	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too sandy	0.01			Flooding	0.60
					Droughty	0.10
Ck:						
Colwood	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Cm:						
Colwood	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00

Table 17.—Recreation Part 2--Continued

Map symbol and soil name	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
Cn:						
Colwood	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Co:						
Colwood	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Cu:						
Cut And Fill Land	Not rated		Not rated		Not rated	
DeA:						
Del Rey	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
DfA:						
Del Rey	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
DuA:						
Digby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too sandy	0.01				
DyA:						
Digby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
DzA:						
Digby	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.11	Depth to saturated zone	0.11	Depth to saturated zone	0.48
Ee:						
Eel	Somewhat limited		Somewhat limited		Very limited	
	Flooding	0.40	Flooding	0.40	Flooding	1.00
	Depth to saturated zone	0.08	Depth to saturated zone	0.08	Depth to saturated zone	0.43
FsA:						
Fulton	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
FsB:						
Fulton	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
FuA:						
Fulton	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00

Table 17.—Recreation Part 2--Continued

Map symbol and soil name	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
FuB:						
Fulton	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
FvA:						
Fulton Variant	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
GaA:						
Galen	Somewhat limited		Very limited		Not limited	
	Too sandy	0.98	Too sandy	1.00		
GaB:						
Galen	Somewhat limited		Very limited		Not limited	
	Too sandy	0.98	Too sandy	1.00		
GbB:						
Galen	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.57	Depth to saturated zone	0.08	Depth to saturated zone	0.43
	Depth to saturated zone	0.08				
Gm:						
Genesee	Not limited		Not limited		Somewhat limited	
					Flooding	0.60
Go:						
Gilford	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Gr:						
Granby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Too sandy	1.00	Ponding	1.00
	Too sandy	0.72	Ponding	1.00	Droughty	0.83
Gv:						
Gravel Pits	Not rated		Not rated		Not rated	
HaA:						
Haney	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.08	Depth to saturated zone	0.08	Depth to saturated zone	0.43
	Too sandy	0.01				
HaB:						
Haney	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.08	Depth to saturated zone	0.08	Depth to saturated zone	0.43
	Too sandy	0.01				

Table 17.—Recreation Part 2--Continued

Map symbol and soil name	Paths and trails: Rating class and limiting features	Paths and trails: Value	Off-road motorcycle trails: Rating class and limiting features	Off-road motorcycle trails: Value	Golf fairways: Rating class and limiting features	Golf fairways: Value
HdA:						
Haney	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.08	Depth to saturated zone	0.08	Depth to saturated zone	0.43
HdB:						
Haney	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.08	Depth to saturated zone	0.08	Depth to saturated zone	0.43
HeC:						
Haney	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.08	Depth to saturated zone	0.08	Depth to saturated zone	0.43
					Slope	0.04
Rawson	Not limited		Not limited		Somewhat limited	
					Slope	0.04
HkA:						
Haskins	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
HlA:						
Haskins	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
HlB:						
Haskins	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
HnA:						
Haskins	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Ho:						
Hoytville	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Hp:						
Hoytville	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Hr:						
Hoytville	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Hs:						
Hoytville	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00

Table 17.—Recreation Part 2--Continued

Map symbol and soil name	Paths and trails		Off-road motorcycle trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Hv:						
Hoytville	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Hw:						
Hoytville Variant	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
KeA:						
Kibbie	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too sandy	0.76				
KfA:						
Kibbie	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
KlA:						
Kibbie	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
La:						
Latty	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Lb:						
Latty	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Le:						
Lenawee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Lf:						
Lenawee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00

Table 17.—Recreation Part 2--Continued

Map symbol and soil name	Paths and trails: Rating class and limiting features	Paths and trails: Value	Off-road motorcycle trails: Rating class and limiting features	Off-road motorcycle trails: Value	Golf fairways: Rating class and limiting features	Golf fairways: Value
LwB2:						
Lucas	Not limited		Not limited		Not limited	
LwC2:						
Lucas	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Slope	0.04
LxC3:						
Lucas	Very limited		Very limited		Very limited	
	Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
					Slope	0.04
LxE3:						
Lucas	Very limited		Very limited		Very limited	
	Slope	1.00	Too clayey	1.00	Slope	1.00
	Too clayey	1.00	Slope	0.43	Too clayey	1.00
Mb:						
Mermill	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Aurand	Very limited		Very limited		Very limited	
	Depth to saturated zone	0.99	Depth to saturated zone	0.99	Depth to saturated zone	0.99
Mc:						
Mermill	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Md:						
Medway	Not limited		Not limited		Somewhat limited	
					Flooding	0.60
Me:						
Mermill	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Mf:						
Mermill	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Mg:						
Mermill	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Mh:						
Millgrove	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00

Table 17.—Recreation Part 2--Continued

Map symbol and soil name	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
Mk:						
Millgrove	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
NaA:						
Nappanee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
NaB:						
Nappanee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
NtA:						
Nappanee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
NtB:						
Nappanee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
NtB2:						
Nappanee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
OaC:						
Oakville	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Droughty	1.00
ObB:						
Oakville	Very limited		Very limited		Somewhat limited	
	Too sandy	1.00	Too sandy	1.00	Droughty	0.67
ObC:						
Oakville	Very limited		Very limited		Somewhat limited	
	Too sandy	1.00	Too sandy	1.00	Droughty	0.37
					Slope	0.04
OsB:						
Oshtemo	Not limited		Not limited		Not limited	
OtB:						
Ottokee	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Droughty	1.00
OuB:						
Ottokee	Very limited		Very limited		Somewhat limited	
	Too sandy	1.00	Too sandy	1.00	Droughty	0.30
OzB:						
Ottokee	Somewhat limited		Not limited		Somewhat limited	
	Too sandy	0.31			Droughty	0.14
Spinks	Somewhat limited		Not limited		Somewhat limited	
	Too sandy	0.86			Droughty	0.30

Table 17.—Recreation Part 2--Continued

Map symbol and soil name	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
Pa:						
Paulding------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Pt:						
Pits, Quarry--------	Not rated		Not rated		Not rated	
RaB:						
Rawson--------------	Not limited		Not limited		Not limited	
RdB:						
Rawson--------------	Not limited		Not limited		Not limited	
ReB:						
Rawson--------------	Not limited		Not limited		Not limited	
RfA:						
Rimer---------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too sandy	0.66	Too sandy	1.00	Droughty	0.50
RgA:						
Rimer---------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.66	Depth to saturated zone	0.11	Depth to saturated zone	0.48
	Depth to saturated zone	0.11				
RhB:						
Rimer---------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too sandy	0.66			Droughty	0.08
Tedrow--------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too sandy	0.31			Droughty	0.07
RmA:						
Rimer---------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too sandy	0.58	Too sandy	1.00	Droughty	0.03
RoA:						
Roselms-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
RrA:						
Roselms-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00	Too clayey	1.00	Too clayey	1.00

Table 17.—Recreation Part 2--Continued

Map symbol and soil name	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
Rs:						
Ross	Not limited		Not limited		Somewhat limited	
					Flooding	0.60
SaE3:						
St. Clair	Very limited		Very limited		Very limited	
	Slope	1.00	Too clayey	1.00	Slope	1.00
	Too clayey	1.00	Slope	0.28	Too clayey	1.00
SbB2:						
St. Clair	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.08	Depth to saturated zone	0.08	Depth to saturated zone	0.43
SbC2:						
St. Clair	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	0.43
	Depth to saturated zone	0.08	Depth to saturated zone	0.08	Slope	0.04
SbD2:						
St. Clair	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Slope	0.96
	Slope	0.05			Depth to saturated zone	0.03
SbE2:						
St. Clair	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	0.70			Depth to saturated zone	0.03
ScC3:						
St. Clair	Very limited		Very limited		Very limited	
	Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
	Depth to saturated zone	0.08	Depth to saturated zone	0.08	Depth to saturated zone	0.43
					Slope	0.04
ScD3:						
St. Clair	Very limited		Very limited		Very limited	
	Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
	Slope	0.11	Depth to saturated zone	0.08	Slope	0.99
	Depth to saturated zone	0.08			Depth to saturated zone	0.43
ScE3:						
St. Clair	Very limited		Very limited		Very limited	
	Too clayey	1.00	Too clayey	1.00	Slope	1.00
	Slope	0.89	Depth to saturated zone	0.08	Too clayey	1.00
	Depth to saturated zone	0.08			Depth to saturated zone	0.43
ScF3:						
St. Clair	Very limited		Very limited		Very limited	
	Slope	1.00	Too clayey	1.00	Slope	1.00
	Too clayey	1.00	Slope	0.80	Too clayey	1.00
	Depth to saturated zone	0.08	Depth to saturated zone	0.08	Depth to saturated zone	0.43

Table 17.—Recreation Part 2--Continued

Map symbol and soil name	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
SdB:						
Seward	Somewhat limited		Very limited		Somewhat limited	
	Too sandy	0.66	Too sandy	1.00	Droughty	0.46
SdC:						
Seward	Somewhat limited		Very limited		Somewhat limited	
	Too sandy	0.66	Too sandy	1.00	Droughty	0.46
					Slope	0.04
SdD:						
Seward	Somewhat limited		Very limited		Very limited	
	Too sandy	0.66	Too sandy	1.00	Slope	0.99
	Slope	0.11			Droughty	0.46
SeB:						
Seward	Somewhat limited		Very limited		Somewhat limited	
	Too sandy	0.66	Too sandy	1.00	Droughty	0.03
SeC:						
Seward	Somewhat limited		Very limited		Somewhat limited	
	Too sandy	0.66	Too sandy	1.00	Slope	0.04
					Droughty	0.03
SfA:						
Shinrock Variant	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.08	Depth to saturated zone	0.08	Depth to saturated zone	0.43
Sh:						
Shoals	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
	Flooding	0.40	Flooding	0.40	Depth to saturated zone	1.00
Sm:						
Sloan	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
	Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
	Flooding	0.40	Flooding	0.40	Ponding	1.00
Sn:						
Sloan	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
					Flooding	0.60
So:						
Sloan	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
	Flooding	0.40	Flooding	0.40	Depth to saturated zone	1.00

Table 17.—Recreation Part 2--Continued

Map symbol and soil name	Paths and trails: Rating class and limiting features	Paths and trails: Value	Off-road motorcycle trails: Rating class and limiting features	Off-road motorcycle trails: Value	Golf fairways: Rating class and limiting features	Golf fairways: Value
SpB:						
Spinks	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Droughty	1.00
SpC:						
Spinks	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Droughty	1.00
					Slope	0.04
SpD:						
Spinks	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Droughty	1.00
	Slope	0.11			Slope	0.99
TdA:						
Tedrow	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too sandy	0.31			Droughty	0.73
TeA:						
Tedrow Variant	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too sandy	0.31			Droughty	0.13
To:						
Toledo	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Tt:						
Toledo	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
TuB2:						
Tuscola	Not limited		Not limited		Not limited	
TuC2:						
Tuscola	Not limited		Not limited		Somewhat limited	
					Slope	0.04
Ud:						
Udorthents	Not rated		Not rated		Not rated	
Ur:						
Urban Land	Not rated		Not rated		Not rated	
VaA:						
Vaughnsville	Not limited		Not limited		Not limited	
W:						
Water	Not rated		Not rated		Not rated	
Wa:						
Wabasha	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
	Too clayey	1.00	Too clayey	1.00	Depth to saturated zone	1.00
	Flooding	0.40	Flooding	0.40	Too clayey	1.00

Table 17.—Recreation Part 2--Continued

Map symbol and soil name	Paths and trails		Off-road motorcycle trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Wc:						
Warners	Very limited		Very limited		Very limited	
	Gravel content	1.00	Gravel content	1.00	Gravel content	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Wf:						
Wauseon	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Too sandy	0.01				
Wg:						
Wauseon	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Too sandy	1.00	Ponding	1.00
	Too sandy	0.88	Ponding	1.00		

TABLE 18.--WILDLIFE HABITAT

(See text on page 195 for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
Ad: Adrian	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
ArB: Arkport	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
ArC: Arkport	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
AsA: Aurand	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
AtA: Aurand	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
BcA: Bixler	Poor	Fair	Good	Good	Good	Fair	Fair	Fair	Good	Fair.
Ca: Clay pits	---	---	---	---	---	---	---	---	---	---
Ch: Cohoctah	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good.
Ck: Colwood	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Cm: Colwood	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Cn: Colwood	Poor	Poor	Fair	Fair	Fair	Good	Good	Poor	Fair	Good.
Co: Colwood	Poor	Poor	Fair	Fair	Fair	Good	Good	Poor	Fair	Good.
Cu: Cut and fill land	---	---	---	---	---	---	---	---	---	---
DeA: Del Rey	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
DfA: Del Rey	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
DuA: Digby	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
DyA: Digby	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
DzA: Digby	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Ee: Eel	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
FsA: Fulton	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
FsB: Fulton	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

Table 18.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
FuA: Fulton	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
FuB: Fulton	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
FvA: Fulton Variant	Fair	Fair	Good	Fair	Fair	Fair	Fair	Fair	Fair	Fair.
GaA: Galen	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
GaB: Galen	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
GbB: Galen	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Gm: Genesee	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Go: Gilford	Fair	Poor	Poor	Poor	Poor	Good	Good	Fair	Poor	Good.
Gr: Granby	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Gv: Gravel pits	---	---	---	---	---	---	---	---	---	---
HaA: Haney	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
HaB: Haney	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
HdA: Haney	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
HdB: Haney	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
HeC: Haney	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Rawson	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
HkA: Haskins	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
HlA: Haskins	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
HlB: Haskins	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
HnA: Haskins	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Ho: Hoytville	Fair	Fair	Poor	Poor	Poor	Good	Good	Fair	Poor	Good.

Table 18.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
Hp: Hoytville	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Hr: Hoytville	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Hs: Hoytville	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Hv: Hoytville	Fair	Fair	Poor	Poor	Poor	Good	Good	Fair	Poor	Good.
Hw: Hoytville Variant	Poor	Fair	Poor	Poor	Poor	Poor	Good	Poor	Poor	Fair.
KeA: Kibbie	Poor	Fair	Good	Good	Good	Fair	Fair	Fair	Good	Fair.
KfA: Kibbie	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
KlA: Kibbie	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
La: Latty	Fair	Fair	Fair	Poor	Poor	Good	Good	Fair	Poor	Good.
Lb: Latty	Fair	Fair	Fair	Poor	Poor	Good	Good	Fair	Poor	Good.
Le: Lenawee	Poor	Poor	Fair	Fair	Fair	Good	Good	Poor	Fair	Good.
Lf: Lenawee	Poor	Poor	Fair	Fair	Fair	Good	Good	Poor	Fair	Good.
LwB2: Lucas	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
LwC2: Lucas	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
LxC3: Lucas	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
LxE3: Lucas	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Mb: Mermill	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Aurand	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Mc: Mermill	Good	Good	Good	Good	Fair	Good	Good	Good	Good	Good.
Md: Medway	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Me: Mermill	Good	Good	Good	Good	Fair	Good	Good	Good	Good	Good.
Mf: Mermill	Good	Good	Good	Good	Fair	Good	Good	Good	Good	Good.

Table 18.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
Mg: Mermill	Good	Good	Good	Good	Fair	Good	Good	Good	Good	Good.
Mh: Millgrove	Fair	Fair	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Mk: Millgrove	Fair	Fair	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
NaA: Nappanee	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
NaB: Nappanee	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
NtA: Nappanee	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
NtB: Nappanee	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
NtB2: Nappanee	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
OaC: Oakville	Poor	Poor	Fair	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
ObB: Oakville	Poor	Poor	Fair	Fair	Fair	Poor	Very poor.	Poor	Fair	Very poor.
ObC: Oakville	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
OsB: Oshtemo	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
OtB: Ottokee	Poor	Fair	Good	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.
OuB: Ottokee	Poor	Fair	Good	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.
OzB: Ottokee	Poor	Fair	Good	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.
Spinks	Poor	Fair	Fair	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.
Pa: Paulding	Fair	Fair	Poor	Poor	Poor	Good	Good	Fair	Poor	Good.
Pt: Pits, quarry	---	---	---	---	---	---	---	---	---	---
RaB: Rawson	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
RdB: Rawson	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

Table 18.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
ReB: Rawson	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
RfA: Rimer	Poor	Fair	Good	Good	Good	Fair	Fair	Fair	Good	Fair.
RgA: Rimer	Poor	Fair	Good	Good	Good	Fair	Fair	Fair	Good	Fair.
RhB: Rimer	Poor	Fair	Good	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.
Tedrow	Poor	Fair	Good	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.
RmA: Rimer	Poor	Fair	Good	Good	Good	Fair	Fair	Fair	Good	Fair.
RoA: Roselms	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
RrA: Roselms	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
Rs: Ross	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
SaE3: St. Clair	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
SbB2: St. Clair	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
SbC2: St. Clair	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
SbD2: St. Clair	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
SbE2: St. Clair	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
ScC3: St. Clair	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
ScD3: St. Clair	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
ScE3: St. Clair	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
ScF3: St. Clair	Very poor.	Very poor.	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
SdB: Seward	Poor	Fair	Good	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.

Table 18.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
SdC: Seward	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
SdD: Seward	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
SeB: Seward	Poor	Fair	Good	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.
SeC: Seward	Poor	Fair	Good	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.
SfA: Shinrock Variant	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Sh: Shoals	Poor	Fair	Fair	Good	Good	Fair	Fair	Fair	Good	Fair.
Sm: Sloan	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Sn: Sloan	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
So: Sloan	Fair	Fair	Fair	Poor	Poor	Good	Good	Fair	Poor	Good.
SpB: Spinks	Fair	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
SpC: Spinks	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
SpD: Spinks	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
TdA: Tedrow	Poor	Fair	Good	Fair	Fair	Fair	Fair	Fair	Fair	Fair.
TeA: Tedrow Variant	Poor	Fair	Good	Fair	Fair	Fair	Fair	Fair	Fair	Fair.
To: Toledo	Fair	Fair	Poor	Poor	Poor	Good	Good	Fair	Poor	Good.
Tt: Toledo	Fair	Fair	Poor	Poor	Poor	Good	Good	Fair	Poor	Good.
TuB2: Tuscola	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
TuC2: Tuscola	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Ud: Udorthents	---	---	---	---	---	---	---	---	---	---
Ur: Urban land	---	---	---	---	---	---	---	---	---	---

Table 18.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herba-ceous plants	Hardwood trees	Conif-erous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
VaA: Vaughnsville	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
W: Water	---	---	---	---	---	---	---	---	---	---
Wa: Wabasha	Poor	Poor	Fair	Good	Poor	Good	Good	Fair	Good	Good.
Wc: Warners	Fair	Fair	Poor	Poor	Poor	Good	Good	Fair	Poor	Good.
Wf: Wauseon	Fair	Fair	Poor	Poor	Poor	Good	Good	Fair	Poor	Good.
Wg: Wauseon	Fair	Fair	Poor	Poor	Poor	Good	Good	Fair	Poor	Good.

TABLE 19.--CONSTRUCTION MATERIALS PART 1

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text on page 197 for further explanation of ratings in this table.)

Map symbol and soil name	Potential source of gravel		Potential source of sand	
	Rating class	Value	Rating class	Value
Ad:				
Adrian	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
ArB:				
Arkport	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
ArC:				
Arkport	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
AsA:				
Aurand	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
AtA:				
Aurand	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
BcA:				
Bixler	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Ca:				
Clay Pits	Not rated		Not rated	
Ch:				
Cohoctah	Poor		Good	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	1.00
Ck:				
Colwood	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Cm:				
Colwood	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00

Table 19.--Construction Materials Part 1--Continued

Map symbol and soil name	Potential source of gravel: Rating class	Value	Potential source of sand: Rating class	Value
Cn:				
Colwood-------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Co:				
Colwood-------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Cu:				
Cut And Fill Land---	Not rated		Not rated	
DeA:				
Del Rey-------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
DfA:				
Del Rey-------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
DuA:				
Digby---------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
DyA:				
Digby---------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
DzA:				
Digby---------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Ee:				
Eel-----------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
FsA:				
Fulton--------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
FsB:				
Fulton--------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
FuA:				
Fulton--------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00

Table 19.--Construction Materials Part 1--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand	
	Rating class	Value	Rating class	Value
FuB:				
Fulton	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
FvA:				
Fulton Variant	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
GaA:				
Galen	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
GaB:				
Galen	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
GbB:				
Galen	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Gm:				
Genesee	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Go:				
Gilford	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Gr:				
Granby	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Gv:				
Gravel Pits	Not rated		Not rated	
HaA:				
Haney	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
HaB:				
Haney	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
HdA:				
Haney	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00

Table 19.--Construction Materials Part 1--Continued

Map symbol and soil name	Potential source of gravel: Rating class	Value	Potential source of sand: Rating class	Value
HdB:				
Haney---------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
HeC:				
Haney---------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Rawson--------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
HkA:				
Haskins-------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
HlA:				
Haskins-------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
HlB:				
Haskins-------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
HnA:				
Haskins-------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Ho:				
Hoytville-----------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Hp:				
Hoytville-----------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Hr:				
Hoytville-----------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Hs:				
Hoytville-----------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Hv:				
Hoytville-----------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00

Table 19.--Construction Materials Part 1--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand	
	Rating class	Value	Rating class	Value
Hw:				
Hoytville Variant---	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
KeA:				
Kibbie--------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
KfA:				
Kibbie--------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
KlA:				
Kibbie--------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
La:				
Latty---------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Lb:				
Latty---------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Le:				
Lenawee-------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Lf:				
Lenawee-------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
LwB2:				
Lucas---------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
LwC2:				
Lucas---------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
LxC3:				
Lucas---------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
LxE3:				
Lucas---------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00

Table 19.--Construction Materials Part 1--Continued

Map symbol and soil name	Potential source of gravel: Rating class	Value	Potential source of sand: Rating class	Value
Mb:				
Mermill	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Aurand	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Mc:				
Mermill	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Md:				
Medway	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Me:				
Mermill	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Mf:				
Mermill	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Mg:				
Mermill	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Mh:				
Millgrove	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Mk:				
Millgrove	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
NaA:				
Nappanee	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
NaB:				
Nappanee	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
NtA:				
Nappanee	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00

Table 19.--Construction Materials Part 1--Continued

Map symbol and soil name	Potential source of gravel: Rating class	Value	Potential source of sand: Rating class	Value
NtB:				
Nappanee	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
NtB2:				
Nappanee	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
OaC:				
Oakville	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
ObB:				
Oakville	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
ObC:				
Oakville	Poor		Good	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	1.00
OsB:				
Oshtemo	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
OtB:				
Ottokee	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
OuB:				
Ottokee	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
OzB:				
Ottokee	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Spinks	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Pa:				
Paulding	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Pt:				
Pits, Quarry	Not rated		Not rated	

Table 19.--Construction Materials Part 1--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand	
	Rating class	Value	Rating class	Value
RaB:				
Rawson	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
RdB:				
Rawson	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
ReB:				
Rawson	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
RfA:				
Rimer	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
RgA:				
Rimer	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
RhB:				
Rimer	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Tedrow	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
RmA:				
Rimer	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
RoA:				
Roselms	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
RrA:				
Roselms	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Rs:				
Ross	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
SaE3:				
St. Clair	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00

Table 19.--Construction Materials Part 1--Continued

Map symbol and soil name	Potential source of gravel: Rating class	Value	Potential source of sand: Rating class	Value
SbB2:				
St. Clair-----------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
SbC2:				
St. Clair-----------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
SbD2:				
St. Clair-----------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
SbE2:				
St. Clair-----------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
ScC3:				
St. Clair-----------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
ScD3:				
St. Clair-----------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
ScE3:				
St. Clair-----------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
ScF3:				
St. Clair-----------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
SdB:				
Seward--------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
SdC:				
Seward--------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
SdD:				
Seward--------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
SeB:				
Seward--------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00

Table 19.--Construction Materials Part 1--Continued

Map symbol and soil name	Potential source of gravel: Rating class	Value	Potential source of sand: Rating class	Value
SeC:				
Seward	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
SfA:				
Shinrock Variant	Poor		Good	
	Thickest layer	0.00	Bottom layer	1.00
	Bottom layer	0.00	Thickest layer	1.00
Sh:				
Shoals	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Sm:				
Sloan	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Sn:				
Sloan	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
So:				
Sloan	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
SpB:				
Spinks	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
SpC:				
Spinks	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
SpD:				
Spinks	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
TdA:				
Tedrow	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
TeA:				
Tedrow Variant	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
To:				
Toledo	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00

Table 19.--Construction Materials Part 1--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand	
	Rating class	Value	Rating class	Value
Tt:				
Toledo	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
TuB2:				
Tuscola	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
TuC2:				
Tuscola	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Ud:				
Udorthents	Not rated		Not rated	
Ur:				
Urban Land	Not rated		Not rated	
VaA:				
Vaughnsville	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
W:				
Water	Not rated		Not rated	
Wa:				
Wabasha	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Wc:				
Warners	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Wf:				
Wauseon	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Wg:				
Wauseon	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00

TABLE 20.--CONSTRUCTION MATERIALS PART 2

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text on page 197 for further explanation of ratings in this table.)

Map symbol and soil name	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ad:						
Adrian	Poor		Poor		Poor	
	Wind erosion	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Carbonate content	0.92			Rock fragments	0.00
					High organic matter content	0.00
ArB:						
Arkport	Poor		Good		Poor	
	Wind erosion	0.00			Too sandy	0.00
	Too sandy	0.00				
	Low content of organic matter	0.50				
	Droughty	0.99				
ArC:						
Arkport	Poor		Good		Fair	
	Wind erosion	0.00			Too sandy	0.92
	Low content of organic matter	0.50			Slope	0.96
	Too sandy	0.92				
AsA:						
Aurand	Fair		Poor		Poor	
	Low content of organic matter	0.12	Low strength	0.00	Depth to saturated zone	0.00
	Carbonate content	0.84	Depth to saturated zone	0.00	Rock fragments	0.88
					Hard to reclaim (dense layer)	0.99
AtA:						
Aurand	Fair		Poor		Poor	
	Carbonate content	0.84	Depth to saturated zone	0.00	Depth to saturated zone	0.00
			Low strength	0.22	Hard to reclaim (dense layer)	0.80
					Rock fragments	0.88
BcA:						
Bixler	Poor		Fair		Fair	
	Wind erosion	0.00	Depth to saturated zone	0.98	Depth to saturated zone	0.98
	Low content of organic matter	0.02	Shrink-swell	0.98		
	Water erosion	0.99				
Ca:						
Clay Pits	Not rated		Not rated		Not rated	

Table 20.--Construction Materials Part 2--Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
Ch:						
Cohoctah------------	Fair		Poor		Poor	
	Droughty	0.92	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Too sandy	0.99			Too sandy	0.99
Ck:						
Colwood-------------	Fair		Poor		Poor	
	Low content of organic matter	0.88	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Water erosion	0.90	Low strength	0.78		
Cm:						
Colwood-------------	Fair		Poor		Poor	
	Low content of organic matter	0.88	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Water erosion	0.90	Low strength	0.78		
Cn:						
Colwood-------------	Fair		Poor		Poor	
	Low content of organic matter	0.88	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Water erosion	0.90	Low strength	0.00		
			Shrink-swell	0.97		
Co:						
Colwood-------------	Fair		Poor		Poor	
	Low content of organic matter	0.88	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Water erosion	0.90	Low strength	0.00		
Cu:						
Cut And Fill Land---	Not rated		Not rated		Not rated	
DeA:						
Del Rey-------------	Fair		Poor		Poor	
	Too clayey	0.02	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.50	Low strength	0.00	Too clayey	0.01
	Carbonate content	0.80	Shrink-swell	0.87		
	Water erosion	0.90				
DfA:						
Del Rey-------------	Fair		Poor		Poor	
	Too clayey	0.02	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.50	Low strength	0.00	Too clayey	0.01
	Carbonate content	0.80	Shrink-swell	0.87		
	Water erosion	0.90				
DuA:						
Digby---------------	Fair		Poor		Poor	
	Carbonate content	0.80	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.88			Hard to reclaim (rock fragments)	0.32

Table 20.--Construction Materials Part 2--Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
DyA:						
Digby	Fair		Poor		Poor	
	Carbonate content	0.68	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.88			Hard to reclaim (rock fragments)	0.32
DzA:						
Digby	Fair		Fair		Poor	
	Low content of organic matter	0.08	Depth to saturated zone	0.29	Rock fragments	0.00
	Carbonate content	0.92			Depth to saturated zone	0.29
					Hard to reclaim (rock fragments)	0.68
Ee:						
Eel	Fair		Fair		Fair	
	Low content of organic matter	0.88	Depth to saturated zone	0.32	Depth to saturated zone	0.32
			Low strength	0.78		
FsA:						
Fulton	Poor		Poor		Poor	
	Too clayey	0.00	Depth to saturated zone	0.00	Too clayey	0.00
	Low content of organic matter	0.08	Low strength	0.00	Depth to saturated zone	0.00
	Water erosion	0.90	Shrink-swell	0.12		
	Carbonate content	0.92				
FsB:						
Fulton	Poor		Poor		Poor	
	Too clayey	0.00	Depth to saturated zone	0.00	Too clayey	0.00
	Low content of organic matter	0.08	Low strength	0.00	Depth to saturated zone	0.00
	Water erosion	0.90	Shrink-swell	0.12		
	Carbonate content	0.92				
FuA:						
Fulton	Poor		Poor		Poor	
	Too clayey	0.00	Depth to saturated zone	0.00	Too clayey	0.00
	Low content of organic matter	0.08	Low strength	0.00	Depth to saturated zone	0.00
	Water erosion	0.90	Shrink-swell	0.12		
	Carbonate content	0.92				
FuB:						
Fulton	Poor		Poor		Poor	
	Too clayey	0.00	Depth to saturated zone	0.00	Too clayey	0.00
	Low content of organic matter	0.08	Low strength	0.00	Depth to saturated zone	0.00
	Water erosion	0.90	Shrink-swell	0.12		
	Carbonate content	0.92				

Table 20.--Construction Materials Part 2--Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
FvA:						
Fulton Variant	Poor		Poor		Poor	
	Too clayey	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.88	Shrink-swell	0.88	Too clayey	0.00
					Hard to reclaim (rock fragments)	0.92
GaA:						
Galen	Poor		Fair		Poor	
	Too sandy	0.00	Depth to saturated zone	0.89	Too sandy	0.00
	Wind erosion	0.00			Depth to saturated zone	0.89
	Low content of organic matter	0.00				
GaB:						
Galen	Poor		Fair		Poor	
	Too sandy	0.00	Depth to saturated zone	0.89	Too sandy	0.00
	Wind erosion	0.00			Depth to saturated zone	0.89
	Low content of organic matter	0.00				
GbB:						
Galen	Poor		Fair		Poor	
	Too sandy	0.00	Depth to saturated zone	0.32	Too sandy	0.00
	Wind erosion	0.00			Depth to saturated zone	0.32
	Low content of organic matter	0.12				
Gm:						
Genesee	Fair		Good		Good	
	Low content of organic matter	0.68				
	Carbonate content	0.80				
	Water erosion	0.99				
Go:						
Gilford	Fair		Poor		Poor	
	Droughty	0.65	Depth to saturated zone	0.00	Depth to saturated zone	0.00
					Hard to reclaim (dense layer)	0.71
Gr:						
Granby	Poor		Poor		Poor	
	Wind erosion	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Droughty	0.03			Too sandy	0.06
	Too sandy	0.06				
	Low content of organic matter	0.12				
	Carbonate content	0.80				

Table 20.--Construction Materials Part 2--Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
Gv:						
Gravel Pits	Not rated		Not rated		Not rated	
HaA:						
Haney	Fair		Fair		Fair	
	Low content of organic matter	0.08	Depth to saturated zone	0.32	Depth to saturated zone	0.32
	Carbonate content	0.97				
HaB:						
Haney	Fair		Fair		Fair	
	Low content of organic matter	0.08	Depth to saturated zone	0.32	Depth to saturated zone	0.32
	Carbonate content	0.97				
HdA:						
Haney	Fair		Fair		Fair	
	Low content of organic matter	0.08	Depth to saturated zone	0.32	Depth to saturated zone	0.32
	Carbonate content	0.97				
HdB:						
Haney	Fair		Fair		Fair	
	Low content of organic matter	0.08	Depth to saturated zone	0.32	Depth to saturated zone	0.32
	Carbonate content	0.97				
HeC:						
Haney	Fair		Fair		Fair	
	Low content of organic matter	0.08	Depth to saturated zone	0.32	Depth to saturated zone	0.32
	Carbonate content	0.97			Slope	0.96
Rawson	Fair		Poor		Fair	
	Low content of organic matter	0.18	Low strength	0.00	Hard to reclaim (dense layer)	0.20
			Depth to saturated zone	0.89	Depth to saturated zone	0.89
			Shrink-swell	0.98	Too acid	0.95
					Slope	0.96
HkA:						
Haskins	Fair		Poor		Poor	
	Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Water erosion	0.99	Low strength	0.00		
			Shrink-swell	0.57		
HlA:						
Haskins	Fair		Poor		Poor	
	Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Water erosion	0.99	Low strength	0.00		
			Shrink-swell	0.57		

Table 20.--Construction Materials Part 2--Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
HlB:						
Haskins	Fair		Poor		Poor	
	Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Water erosion	0.99	Low strength	0.00		
			Shrink-swell	0.76		
HnA:						
Haskins	Fair		Poor		Poor	
	Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Water erosion	0.99	Low strength	0.00		
			Shrink-swell	0.83		
Ho:						
Hoytville	Poor		Poor		Poor	
	Too clayey	0.00	Depth to saturated zone	0.00	Too clayey	0.00
	Carbonate content	0.80	Low strength	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.88	Shrink-swell	0.12		
Hp:						
Hoytville	Poor		Poor		Poor	
	Too clayey	0.00	Depth to saturated zone	0.00	Too clayey	0.00
	Carbonate content	0.80	Low strength	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.88	Shrink-swell	0.87		
Hr:						
Hoytville	Poor		Poor		Poor	
	Too clayey	0.00	Depth to saturated zone	0.00	Too clayey	0.00
	Carbonate content	0.80	Low strength	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.88	Shrink-swell	0.87		
Hs:						
Hoytville	Poor		Poor		Poor	
	Too clayey	0.00	Depth to saturated zone	0.00	Too clayey	0.00
	Carbonate content	0.80	Low strength	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.88	Shrink-swell	0.87		
Hv:						
Hoytville	Poor		Poor		Poor	
	Too clayey	0.00	Depth to saturated zone	0.00	Too clayey	0.00
	Low content of organic matter	0.88	Low strength	0.00	Depth to saturated zone	0.00
	Carbonate content	0.92	Shrink-swell	0.12		

Table 20.--Construction Materials Part 2--Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
Hw:						
Hoytville Variant---	Poor		Poor		Poor	
	Too clayey	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.24	Low strength	0.00	Too clayey	0.00
	Droughty	0.51	Shrink-swell	0.12	Carbonate content	0.92
	Water erosion	0.90				
	Carbonate content	0.92				
KeA:						
Kibbie--------------	Poor		Poor		Poor	
	Wind erosion	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.12				
	Carbonate content	0.80				
KfA:						
Kibbie--------------	Fair		Poor		Poor	
	Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Carbonate content	0.80				
	Water erosion	0.90				
KlA:						
Kibbie--------------	Fair		Poor		Poor	
	Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Carbonate content	0.80				
	Water erosion	0.90				
La:						
Latty---------------	Poor		Poor		Poor	
	Too clayey	0.00	Depth to saturated zone	0.00	Too clayey	0.00
	Low content of organic matter	0.88	Low strength	0.00	Depth to saturated zone	0.00
	Carbonate content	0.97	Shrink-swell	0.12		
Lb:						
Latty---------------	Poor		Poor		Poor	
	Too clayey	0.00	Depth to saturated zone	0.00	Too clayey	0.00
	Carbonate content	0.84	Low strength	0.00	Depth to saturated zone	0.00
			Shrink-swell	0.12		
Le:						
Lenawee-------------	Fair		Poor		Poor	
	Too clayey	0.02	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Carbonate content	0.92	Low strength	0.00	Too clayey	0.02
	Water erosion	0.99	Shrink-swell	0.34		

Table 20.--Construction Materials Part 2--Continued

Map symbol and soil name	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Lf:						
Lenawee	Fair		Poor		Poor	
	Too clayey	0.02	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Carbonate content	0.92	Low strength	0.00	Too clayey	0.02
	Water erosion	0.99	Shrink-swell	0.34		
LwB2:						
Lucas	Poor		Poor		Poor	
	Too clayey	0.00	Low strength	0.00	Too clayey	0.00
	Low content of organic matter	0.08	Shrink-swell	0.12	Depth to saturated zone	0.89
	Water erosion	0.90	Depth to saturated zone	0.89		
	Carbonate content	0.92				
LwC2:						
Lucas	Poor		Poor		Poor	
	Too clayey	0.00	Low strength	0.00	Too clayey	0.00
	Low content of organic matter	0.08	Shrink-swell	0.12	Depth to saturated zone	0.89
	Water erosion	0.90	Depth to saturated zone	0.89	Slope	0.96
	Carbonate content	0.92				
LxC3:						
Lucas	Poor		Poor		Poor	
	Too clayey	0.00	Low strength	0.00	Too clayey	0.00
	Low content of organic matter	0.08	Shrink-swell	0.12	Depth to saturated zone	0.89
	Carbonate content	0.92	Depth to saturated zone	0.89	Slope	0.96
LxE3:						
Lucas	Poor		Poor		Poor	
	Too clayey	0.00	Low strength	0.00	Too clayey	0.00
	Low content of organic matter	0.08	Slope	0.00	Slope	0.00
	Carbonate content	0.92	Shrink-swell	0.12	Depth to saturated zone	0.89
			Depth to saturated zone	0.89		
Mb:						
Mermill	Fair		Poor		Poor	
	Carbonate content	0.84	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.88	Low strength	0.00		
Aurand	Fair		Poor		Poor	
	Low content of organic matter	0.12	Low strength	0.00	Depth to saturated zone	0.00
	Carbonate content	0.84	Depth to saturated zone	0.00	Hard to reclaim (dense layer)	0.46
					Rock fragments	0.97

Table 20.--Construction Materials Part 2--Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
Mc:						
Mermill	Fair		Poor		Poor	
	Low content of organic matter	0.18	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Carbonate content	0.97	Low strength	0.00		
	Water erosion	0.99	Shrink-swell	0.49		
Md:						
Medway	Fair		Poor		Fair	
	Low content of organic matter	0.88	Low strength	0.00	Depth to saturated zone	0.89
			Depth to saturated zone	0.89		
Me:						
Mermill	Fair		Poor		Poor	
	Low content of organic matter	0.88	Depth to saturated zone	0.00	Depth to saturated zone	0.00
			Shrink-swell	0.61		
Mf:						
Mermill	Fair		Poor		Poor	
	Low content of organic matter	0.88	Depth to saturated zone	0.00	Depth to saturated zone	0.00
			Shrink-swell	0.61		
Mg:						
Mermill	Fair		Poor		Poor	
	Low content of organic matter	0.88	Depth to saturated zone	0.00	Depth to saturated zone	0.00
			Shrink-swell	0.87		
Mh:						
Millgrove	Fair		Poor		Poor	
	Low content of organic matter	0.88	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Carbonate content	0.97	Low strength	0.22		
			Shrink-swell	0.99		
Mk:						
Millgrove	Fair		Poor		Poor	
	Low content of organic matter	0.88	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Carbonate content	0.97	Low strength	0.22		
			Shrink-swell	0.99		
NaA:						
Nappanee	Fair		Poor		Poor	
	Too clayey	0.02	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.12	Low strength	0.00	Too clayey	0.01
	Water erosion	0.99	Shrink-swell	0.89		

Table 20.--Construction Materials Part 2--Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
NaB:						
Nappanee	Fair		Poor		Poor	
	Too clayey	0.02	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.12	Low strength	0.00	Too clayey	0.01
	Water erosion	0.99	Shrink-swell	0.89		
NtA:						
Nappanee	Fair		Poor		Poor	
	Too clayey	0.02	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.12	Low strength	0.00	Too clayey	0.01
	Water erosion	0.90	Shrink-swell	0.87		
NtB:						
Nappanee	Fair		Poor		Poor	
	Too clayey	0.02	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.12	Low strength	0.00	Too clayey	0.01
	Water erosion	0.90	Shrink-swell	0.87		
NtB2:						
Nappanee	Fair		Poor		Poor	
	Too clayey	0.02	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.12	Low strength	0.00	Too clayey	0.01
	Water erosion	0.90	Shrink-swell	0.87		
OaC:						
Oakville	Poor		Good		Poor	
	Too sandy	0.00			Too sandy	0.00
	Wind erosion	0.00				
	Droughty	0.00				
	Low content of organic matter	0.12				
ObB:						
Oakville	Poor		Good		Poor	
	Too sandy	0.00			Too sandy	0.00
	Wind erosion	0.00				
	Low content of organic matter	0.12				
	Droughty	0.99				
ObC:						
Oakville	Poor		Good		Poor	
	Too sandy	0.00			Too sandy	0.00
	Wind erosion	0.00			Slope	0.96
	Low content of organic matter	0.12				
	Droughty	0.46				
OsB:						
Oshtemo	Fair		Good		Fair	
	Carbonate content	0.97			Hard to reclaim (rock fragments)	0.92

Table 20.--Construction Materials Part 2--Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
OtB:						
Ottokee	Poor		Fair		Poor	
	Too sandy	0.00	Depth to saturated zone	0.98	Too sandy	0.00
	Wind erosion	0.00			Depth to saturated zone	0.98
	Droughty	0.00				
OuB:						
Ottokee	Poor		Fair		Poor	
	Wind erosion	0.00	Depth to saturated zone	0.98	Too sandy	0.00
	Too sandy	0.00			Depth to saturated zone	0.98
	Low content of organic matter	0.88				
	Droughty	0.99				
OzB:						
Ottokee	Poor		Fair		Fair	
	Wind erosion	0.00	Depth to saturated zone	0.91	Too sandy	0.51
	Low content of organic matter	0.50			Depth to saturated zone	0.91
	Too sandy	0.51				
	Droughty	0.68				
Spinks	Poor		Good		Fair	
	Wind erosion	0.00			Too sandy	0.03
	Too sandy	0.03				
	Low content of organic matter	0.12				
	Droughty	0.62				
Pa:						
Paulding	Poor		Poor		Poor	
	Too clayey	0.00	Depth to saturated zone	0.00	Too clayey	0.00
	Low content of organic matter	0.88	Low strength	0.00	Depth to saturated zone	0.00
	Carbonate content	0.99	Shrink-swell	0.12		
Pt:						
Pits, Quarry	Not rated		Not rated		Not rated	
RaB:						
Rawson	Fair		Poor		Fair	
	Low content of organic matter	0.18	Low strength	0.00	Hard to reclaim (dense layer)	0.20
			Shrink-swell	0.38	Depth to saturated zone	0.89
			Depth to saturated zone	0.89		

Table 20.--Construction Materials Part 2--Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
RdB:						
Rawson	Fair		Poor		Fair	
	Low content of organic matter	0.18	Low strength	0.00	Hard to reclaim (dense layer)	0.20
			Shrink-swell	0.38	Depth to saturated zone	0.89
			Depth to saturated zone	0.89		
ReB:						
Rawson	Fair		Fair		Fair	
	Low content of organic matter	0.88	Shrink-swell	0.51	Depth to saturated zone	0.89
			Depth to saturated zone	0.89	Hard to reclaim (dense layer)	0.90
RfA:						
Rimer	Poor		Poor		Poor	
	Wind erosion	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.08	Low strength	0.00	Too sandy	0.09
	Too sandy	0.09	Shrink-swell	0.57		
	Droughty	0.87				
	Carbonate content	0.92				
RgA:						
Rimer	Poor		Poor		Poor	
	Wind erosion	0.00	Low strength	0.00	Too sandy	0.00
	Too sandy	0.00	Depth to saturated zone	0.29	Hard to reclaim (dense layer)	0.05
	Low content of organic matter	0.08	Shrink-swell	0.74	Depth to saturated zone	0.29
	Carbonate content	0.92				
RhB:						
Rimer	Poor		Poor		Poor	
	Wind erosion	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.12	Low strength	0.00	Too sandy	0.16
	Too sandy	0.16	Shrink-swell	0.99	Hard to reclaim (dense layer)	0.29
	Droughty	0.73				
	Carbonate content	0.92				
Tedrow	Poor		Poor		Poor	
	Too sandy	0.00	Depth to saturated zone	0.00	Too sandy	0.00
	Wind erosion	0.00	Low strength	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.12			Hard to reclaim (dense layer)	0.84
	Droughty	0.91				
	Carbonate content	0.92				

Table 20.--Construction Materials Part 2--Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
RmA:						
Rimer----------------	Poor		Poor		Poor	
	Wind erosion	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.08	Low strength	0.00	Too sandy	0.16
	Too sandy	0.16	Shrink-swell	0.99		
	Carbonate content	0.92				
RoA:						
Roselms--------------	Poor		Poor		Poor	
	Too clayey	0.00	Depth to saturated zone	0.00	Too clayey	0.00
	Low content of organic matter	0.18	Low strength	0.00	Depth to saturated zone	0.00
	Water erosion	0.90	Shrink-swell	0.12		
	Carbonate content	0.92				
RrA:						
Roselms--------------	Poor		Poor		Poor	
	Too clayey	0.00	Depth to saturated zone	0.00	Too clayey	0.00
	Low content of organic matter	0.18	Low strength	0.00	Depth to saturated zone	0.00
	Carbonate content	0.92	Shrink-swell	0.12	Carbonate content	0.92
Rs:						
Ross-----------------	Good		Fair		Fair	
			Low strength	0.22	Rock fragments	0.97
SaE3:						
St. Clair------------	Poor		Poor		Poor	
	Too clayey	0.00	Low strength	0.00	Slope	0.00
	Low content of organic matter	0.12	Slope	0.00	Too clayey	0.00
	Carbonate content	0.68	Shrink-swell	0.12	Depth to saturated zone	0.89
	Water erosion	0.99	Depth to saturated zone	0.89		
SbB2:						
St. Clair------------	Poor		Poor		Poor	
	Too clayey	0.00	Low strength	0.00	Too clayey	0.00
	Low content of organic matter	0.12	Shrink-swell	0.12	Depth to saturated zone	0.32
	Carbonate content	0.68	Depth to saturated zone	0.32		
	Water erosion	0.90				
SbC2:						
St. Clair------------	Poor		Poor		Poor	
	Too clayey	0.00	Low strength	0.00	Too clayey	0.00
	Low content of organic matter	0.12	Shrink-swell	0.12	Depth to saturated zone	0.32
	Carbonate content	0.68	Depth to saturated zone	0.32	Slope	0.96
	Water erosion	0.90				

Table 20.--Construction Materials Part 2--Continued

Map symbol and soil name	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SbD2:						
St. Clair-----------	Poor		Poor		Poor	
	Too clayey	0.00	Low strength	0.00	Too clayey	0.00
	Low content of organic matter	0.12	Depth to saturated zone	0.76	Slope	0.04
	Carbonate content	0.80	Shrink-swell	0.87	Depth to saturated zone	0.76
	Water erosion	0.90			Carbonate content	0.80
	Droughty	0.98			Rock fragments	0.97
SbE2:						
St. Clair-----------	Poor		Poor		Poor	
	Too clayey	0.00	Low strength	0.00	Slope	0.00
	Low content of organic matter	0.12	Slope	0.50	Too clayey	0.00
	Carbonate content	0.80	Depth to saturated zone	0.76	Depth to saturated zone	0.76
	Water erosion	0.90	Shrink-swell	0.87	Carbonate content	0.80
	Droughty	0.98			Rock fragments	0.97
ScC3:						
St. Clair-----------	Poor		Poor		Poor	
	Too clayey	0.00	Low strength	0.00	Too clayey	0.00
	Low content of organic matter	0.12	Shrink-swell	0.12	Depth to saturated zone	0.32
	Carbonate content	0.68	Depth to saturated zone	0.32	Slope	0.96
	Water erosion	0.99				
ScD3:						
St. Clair-----------	Poor		Poor		Poor	
	Too clayey	0.00	Low strength	0.00	Too clayey	0.00
	Low content of organic matter	0.12	Shrink-swell	0.12	Slope	0.00
	Carbonate content	0.68	Depth to saturated zone	0.32	Depth to saturated zone	0.32
	Water erosion	0.99				
ScE3:						
St. Clair-----------	Poor		Poor		Poor	
	Too clayey	0.00	Low strength	0.00	Slope	0.00
	Low content of organic matter	0.12	Shrink-swell	0.12	Too clayey	0.00
	Carbonate content	0.68	Slope	0.18	Depth to saturated zone	0.32
	Water erosion	0.99	Depth to saturated zone	0.32		
ScF3:						
St. Clair-----------	Poor		Poor		Poor	
	Too clayey	0.00	Slope	0.00	Slope	0.00
	Low content of organic matter	0.12	Low strength	0.00	Too clayey	0.00
	Carbonate content	0.68	Shrink-swell	0.12	Depth to saturated zone	0.32
	Water erosion	0.99	Depth to saturated zone	0.32		

Table 20.--Construction Materials Part 2--Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
SdB:						
Seward	Poor		Poor		Fair	
	Wind erosion	0.00	Low strength	0.00	Too sandy	0.09
	Too sandy	0.09	Shrink-swell	0.86	Hard to reclaim (dense layer)	0.84
	Droughty	0.40				
	Carbonate content	0.92				
SdC:						
Seward	Poor		Poor		Fair	
	Wind erosion	0.00	Low strength	0.00	Too sandy	0.09
	Too sandy	0.09	Shrink-swell	0.86	Hard to reclaim (dense layer)	0.84
	Droughty	0.40			Slope	0.96
	Carbonate content	0.92				
SdD:						
Seward	Poor		Poor		Poor	
	Wind erosion	0.00	Low strength	0.00	Slope	0.00
	Too sandy	0.09	Shrink-swell	0.86	Too sandy	0.09
	Droughty	0.40			Hard to reclaim (dense layer)	0.84
	Carbonate content	0.92				
SeB:						
Seward	Poor		Fair		Fair	
	Wind erosion	0.00	Shrink-swell	0.99	Too sandy	0.09
	Too sandy	0.09				
	Low content of organic matter	0.24				
	Carbonate content	0.92				
SeC:						
Seward	Poor		Fair		Fair	
	Wind erosion	0.00	Shrink-swell	0.99	Too sandy	0.09
	Too sandy	0.09			Slope	0.96
	Low content of organic matter	0.24				
	Carbonate content	0.92				
SfA:						
Shinrock Variant	Fair		Fair		Fair	
	Low content of organic matter	0.12	Depth to saturated zone	0.32	Depth to saturated zone	0.32
	Too clayey	0.50			Too clayey	0.36
	Water erosion	0.99				
Sh:						
Shoals	Fair		Poor		Poor	
	Low content of organic matter	0.88	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Water erosion	0.99				
Sm:						
Sloan	Fair		Poor		Poor	
	Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Carbonate content	0.92				

Table 20.--Construction Materials Part 2--Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
Sn:						
Sloan	Fair		Poor		Poor	
	Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Carbonate content	0.92	Low strength	0.78		
	Water erosion	0.99				
So:						
Sloan	Fair		Poor		Poor	
	Carbonate content	0.80	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.88	Low strength	0.00		
	Water erosion	0.99	Shrink-swell	0.98		
SpB:						
Spinks	Poor		Good		Poor	
	Too sandy	0.00			Too sandy	0.00
	Wind erosion	0.00				
	Droughty	0.08				
	Low content of organic matter	0.12				
SpC:						
Spinks	Poor		Good		Poor	
	Too sandy	0.00			Too sandy	0.00
	Wind erosion	0.00			Slope	0.96
	Droughty	0.08				
	Low content of organic matter	0.12				
SpD:						
Spinks	Poor		Good		Poor	
	Too sandy	0.00			Too sandy	0.00
	Wind erosion	0.00			Slope	0.00
	Droughty	0.08				
	Low content of organic matter	0.12				
TdA:						
Tedrow	Poor		Poor		Poor	
	Wind erosion	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Droughty	0.04			Too sandy	0.36
	Low content of organic matter	0.08				
	Too sandy	0.36				
TeA:						
Tedrow Variant	Poor		Poor		Poor	
	Wind erosion	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.18			Too sandy	0.36
	Too sandy	0.36				
	Droughty	0.89				

Table 20.--Construction Materials Part 2--Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
To:						
Toledo	Poor		Poor		Poor	
	Too clayey	0.00	Depth to saturated zone	0.00	Too clayey	0.00
	Low content of organic matter	0.18	Low strength	0.00	Depth to saturated zone	0.00
			Shrink-swell	0.12		
Tt:						
Toledo	Poor		Poor		Poor	
	Too clayey	0.00	Depth to saturated zone	0.00	Too clayey	0.00
	Low content of organic matter	0.12	Low strength	0.00	Depth to saturated zone	0.00
			Shrink-swell	0.12		
TuB2:						
Tuscola	Fair		Fair		Fair	
	Low content of organic matter	0.12	Depth to saturated zone	0.89	Depth to saturated zone	0.89
TuC2:						
Tuscola	Fair		Fair		Fair	
	Low content of organic matter	0.12	Depth to saturated zone	0.89	Depth to saturated zone	0.89
					Slope	0.96
Ud:						
Udorthents	Not rated		Not rated		Not rated	
Ur:						
Urban Land	Not rated		Not rated		Not rated	
VaA:						
Vaughnsville	Fair		Poor		Fair	
	Low content of organic matter	0.08	Low strength	0.00	Rock fragments	0.12
	Too clayey	0.82	Shrink-swell	0.76	Too clayey	0.59
			Depth to saturated zone	0.89	Depth to saturated zone	0.89
W:						
Water	Not rated		Not rated		Not rated	
Wa:						
Wabasha	Poor		Poor		Poor	
	Too clayey	0.00	Depth to saturated zone	0.00	Too clayey	0.00
	Low content of organic matter	0.88	Low strength	0.00	Depth to saturated zone	0.00
			Shrink-swell	0.20		

Table 20.--Construction Materials Part 2--Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
Wc:						
Warners-------------	Poor		Poor		Poor	
	Wind erosion	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Carbonate content	0.08			Carbonate content	0.08
	Water erosion	0.90				
Wf:						
Wauseon-------------	Fair		Poor		Poor	
	Carbonate content	0.92	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Too sandy	0.99	Low strength	0.00	Too sandy	0.99
			Shrink-swell	0.96		
Wg:						
Wauseon-------------	Poor		Poor		Poor	
	Wind erosion	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.18	Shrink-swell	0.97	Too sandy	0.50
	Too sandy	0.50				
	Carbonate content	0.92				

TABLE 21.--BUILDING SITE DEVELOPMENT PART 1

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text on page 198 for further explanation of ratings in this table.)

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
Ad:						
Adrian	Very limited		Very limited		Very limited	
	Subsidence	1.00	Subsidence	1.00	Subsidence	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
ArB:						
Arkport	Not limited		Not limited		Somewhat limited	
					Slope	0.10
ArC:						
Arkport	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.04	Slope	0.04	Slope	1.00
AsA:						
Aurand	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
			Shrink-swell	0.50		
AtA:						
Aurand	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
BcA:						
Bixler	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	0.99	Shrink-swell	0.50
			Shrink-swell	0.50		
Ca:						
Clay Pits	Not rated		Not rated		Not rated	
Ch:						
Cohoctah	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Ck:						
Colwood	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Cm:						
Colwood	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00

Table 21.--Building Site Development Part 1--Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
Cn:						
Colwood	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Co:						
Colwood	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Cu:						
Cut And Fill Land	Not rated		Not rated		Not rated	
DeA:						
Del Rey	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
DfA:						
Del Rey	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
DuA:						
Digby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
DyA:						
Digby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
DzA:						
Digby	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.87	Depth to saturated zone	1.00	Depth to saturated zone	0.87
Ee:						
Eel	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	0.83	Depth to saturated zone	1.00	Depth to saturated zone	0.83
FsA:						
Fulton	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
FsB:						
Fulton	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00

Table 21.--Building Site Development Part 1--Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
					Slope	0.10
FuA:						
Fulton	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
FuB:						
Fulton	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
					Slope	0.10
FvA:						
Fulton Variant	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	1.00			Shrink-swell	1.00
GaA:						
Galen	Not limited		Very limited		Not limited	
			Depth to saturated zone	0.99		
GaB:						
Galen	Not limited		Very limited		Somewhat limited	
			Depth to saturated zone	0.99	Slope	0.10
GbB:						
Galen	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.83	Depth to saturated zone	1.00	Depth to saturated zone	0.83
					Slope	0.10
Gm:						
Genesee	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Flooding	1.00
Go:						
Gilford	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Gr:						
Granby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Gv:						
Gravel Pits	Not rated		Not rated		Not rated	
HaA:						
Haney	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.83	Depth to saturated zone	1.00	Depth to saturated zone	0.83

Table 21.--Building Site Development Part 1--Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
HaB:						
Haney	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.83	Depth to saturated zone	1.00	Depth to saturated zone	0.83
					Slope	0.10
HdA:						
Haney	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.83	Depth to saturated zone	1.00	Depth to saturated zone	0.83
HdB:						
Haney	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.83	Depth to saturated zone	1.00	Depth to saturated zone	0.83
					Slope	0.10
HeC:						
Haney	Somewhat limited		Very limited		Very limited	
	Depth to saturated zone	0.83	Depth to saturated zone	1.00	Slope	1.00
	Slope	0.04	Slope	0.04	Depth to saturated zone	0.83
Rawson	Somewhat limited		Very limited		Very limited	
	Slope	0.04	Depth to saturated zone	0.99	Slope	1.00
			Shrink-swell	0.50		
			Slope	0.04		
HkA:						
Haskins	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
HlA:						
Haskins	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
HlB:						
Haskins	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
			Shrink-swell	1.00	Slope	0.10
HnA:						
Haskins	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
Ho:						
Hoytville	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00

Table 21.--Building Site Development Part 1--Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
Hp:						
Hoytville-----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Hr:						
Hoytville-----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Hs:						
Hoytville-----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Hv:						
Hoytville-----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Hw:						
Hoytville Variant---	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
KeA:						
Kibbie--------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
KfA:						
Kibbie--------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
KlA:						
Kibbie--------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
La:						
Latty---------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Lb:						
Latty---------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00

Table 21.--Building Site Development Part 1--Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Le:						
Lenawee----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Lf:						
Lenawee----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
LwB2:						
Lucas------------	Very limited		Very limited		Very limited	
	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
			Depth to saturated zone	0.99	Slope	0.10
LwC2:						
Lucas------------	Very limited		Very limited		Very limited	
	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
	Slope	0.04	Depth to saturated zone	0.99	Slope	1.00
			Slope	0.04		
LxC3:						
Lucas------------	Very limited		Very limited		Very limited	
	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
	Slope	0.04	Depth to saturated zone	0.99	Slope	1.00
			Slope	0.04		
LxE3:						
Lucas------------	Very limited		Very limited		Very limited	
	Shrink-swell	1.00	Shrink-swell	1.00	Slope	1.00
	Slope	1.00	Slope	1.00	Shrink-swell	1.00
			Depth to saturated zone	0.99		
Mb:						
Mermill----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Aurand-----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
			Shrink-swell	0.50		
Mc:						
Mermill----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Shrink-swell	1.00	Ponding	1.00

Table 21.--Building Site Development Part 1--Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
	Shrink-swell	0.50	Ponding	1.00	Shrink-swell	0.50
Md:						
Medway	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Flooding	1.00
			Depth to saturated zone	0.99		
Me:						
Mermill	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Mf:						
Mermill	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Mg:						
Mermill	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Mh:						
Millgrove	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Mk:						
Millgrove	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
NaA:						
Nappanee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
NaB:						
Nappanee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
					Slope	0.10
NtA:						
Nappanee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00

Table 21.--Building Site Development Part 1--Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
NtB:						
Nappanee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
					Slope	0.10
NtB2:						
Nappanee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
					Slope	0.10
OaC:						
Oakville	Not limited		Not limited		Somewhat limited	
					Slope	0.90
ObB:						
Oakville	Not limited		Not limited		Somewhat limited	
					Slope	0.10
ObC:						
Oakville	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.04	Slope	0.04	Slope	1.00
OsB:						
Oshtemo	Not limited		Not limited		Somewhat limited	
					Slope	0.10
OtB:						
Ottokee	Not limited		Somewhat limited		Not limited	
			Depth to saturated zone	0.99		
OuB:						
Ottokee	Not limited		Somewhat limited		Not limited	
			Depth to saturated zone	0.99		
OzB:						
Ottokee	Not limited		Very limited		Not limited	
			Depth to saturated zone	0.99		
Spinks	Not limited		Not limited		Not limited	
Pa:						
Paulding	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Pt:						
Pits, Quarry	Not rated		Not rated		Not rated	
RaB:						
Rawson	Somewhat limited		Very limited		Somewhat limited	

Table 21.--Building Site Development Part 1--Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
	Shrink-swell	0.50	Shrink-swell	1.00	Shrink-swell	0.50
			Depth to saturated zone	0.99	Slope	0.10
RdB:						
Rawson	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Shrink-swell	1.00	Shrink-swell	0.50
			Depth to saturated zone	0.99	Slope	0.10
ReB:						
Rawson	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	0.99	Shrink-swell	0.50
			Shrink-swell	0.50	Slope	0.10
RfA:						
Rimer	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
RgA:						
Rimer	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.87	Depth to saturated zone	1.00	Depth to saturated zone	0.87
			Shrink-swell	1.00		
RhB:						
Rimer	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
			Shrink-swell	0.50		
Tedrow	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
			Shrink-swell	0.50		
RmA:						
Rimer	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
			Shrink-swell	0.50		
RoA:						
Roselms	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
RrA:						
Roselms	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
Rs:						
Ross	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Flooding	1.00

Table 21.--Building Site Development Part 1--Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
			Depth to saturated zone	0.95		
SaE3:						
St. Clair	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
			Depth to saturated zone	0.99		
SbB2:						
St. Clair	Very limited		Very limited		Very limited	
	Shrink-swell	1.00	Depth to saturated zone	1.00	Shrink-swell	1.00
	Depth to saturated zone	0.83	Shrink-swell	1.00	Depth to saturated zone	0.83
					Slope	0.10
SbC2:						
St. Clair	Very limited		Very limited		Very limited	
	Shrink-swell	1.00	Depth to saturated zone	1.00	Shrink-swell	1.00
	Depth to saturated zone	0.83	Shrink-swell	1.00	Slope	1.00
	Slope	0.04	Slope	0.04	Depth to saturated zone	0.83
SbD2:						
St. Clair	Somewhat limited		Very limited		Very limited	
	Slope	0.96	Depth to saturated zone	1.00	Slope	1.00
	Shrink-swell	0.50	Slope	0.96	Shrink-swell	0.50
	Depth to saturated zone	0.10	Shrink-swell	0.50	Depth to saturated zone	0.10
SbE2:						
St. Clair	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
	Depth to saturated zone	0.10	Shrink-swell	0.50	Depth to saturated zone	0.10
ScC3:						
St. Clair	Very limited		Very limited		Very limited	
	Shrink-swell	1.00	Depth to saturated zone	1.00	Shrink-swell	1.00
	Depth to saturated zone	0.83	Shrink-swell	1.00	Slope	1.00
	Slope	0.04	Slope	0.04	Depth to saturated zone	0.83
ScD3:						
St. Clair	Very limited		Very limited		Very limited	
	Shrink-swell	1.00	Depth to saturated zone	1.00	Slope	1.00
	Slope	0.99	Shrink-swell	1.00	Shrink-swell	1.00
	Depth to saturated zone	0.83	Slope	0.99	Depth to saturated zone	0.83

Table 21.--Building Site Development Part 1--Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
ScE3:						
St. Clair	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	1.00	Depth to saturated zone	1.00	Shrink-swell	1.00
	Depth to saturated zone	0.83	Shrink-swell	1.00	Depth to saturated zone	0.83
ScF3:						
St. Clair	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	1.00	Depth to saturated zone	1.00	Shrink-swell	1.00
	Depth to saturated zone	0.83	Shrink-swell	1.00	Depth to saturated zone	0.83
SdB:						
Seward	Not limited		Very limited		Somewhat limited	
			Shrink-swell	1.00	Slope	0.10
			Depth to saturated zone	0.95		
SdC:						
Seward	Somewhat limited		Very limited		Very limited	
	Slope	0.04	Shrink-swell	1.00	Slope	1.00
			Depth to saturated zone	0.95		
			Slope	0.04		
SdD:						
Seward	Very limited		Very limited		Very limited	
	Slope	0.99	Shrink-swell	1.00	Slope	1.00
			Slope	0.99		
			Depth to saturated zone	0.95		
SeB:						
Seward	Not limited		Somewhat limited		Somewhat limited	
			Depth to saturated zone	0.95	Slope	0.10
			Shrink-swell	0.50		
SeC:						
Seward	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.04	Depth to saturated zone	0.95	Slope	1.00
			Shrink-swell	0.50		
			Slope	0.04		
SfA:						
Shinrock Variant	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.83	Depth to saturated zone	1.00	Depth to saturated zone	0.83
	Shrink-swell	0.50			Shrink-swell	0.50
Sh:						
Shoals	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00

Table 21.--Building Site Development Part 1--Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
Sm:						
Sloan	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Sn:						
Sloan	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50			Shrink-swell	0.50
So:						
Sloan	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
SpB:						
Spinks	Not limited		Not limited		Somewhat limited	
					Slope	0.10
SpC:						
Spinks	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.04	Slope	0.04	Slope	1.00
SpD:						
Spinks	Very limited		Very limited		Very limited	
	Slope	0.99	Slope	0.99	Slope	1.00
TdA:						
Tedrow	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
TeA:						
Tedrow Variant	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
To:						
Toledo	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Tt:						
Toledo	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
TuB2:						
Tuscola	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	0.99	Shrink-swell	0.50

Table 21.--Building Site Development Part 1--Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
					Slope	0.10
TuC2:						
Tuscola	Somewhat limited		Very limited		Very limited	
	Slope	0.04	Depth to saturated zone	0.99	Slope	1.00
			Slope	0.04		
Ud:						
Udorthents	Not rated		Not rated		Not rated	
Ur:						
Urban Land	Not rated		Not rated		Not rated	
VaA:						
Vaughnsville	Not limited		Very limited		Not limited	
			Shrink-swell	1.00		
			Depth to saturated zone	0.99		
W:						
Water	Not rated		Not rated		Not rated	
Wa:						
Wabasha	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
Wc:						
Warners	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Wf:						
Wauseon	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Shrink-swell	1.00	Ponding	1.00
			Ponding	1.00		
Wg:						
Wauseon	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50

TABLE 22.--BUILDING SITE DEVELOPMENT PART 2

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text on page 198 for further explanation of ratings in this table.)

Map symbol and soil name	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
Ad:						
Adrian	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Content of organic matter	1.00
	Subsidence	1.00	Depth to saturated zone	1.00	Gravel content	1.00
	Frost action	1.00	Ponding	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Content of organic matter	1.00	Ponding	1.00
ArB:						
Arkport	Not limited		Very limited		Somewhat limited	
			Cutbanks cave	1.00	Droughty	0.74
ArC:						
Arkport	Somewhat limited		Very limited		Somewhat limited	
	Slope	0.04	Cutbanks cave	1.00	Slope	0.04
			Slope	0.04		
AsA:						
Aurand	Very limited		Very limited		Very limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.99
	Depth to saturated zone	0.99	Depth to dense layer	0.50		
	Low strength	0.50				
AtA:						
Aurand	Very limited		Very limited		Very limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.99
	Depth to saturated zone	0.99	Depth to dense layer	0.50		
	Low strength	0.50				
BcA:						
Bixler	Very limited		Very limited		Not limited	
	Frost action	1.00	Cutbanks cave	1.00		
	Shrink-swell	0.50	Depth to saturated zone	0.99		
Ca:						
Clay Pits	Not rated		Not rated		Not rated	
Ch:						
Cohoctah	Very limited		Very limited		Very limited	
	Flooding	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	0.60
	Frost action	1.00	Flooding	0.60	Droughty	0.10

Table 22.--Building Site Development Part 2--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations		Lawns and landscaping	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ck:						
Colwood	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00	Ponding	1.00		
	Low strength	0.28				
Cm:						
Colwood	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00	Ponding	1.00		
	Low strength	0.28				
Cn:						
Colwood	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Low strength	1.00	Ponding	1.00		
	Ponding	1.00				
	Shrink-swell	0.50				
Co:						
Colwood	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00	Ponding	1.00		
	Low strength	0.90				
Cu:						
Cut And Fill Land	Not rated		Not rated		Not rated	
DeA:						
Del Rey	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Low strength	1.00				
	Frost action	1.00				
	Shrink-swell	0.50				
DfA:						
Del Rey	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Low strength	1.00				
	Frost action	1.00				
	Shrink-swell	0.50				
DuA:						
Digby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to saturated zone	1.00		

Table 22.--Building Site Development Part 2--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations		Lawns and landscaping	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
DyA:						
Digby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to saturated zone	1.00		
DzA:						
Digby	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Cutbanks cave	1.00	Depth to saturated zone	0.48
	Depth to saturated zone	0.48	Depth to saturated zone	1.00		
Ee:						
Eel	Very limited		Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00	Flooding	1.00
	Frost action	1.00	Flooding	0.80	Depth to saturated zone	0.43
	Depth to saturated zone	0.43				
	Low strength	0.28				
FsA:						
Fulton	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Depth to saturated zone	1.00		
	Shrink-swell	1.00	Too clayey	0.50		
	Frost action	0.50				
FsB:						
Fulton	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Depth to saturated zone	1.00		
	Shrink-swell	1.00	Too clayey	0.50		
	Frost action	0.50				
FuA:						
Fulton	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Depth to saturated zone	1.00		
	Shrink-swell	1.00	Too clayey	0.50		
	Frost action	0.50				
FuB:						
Fulton	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Depth to saturated zone	1.00		
	Shrink-swell	1.00	Too clayey	0.50		
	Frost action	0.50				

Table 22.--Building Site Development Part 2--Continued

Map symbol and soil name	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
FvA:						
Fulton Variant	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Depth to saturated zone	1.00		
	Frost action	1.00	Too clayey	0.50		
	Shrink-swell	1.00				
GaA:						
Galen	Somewhat limited		Very limited		Not limited	
	Frost action	0.50	Cutbanks cave	1.00		
			Depth to saturated zone	0.99		
GaB:						
Galen	Somewhat limited		Very limited		Not limited	
	Frost action	0.50	Cutbanks cave	1.00		
			Depth to saturated zone	0.99		
GbB:						
Galen	Somewhat limited		Very limited		Somewhat limited	
	Frost action	0.50	Cutbanks cave	1.00	Depth to saturated zone	0.43
	Depth to saturated zone	0.43	Depth to saturated zone	1.00		
Gm:						
Genesee	Very limited		Somewhat limited		Somewhat limited	
	Flooding	1.00	Flooding	0.60	Flooding	0.60
	Frost action	0.50				
	Low strength	0.05				
Go:						
Gilford	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00	Ponding	1.00		
Gr:						
Granby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Frost action	0.50	Ponding	1.00	Droughty	0.83
Gv:						
Gravel Pits	Not rated		Not rated		Not rated	
HaA:						
Haney	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Cutbanks cave	1.00	Depth to saturated zone	0.43
	Depth to saturated zone	0.43	Depth to saturated zone	1.00		

Table 22.--Building Site Development Part 2--Continued

Map symbol and soil name	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
HaB:						
Haney	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Cutbanks cave	1.00	Depth to saturated zone	0.43
	Depth to saturated zone	0.43	Depth to saturated zone	1.00		
HdA:						
Haney	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Cutbanks cave	1.00	Depth to saturated zone	0.43
	Depth to saturated zone	0.43	Depth to saturated zone	1.00		
HdB:						
Haney	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Cutbanks cave	1.00	Depth to saturated zone	0.43
	Depth to saturated zone	0.43	Depth to saturated zone	1.00		
HeC:						
Haney	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Cutbanks cave	1.00	Depth to saturated zone	0.43
	Depth to saturated zone	0.43	Depth to saturated zone	1.00	Slope	0.04
	Slope	0.04	Slope	0.04		
Rawson	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	0.99	Slope	0.04
	Shrink-swell	0.50	Too clayey	0.50		
	Frost action	0.50	Slope	0.04		
	Slope	0.04				
HkA:						
Haskins	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Too clayey	0.50		
	Frost action	1.00				
	Shrink-swell	1.00				
HlA:						
Haskins	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Too clayey	0.50		
	Frost action	1.00				
	Shrink-swell	1.00				
HlB:						
Haskins	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Too clayey	0.50		
	Low strength	0.05				

Table 22.--Building Site Development Part 2--Continued

Map symbol and soil name	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
HnA:						
Haskins	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Too clayey	0.50		
	Frost action	1.00				
	Shrink-swell	1.00				
Ho:						
Hoytville	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Ponding	1.00	Ponding	1.00
	Frost action	1.00	Too clayey	0.50		
	Shrink-swell	1.00				
	Ponding	1.00				
Hp:						
Hoytville	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Ponding	1.00	Ponding	1.00
	Frost action	1.00	Too clayey	0.50		
	Ponding	1.00				
	Shrink-swell	0.50				
Hr:						
Hoytville	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Ponding	1.00	Ponding	1.00
	Frost action	1.00	Too clayey	0.50		
	Ponding	1.00				
	Shrink-swell	0.50				
Hs:						
Hoytville	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Ponding	1.00	Too clayey	1.00
	Frost action	1.00	Too clayey	0.50	Ponding	1.00
	Ponding	1.00				
	Shrink-swell	0.50				
Hv:						
Hoytville	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Ponding	1.00	Too clayey	1.00
	Frost action	1.00	Too clayey	0.50	Ponding	1.00
	Shrink-swell	1.00				
	Ponding	1.00				
Hw:						
Hoytville Variant	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Ponding	1.00	Too clayey	1.00
	Frost action	1.00	Too clayey	0.50	Ponding	1.00
	Shrink-swell	1.00				
	Ponding	1.00				

Table 22.--Building Site Development Part 2--Continued

Map symbol and soil name	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
KeA:						
Kibbie	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to saturated zone	1.00		
	Low strength	0.50				
KfA:						
Kibbie	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to saturated zone	1.00		
	Low strength	1.00				
KlA:						
Kibbie	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to saturated zone	1.00		
	Low strength	1.00				
La:						
Latty	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Ponding	1.00	Too clayey	1.00
	Shrink-swell	1.00	Too clayey	0.50	Ponding	1.00
	Ponding	1.00				
	Frost action	0.50				
Lb:						
Latty	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Ponding	1.00	Too clayey	1.00
	Shrink-swell	1.00	Too clayey	0.50	Ponding	1.00
	Ponding	1.00				
	Frost action	0.50				
Le:						
Lenawee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Ponding	1.00	Ponding	1.00
	Frost action	1.00	Too clayey	0.50		
	Shrink-swell	1.00				
	Ponding	1.00				
Lf:						
Lenawee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Ponding	1.00	Ponding	1.00
	Frost action	1.00	Too clayey	0.50		
	Shrink-swell	1.00				
	Ponding	1.00				

Table 22.--Building Site Development Part 2--Continued

Map symbol and soil name	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
LwB2:						
Lucas	Very limited		Very limited		Not limited	
	Low strength	1.00	Depth to saturated zone	0.99		
	Shrink-swell	1.00	Too clayey	0.50		
	Frost action	0.50				
LwC2:						
Lucas	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	0.99	Slope	0.04
	Shrink-swell	1.00	Too clayey	0.50		
	Frost action	0.50	Slope	0.04		
	Slope	0.04				
LxC3:						
Lucas	Very limited		Very limited		Very limited	
	Low strength	1.00	Depth to saturated zone	0.99	Too clayey	1.00
	Shrink-swell	1.00	Too clayey	0.50	Slope	0.04
	Frost action	0.50	Slope	0.04		
	Slope	0.04				
LxE3:						
Lucas	Very limited		Very limited		Very limited	
	Low strength	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	1.00	Depth to saturated zone	0.99	Too clayey	1.00
	Slope	1.00	Too clayey	0.50		
	Frost action	0.50				
Mb:						
Mermill	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00				
	Low strength	0.28				
Aurand	Very limited		Very limited		Very limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.99
	Depth to saturated zone	0.99	Depth to dense layer	0.50		
	Low strength	0.50				
Mc:						
Mermill	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00	Too clayey	0.50		
	Shrink-swell	0.50				
Md:						
Medway	Very limited		Very limited		Somewhat limited	
	Flooding	1.00	Depth to saturated zone	0.99	Flooding	0.60
	Frost action	1.00	Flooding	0.60		
	Low strength	0.90				

Table 22.--Building Site Development Part 2--Continued

Map symbol and soil name	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
Me:						
Mermill-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00	Too clayey	0.50		
	Shrink-swell	0.50				
Mf:						
Mermill-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00	Too clayey	0.50		
	Shrink-swell	0.50				
Mg:						
Mermill-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00	Ponding	1.00		
	Shrink-swell	0.50	Too clayey	0.50		
Mh:						
Millgrove-----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00	Ponding	1.00		
	Low strength	0.50				
	Shrink-swell	0.50				
Mk:						
Millgrove-----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00	Ponding	1.00		
	Low strength	0.50				
	Shrink-swell	0.50				
NaA:						
Nappanee------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Too clayey	0.50		
	Shrink-swell	0.50				
	Frost action	0.50				
NaB:						
Nappanee------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Too clayey	0.50		
	Shrink-swell	0.50				
	Frost action	0.50				

Table 22.--Building Site Development Part 2--Continued

Map symbol and soil name	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
NtA:						
Nappanee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Too clayey	0.50		
	Shrink-swell	0.50				
	Frost action	0.50				
NtB:						
Nappanee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Too clayey	0.50		
	Shrink-swell	0.50				
	Frost action	0.50				
NtB2:						
Nappanee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Too clayey	0.50		
	Shrink-swell	0.50				
	Frost action	0.50				
OaC:						
Oakville	Not limited		Very limited		Very limited	
			Cutbanks cave	1.00	Droughty	1.00
ObB:						
Oakville	Not limited		Very limited		Somewhat limited	
			Cutbanks cave	1.00	Droughty	0.67
ObC:						
Oakville	Somewhat limited		Very limited		Somewhat limited	
	Slope	0.04	Cutbanks cave	1.00	Droughty	0.37
			Slope	0.04	Slope	0.04
OsB:						
Oshtemo	Not limited		Very limited		Not limited	
			Cutbanks cave	1.00		
OtB:						
Ottokee	Not limited		Very limited		Very limited	
			Cutbanks cave	1.00	Droughty	1.00
			Depth to saturated zone	0.99		
OuB:						
Ottokee	Not limited		Very limited		Somewhat limited	
			Cutbanks cave	1.00	Droughty	0.30
			Depth to saturated zone	0.99		
OzB:						
Ottokee	Not limited		Very limited		Somewhat limited	
			Cutbanks cave	1.00	Droughty	0.14
			Depth to saturated zone	0.99		

Table 22.--Building Site Development Part 2--Continued

Map symbol and soil name	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
Spinks---------------	Not limited		Very limited		Somewhat limited	
			Cutbanks cave	1.00	Droughty	0.30
Pa:						
Paulding------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Ponding	1.00	Too clayey	1.00
	Shrink-swell	1.00	Too clayey	0.50	Ponding	1.00
	Ponding	1.00				
	Frost action	0.50				
Pt:						
Pits, Quarry--------	Not rated		Not rated		Not rated	
RaB:						
Rawson--------------	Very limited		Very limited		Not limited	
	Shrink-swell	1.00	Depth to saturated zone	0.99		
	Low strength	1.00	Too clayey	0.50		
	Frost action	0.50				
RdB:						
Rawson--------------	Very limited		Very limited		Not limited	
	Shrink-swell	1.00	Depth to saturated zone	0.99		
	Low strength	1.00	Too clayey	0.50		
	Frost action	0.50				
ReB:						
Rawson--------------	Somewhat limited		Very limited		Not limited	
	Shrink-swell	0.50	Depth to saturated zone	0.99		
	Frost action	0.50	Too clayey	0.50		
RfA:						
Rimer---------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Depth to saturated zone	1.00	Droughty	0.50
	Frost action	1.00	Too clayey	0.50		
	Shrink-swell	1.00				
RgA:						
Rimer---------------	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Cutbanks cave	1.00	Depth to saturated zone	0.48
	Depth to saturated zone	0.48	Depth to saturated zone	1.00		
RhB:						
Rimer---------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to saturated zone	1.00	Droughty	0.08
Tedrow--------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Frost action	0.50	Depth to saturated zone	1.00	Droughty	0.07

Table 22.--Building Site Development Part 2--Continued

Map symbol and soil name	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
RmA:						
Rimer	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to saturated zone	1.00	Droughty	0.03
			Too clayey	0.50		
RoA:						
Roselms	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Too clayey	0.50		
	Shrink-swell	1.00				
	Frost action	0.50				
RrA:						
Roselms	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Too clayey	0.50	Too clayey	1.00
	Shrink-swell	1.00				
	Frost action	0.50				
Rs:						
Ross	Very limited		Somewhat limited		Somewhat limited	
	Flooding	1.00	Depth to saturated zone	0.95	Flooding	0.60
	Low strength	0.50	Flooding	0.60		
	Frost action	0.50				
SaE3:						
St. Clair	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	1.00	Depth to saturated zone	0.99	Too clayey	1.00
	Shrink-swell	1.00	Too clayey	0.50		
	Frost action	0.50				
SbB2:						
St. Clair	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.43
	Shrink-swell	1.00	Too clayey	0.50		
	Frost action	0.50				
	Depth to saturated zone	0.43				
SbC2:						
St. Clair	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.43
	Shrink-swell	1.00	Too clayey	0.50	Slope	0.04
	Frost action	0.50	Slope	0.04		
	Depth to saturated zone	0.43				
	Slope	0.04				

Table 22.--Building Site Development Part 2--Continued

Map symbol and soil name	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
SbD2:						
St. Clair-----------	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Slope	0.96
	Slope	0.96	Slope	0.96	Depth to saturated zone	0.03
	Shrink-swell	0.50				
	Frost action	0.50				
	Depth to saturated zone	0.03				
SbE2:						
St. Clair-----------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.03
	Shrink-swell	0.50				
	Frost action	0.50				
	Depth to saturated zone	0.03				
ScC3:						
St. Clair-----------	Very limited		Very limited		Very limited	
	Low strength	1.00	Depth to saturated zone	1.00	Too clayey	1.00
	Shrink-swell	1.00	Too clayey	0.50	Depth to saturated zone	0.43
	Frost action	0.50	Slope	0.04	Slope	0.04
	Depth to saturated zone	0.43				
	Slope	0.04				
ScD3:						
St. Clair-----------	Very limited		Very limited		Very limited	
	Low strength	1.00	Depth to saturated zone	1.00	Too clayey	1.00
	Shrink-swell	1.00	Slope	0.99	Slope	0.99
	Slope	0.99	Too clayey	0.50	Depth to saturated zone	0.43
	Frost action	0.50				
	Depth to saturated zone	0.43				
ScE3:						
St. Clair-----------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	1.00	Depth to saturated zone	1.00	Too clayey	1.00
	Shrink-swell	1.00	Too clayey	0.50	Depth to saturated zone	0.43
	Frost action	0.50				
	Depth to saturated zone	0.43				
ScF3:						
St. Clair-----------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	1.00	Depth to saturated zone	1.00	Too clayey	1.00
	Shrink-swell	1.00	Too clayey	0.50	Depth to saturated zone	0.43
	Frost action	0.50				
	Depth to saturated zone	0.43				

Table 22.--Building Site Development Part 2--Continued

Map symbol and soil name	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
SdB:						
Seward--------------	Somewhat limited		Very limited		Somewhat limited	
	Frost action	0.50	Cutbanks cave	1.00	Droughty	0.46
			Depth to saturated zone	0.95		
			Too clayey	0.50		
SdC:						
Seward--------------	Somewhat limited		Very limited		Somewhat limited	
	Frost action	0.50	Cutbanks cave	1.00	Droughty	0.46
	Slope	0.04	Depth to saturated zone	0.95	Slope	0.04
			Too clayey	0.50		
			Slope	0.04		
SdD:						
Seward--------------	Very limited		Very limited		Very limited	
	Slope	0.99	Cutbanks cave	1.00	Slope	0.99
	Frost action	0.50	Slope	0.99	Droughty	0.46
			Depth to saturated zone	0.95		
			Too clayey	0.50		
SeB:						
Seward--------------	Somewhat limited		Very limited		Somewhat limited	
	Frost action	0.50	Cutbanks cave	1.00	Droughty	0.03
			Depth to saturated zone	0.95		
			Too clayey	0.50		
SeC:						
Seward--------------	Somewhat limited		Very limited		Somewhat limited	
	Frost action	0.50	Cutbanks cave	1.00	Slope	0.04
	Slope	0.04	Depth to saturated zone	0.95	Droughty	0.03
			Too clayey	0.50		
			Slope	0.04		
SfA:						
Shinrock Variant----	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Cutbanks cave	1.00	Depth to saturated zone	0.43
	Frost action	1.00	Depth to saturated zone	1.00		
	Shrink-swell	0.50				
	Depth to saturated zone	0.43				
Sh:						
Shoals--------------	Very limited		Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Flooding	0.80	Depth to saturated zone	1.00
	Frost action	1.00				

Table 22.--Building Site Development Part 2--Continued

Map symbol and soil name	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
Sm:						
Sloan	Very limited		Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Flooding	0.80	Ponding	1.00
	Low strength	1.00				
	Ponding	1.00				
Sn:						
Sloan	Very limited		Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Flooding	0.60	Flooding	0.60
	Frost action	1.00				
	Low strength	1.00				
	Shrink-swell	0.50				
So:						
Sloan	Very limited		Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Flooding	0.80	Depth to saturated zone	1.00
	Frost action	1.00				
	Low strength	1.00				
	Shrink-swell	0.50				
SpB:						
Spinks	Not limited		Very limited		Very limited	
			Cutbanks cave	1.00	Droughty	1.00
SpC:						
Spinks	Somewhat limited		Very limited		Very limited	
	Slope	0.04	Cutbanks cave	1.00	Droughty	1.00
			Slope	0.04	Slope	0.04
SpD:						
Spinks	Very limited		Very limited		Very limited	
	Slope	0.99	Cutbanks cave	1.00	Droughty	1.00
			Slope	0.99	Slope	0.99
TdA:						
Tedrow	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Frost action	0.50	Depth to saturated zone	1.00	Droughty	0.73
TeA:						
Tedrow Variant	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Frost action	0.50	Depth to saturated zone	1.00	Droughty	0.13
To:						
Toledo	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Ponding	1.00	Ponding	1.00
	Shrink-swell	1.00	Too clayey	0.50		
	Ponding	1.00				
	Frost action	0.50				

Table 22.--Building Site Development Part 2--Continued

Map symbol and soil name	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
Tt:						
Toledo	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Ponding	1.00	Too clayey	1.00
	Shrink-swell	1.00	Too clayey	0.50	Ponding	1.00
	Ponding	1.00				
	Frost action	0.50				
TuB2:						
Tuscola	Very limited		Very limited		Not limited	
	Frost action	1.00	Cutbanks cave	1.00		
	Low strength	0.90	Depth to saturated zone	0.99		
	Shrink-swell	0.50				
TuC2:						
Tuscola	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Cutbanks cave	1.00	Slope	0.04
	Low strength	0.90	Depth to saturated zone	0.99		
	Slope	0.04	Slope	0.04		
Ud:						
Udorthents	Not rated		Not rated		Not rated	
Ur:						
Urban Land	Not rated		Not rated		Not rated	
VaA:						
Vaughnsville	Very limited		Very limited		Not limited	
	Frost action	1.00	Depth to saturated zone	0.99		
			Too clayey	0.50		
W:						
Water	Not rated		Not rated		Not rated	
Wa:						
Wabasha	Very limited		Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Flooding	0.80	Depth to saturated zone	1.00
	Low strength	1.00	Too clayey	0.50	Too clayey	1.00
	Frost action	1.00				
	Shrink-swell	1.00				
Wc:						
Warners	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Gravel content	1.00
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Wf:						
Wauseon	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00	Ponding	1.00		
			Too clayey	0.50		
Wg:						
Wauseon	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00	Ponding	1.00		
	Shrink-swell	0.50	Too clayey	0.50		

TABLE 23.--SANITARY FACILITIES PART 1

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text on page 199 for further explanation of ratings in this table.)

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
Ad:				
Adrian	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Filtering capacity	1.00	Seepage	1.00
	Subsidence	1.00	Ponding	1.00
	Ponding	1.00	Content of organic matter	1.00
ArB:				
Arkport	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.32
ArC:				
Arkport	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Slope	0.04	Slope	1.00
AsA:				
Aurand	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53
AtA:				
Aurand	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53
BcA:				
Bixler	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	1.00
			Slope	0.01
Ca:				
Clay Pits	Not rated		Not rated	
Ch:				
Cohoctah	Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Flooding	1.00
			Seepage	1.00

Table 23.--Sanitary Facilities Part 1--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
Ck:				
Colwood	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.72	Seepage	0.53
Cm:				
Colwood	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.72	Seepage	0.53
Cn:				
Colwood	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Ponding	1.00
	Ponding	1.00	Seepage	0.53
Co:				
Colwood	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.46	Seepage	0.53
Cu:				
Cut And Fill Land	Not rated		Not rated	
DeA:				
Del Rey	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00		
DfA:				
Del Rey	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00		
DuA:				
Digby	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.46		

Table 23.--Sanitary Facilities Part 1--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
DyA:				
Digby	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.46		
DzA:				
Digby	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.46	Slope	0.01
Ee:				
Eel	Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Flooding	1.00
	Restricted permeability	0.46	Seepage	1.00
FsA:				
Fulton	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00		
FsB:				
Fulton	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	0.32
FuA:				
Fulton	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00		
FuB:				
Fulton	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	0.32
FvA:				
Fulton Variant	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	1.00

Table 23.--Sanitary Facilities Part 1--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
GaA:				
Galen	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Filtering capacity	1.00	Seepage	1.00
GaB:				
Galen	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.32
GbB:				
Galen	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
			Seepage	1.00
			Slope	0.32
Gm:				
Genesee	Very limited		Very limited	
	Flooding	1.00	Flooding	1.00
	Restricted permeability	0.46	Seepage	0.53
Go:				
Gilford	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Filtering capacity	1.00	Seepage	1.00
	Ponding	1.00	Ponding	1.00
Gr:				
Granby	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Filtering capacity	1.00	Seepage	1.00
	Ponding	1.00	Ponding	1.00
Gv:				
Gravel Pits	Not rated		Not rated	
HaA:				
Haney	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.46		

Table 23.--Sanitary Facilities Part 1--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
HaB:				
Haney----------------	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.46	Slope	0.32
HdA:				
Haney----------------	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.46		
HdB:				
Haney----------------	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.46	Slope	0.32
HeC:				
Haney----------------	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.46	Slope	1.00
	Slope	0.04		
Rawson---------------	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	0.04	Seepage	0.53
HkA:				
Haskins--------------	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53
HlA:				
Haskins--------------	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53

Table 23.--Sanitary Facilities Part 1--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
HlB:				
Haskins	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53
			Slope	0.32
HnA:				
Haskins	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53
Ho:				
Hoytville	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00		
Hp:				
Hoytville	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00		
Hr:				
Hoytville	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00		
Hs:				
Hoytville	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00		
Hv:				
Hoytville	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00		
Hw:				
Hoytville Variant	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00		

Table 23.--Sanitary Facilities Part 1--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
KeA:				
Kibbie	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	1.00
KfA:				
Kibbie	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	0.53
KlA:				
Kibbie	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	0.53
La:				
Latty	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00		
Lb:				
Latty	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00		
Le:				
Lenawee	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Ponding	1.00
	Ponding	1.00		
Lf:				
Lenawee	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Ponding	1.00
	Ponding	1.00		
LwB2:				
Lucas	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	0.32

Table 23.--Sanitary Facilities Part 1--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
LwC2:				
Lucas	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	0.04		
LxC3:				
Lucas	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	0.04		
LxE3:				
Lucas	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	1.00		
Mb:				
Mermill	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00	Seepage	0.53
Aurand	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53
Mc:				
Mermill	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00	Seepage	0.53
Md:				
Medway	Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Flooding	1.00
	Restricted permeability	0.46	Seepage	0.53
Me:				
Mermill	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00	Seepage	0.53

Table 23.--Sanitary Facilities Part 1--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
Mf:				
Mermill	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00	Seepage	0.53
Mg:				
Mermill	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00	Seepage	0.53
Mh:				
Millgrove	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Filtering capacity	1.00	Seepage	1.00
	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.46		
Mk:				
Millgrove	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Filtering capacity	1.00	Seepage	1.00
	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.46		
NaA:				
Nappanee	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00		
NaB:				
Nappanee	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	0.32
NtA:				
Nappanee	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00		
NtB:				
Nappanee	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00

Table 23.--Sanitary Facilities Part 1--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
	Depth to saturated zone	1.00	Slope	0.32
NtB2:				
Nappanee	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	0.32
OaC:				
Oakville	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	1.00
ObB:				
Oakville	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.32
ObC:				
Oakville	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Slope	0.04	Slope	1.00
OsB:				
Oshtemo	Not limited		Very limited	
			Seepage	1.00
			Slope	0.32
OtB:				
Ottokee	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.08
OuB:				
Ottokee	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.08
OzB:				
Ottokee	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.08
Spinks	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.08

Table 23.--Sanitary Facilities Part 1--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
Pa:				
Paulding	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00		
Pt:				
Pits, Quarry	Not rated		Not rated	
RaB:				
Rawson	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53
			Slope	0.32
RdB:				
Rawson	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53
			Slope	0.32
ReB:				
Rawson	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Seepage	0.53
			Slope	0.32
RfA:				
Rimer	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	1.00
	Filtering capacity	1.00		
RgA:				
Rimer	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	1.00
			Slope	0.01
RhB:				
Rimer	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	1.00
	Filtering capacity	1.00	Slope	0.08

Table 23.--Sanitary Facilities Part 1--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
Tedrow	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	1.00
	Filtering capacity	1.00	Slope	0.08
RmA:				
Rimer	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	1.00
	Filtering capacity	1.00		
RoA:				
Roselms	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00		
RrA:				
Roselms	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00		
Rs:				
Ross	Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Flooding	1.00
	Restricted permeability	0.46	Seepage	0.53
SaE3:				
St. Clair	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	1.00		
SbB2:				
St. Clair	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	0.32

Table 23.--Sanitary Facilities Part 1--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Septic tank absorption fields: Value	Sewage lagoons: Rating class and limiting features	Sewage lagoons: Value
SbC2:				
St. Clair	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	0.04		
SbD2:				
St. Clair	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	0.96		
SbE2:				
St. Clair	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	1.00		
ScC3:				
St. Clair	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	0.04		
ScD3:				
St. Clair	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	0.99		
ScE3:				
St. Clair	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	1.00		
ScF3:				
St. Clair	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	1.00		
SdB:				
Seward	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	1.00

Table 23.--Sanitary Facilities Part 1--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
	Filtering capacity	1.00	Slope	0.32
SdC:				
Seward	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	1.00
	Filtering capacity	1.00	Slope	1.00
	Slope	0.04		
SdD:				
Seward	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Filtering capacity	1.00	Seepage	1.00
	Slope	0.99		
SeB:				
Seward	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	1.00
	Filtering capacity	1.00	Slope	0.32
SeC:				
Seward	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	1.00
	Filtering capacity	1.00	Slope	1.00
	Slope	0.04		
SfA:				
Shinrock Variant	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	1.00		
Sh:				
Shoals	Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Flooding	1.00
	Restricted permeability	0.46	Seepage	0.53

Table 23.--Sanitary Facilities Part 1--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
Sm:				
Sloan	Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Flooding	1.00
	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.72	Seepage	0.28
Sn:				
Sloan	Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Flooding	1.00
	Restricted permeability	0.72	Seepage	0.28
So:				
Sloan	Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Flooding	1.00
	Restricted permeability	0.72	Seepage	0.28
SpB:				
Spinks	Not limited		Very limited	
			Seepage	1.00
			Slope	0.32
SpC:				
Spinks	Somewhat limited		Very limited	
	Slope	0.04	Seepage	1.00
			Slope	1.00
SpD:				
Spinks	Very limited		Very limited	
	Slope	0.99	Slope	1.00
			Seepage	1.00
TdA:				
Tedrow	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Filtering capacity	1.00	Seepage	1.00
TeA:				
Tedrow Variant	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.72		

Table 23.--Sanitary Facilities Part 1--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
To:				
Toledo	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00		
Tt:				
Toledo	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00		
TuB2:				
Tuscola	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	0.53
			Slope	0.32
TuC2:				
Tuscola	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Slope	1.00
	Slope	0.04	Seepage	0.53
Ud:				
Udorthents	Not rated		Not rated	
Ur:				
Urban Land	Not rated		Not rated	
VaA:				
Vaughnsville	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53
W:				
Water	Not rated		Not rated	
Wa:				
Wabasha	Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Flooding	1.00
	Depth to saturated zone	1.00		
Wc:				
Warners	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	1.00

Table 23.--Sanitary Facilities Part 1--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
Wf:				
Wauseon-------------	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	1.00
	Filtering capacity	1.00	Ponding	1.00
	Ponding	1.00		
Wg:				
Wauseon-------------	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Seepage	1.00
	Restricted permeability	0.46	Ponding	1.00

TABLE 24.--SANITARY FACILITIES PART 2

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text on page 199 for further explanation of ratings in this table.)

Map symbol and soil name	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
Ad:						
Adrian	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage (bottom layer)	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00			Gravel content	0.89
ArB:						
Arkport	Very limited		Very limited		Not limited	
	Seepage (bottom layer)	1.00	Seepage	1.00		
ArC:						
Arkport	Very limited		Very limited		Somewhat limited	
	Seepage (bottom layer)	1.00	Seepage	1.00	Slope	0.04
	Slope	0.04	Slope	0.04		
AsA:						
Aurand	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
AtA:						
Aurand	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
BcA:						
Bixler	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
	Too clayey	0.50	Seepage	1.00	Depth to saturated zone	0.24
Ca:						
Clay Pits	Not rated		Not rated		Not rated	
Ch:						
Cohoctah	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
	Seepage (bottom layer)	1.00	Seepage	1.00		
Ck:						
Colwood	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00

Table 24.--Sanitary Facilities Part 2--Continued

Map symbol and soil name	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Cm:						
Colwood	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Cn:						
Colwood	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Co:						
Colwood	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Cu:						
Cut And Fill Land	Not rated		Not rated		Not rated	
DeA:						
Del Rey	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
DfA:						
Del Rey	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
DuA:						
Digby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage (bottom layer)	1.00	Seepage	1.00		
DyA:						
Digby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage (bottom layer)	1.00	Seepage	1.00		
DzA:						
Digby	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.96
	Seepage (bottom layer)	1.00	Seepage	1.00	Gravel content	0.01
Ee:						
Eel	Very limited		Very limited		Somewhat limited	
	Flooding	1.00	Flooding	1.00	Depth to saturated zone	0.95
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
	Seepage (bottom layer)	1.00	Seepage	1.00		

Table 24.--Sanitary Facilities Part 2--Continued

Map symbol and soil name	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
FsA:						
Fulton	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00			Too clayey	1.00
FsB:						
Fulton	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00			Too clayey	1.00
FuA:						
Fulton	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00			Too clayey	1.00
FuB:						
Fulton	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00			Too clayey	1.00
FvA:						
Fulton Variant	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
			Seepage	1.00		
GaA:						
Galen	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too sandy	0.50
	Seepage (bottom layer)	1.00	Seepage	1.00	Depth to saturated zone	0.47
	Too sandy	0.50				
GaB:						
Galen	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too sandy	0.50
	Seepage (bottom layer)	1.00	Seepage	1.00	Depth to saturated zone	0.47
	Too sandy	0.50				
GbB:						
Galen	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.95
	Seepage (bottom layer)	1.00	Seepage	1.00	Too sandy	0.50
	Too sandy	0.50				

Table 24.--Sanitary Facilities Part 2--Continued

Map symbol and soil name	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
Gm:						
Genesee	Very limited		Very limited		Not limited	
	Flooding	1.00	Flooding	1.00		
Go:						
Gilford	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage (bottom layer)	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00				
Gr:						
Granby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage (bottom layer)	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00				
Gv:						
Gravel Pits	Not rated		Not rated		Not rated	
HaA:						
Haney	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.95
	Seepage (bottom layer)	1.00			Too sandy	0.50
	Too sandy	0.50				
HaB:						
Haney	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.95
	Seepage (bottom layer)	1.00			Too sandy	0.50
	Too sandy	0.50				
HdA:						
Haney	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.95
	Seepage (bottom layer)	1.00			Too sandy	0.50
	Too sandy	0.50				
HdB:						
Haney	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.95
	Seepage (bottom layer)	1.00			Too sandy	0.50
	Too sandy	0.50				
HeC:						
Haney	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.95
	Seepage (bottom layer)	1.00	Slope	0.04	Too sandy	0.50
	Too sandy	0.50			Slope	0.04
	Slope	0.04				

Table 24.--Sanitary Facilities Part 2--Continued

Map symbol and soil name	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
Rawson	Very limited		Somewhat limited		Very limited	
	Too clayey	1.00	Depth to saturated zone	0.19	Too clayey	1.00
	Depth to saturated zone	0.86	Slope	0.04	Hard to compact	1.00
	Slope	0.04			Depth to saturated zone	0.47
					Slope	0.04
HkA:						
Haskins	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00			Too clayey	1.00
					Hard to compact	1.00
HlA:						
Haskins	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00			Too clayey	1.00
					Hard to compact	1.00
HlB:						
Haskins	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00			Too clayey	1.00
					Hard to compact	1.00
HnA:						
Haskins	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00			Too clayey	1.00
					Hard to compact	1.00
Ho:						
Hoytville	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00	Ponding	1.00	Too clayey	1.00
	Ponding	1.00			Hard to compact	1.00
					Ponding	1.00
Hp:						
Hoytville	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00	Ponding	1.00	Too clayey	1.00
	Ponding	1.00			Ponding	1.00
Hr:						
Hoytville	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00	Ponding	1.00	Too clayey	1.00
	Ponding	1.00			Hard to compact	1.00
					Ponding	1.00

Table 24.--Sanitary Facilities Part 2--Continued

Map symbol and soil name	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
Hs:						
Hoytville	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00	Ponding	1.00	Too clayey	1.00
	Ponding	1.00			Hard to compact	1.00
					Ponding	1.00
Hv:						
Hoytville	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00	Ponding	1.00	Too clayey	1.00
	Ponding	1.00			Hard to compact	1.00
					Ponding	1.00
Hw:						
Hoytville Variant	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00	Ponding	1.00	Too clayey	1.00
	Ponding	1.00			Hard to compact	1.00
					Ponding	1.00
KeA:						
Kibbie	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too sandy	1.00			Too sandy	1.00
KfA:						
Kibbie	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too sandy	1.00			Too sandy	1.00
KlA:						
Kibbie	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too sandy	1.00			Too sandy	1.00
La:						
Latty	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00	Ponding	1.00	Too clayey	1.00
	Ponding	1.00			Hard to compact	1.00
					Ponding	1.00
Lb:						
Latty	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00	Ponding	1.00	Too clayey	1.00
	Ponding	1.00			Hard to compact	1.00
					Ponding	1.00

Table 24.--Sanitary Facilities Part 2--Continued

Map symbol and soil name	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Le:						
Lenawee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Too clayey	0.50			Too clayey	0.50
Lf:						
Lenawee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Too clayey	0.50			Too clayey	0.50
LwB2:						
Lucas	Very limited		Somewhat limited		Very limited	
	Too clayey	1.00	Depth to saturated zone	0.19	Too clayey	1.00
	Depth to saturated zone	0.86			Hard to compact	1.00
					Depth to saturated zone	0.47
LwC2:						
Lucas	Very limited		Somewhat limited		Very limited	
	Too clayey	1.00	Depth to saturated zone	0.19	Too clayey	1.00
	Depth to saturated zone	0.86	Slope	0.04	Hard to compact	1.00
	Slope	0.04			Depth to saturated zone	0.47
					Slope	0.04
LxC3:						
Lucas	Very limited		Somewhat limited		Very limited	
	Too clayey	1.00	Depth to saturated zone	0.19	Too clayey	1.00
	Depth to saturated zone	0.86	Slope	0.04	Hard to compact	1.00
	Slope	0.04			Depth to saturated zone	0.47
					Slope	0.04
LxE3:						
Lucas	Very limited		Very limited		Very limited	
	Too clayey	1.00	Slope	1.00	Too clayey	1.00
	Slope	1.00	Depth to saturated zone	0.19	Hard to compact	1.00
	Depth to saturated zone	0.86			Slope	1.00
					Depth to saturated zone	0.47
Mb:						
Mermill	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
	Ponding	1.00	Ponding	1.00	Ponding	1.00

Table 24.--Sanitary Facilities Part 2--Continued

Map symbol and soil name	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
Aurand	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
Mc:						
Mermill	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00	Ponding	1.00	Too clayey	1.00
	Ponding	1.00			Hard to compact	1.00
					Ponding	1.00
Md:						
Medway	Very limited		Very limited		Somewhat limited	
	Flooding	1.00	Flooding	1.00	Too clayey	0.50
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.47
	Too clayey	0.50				
Me:						
Mermill	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Mf:						
Mermill	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Mg:						
Mermill	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Mh:						
Millgrove	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage (bottom layer)	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00			Too clayey	0.50
	Too clayey	0.50				
Mk:						
Millgrove	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage (bottom layer)	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00			Too clayey	0.50
	Too clayey	0.50				
NaA:						
Nappanee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50

Table 24.--Sanitary Facilities Part 2--Continued

Map symbol and soil name	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
NaB:						
Nappanee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
NtA:						
Nappanee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
NtB:						
Nappanee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
NtB2:						
Nappanee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
OaC:						
Oakville	Very limited		Very limited		Very limited	
	Seepage (bottom layer)	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00				
ObB:						
Oakville	Very limited		Very limited		Very limited	
	Seepage (bottom layer)	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00				
ObC:						
Oakville	Very limited		Very limited		Very limited	
	Seepage (bottom layer)	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00	Slope	0.04	Seepage	1.00
	Slope	0.04			Slope	0.04
OsB:						
Oshtemo	Very limited		Very limited		Very limited	
	Seepage (bottom layer)	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00				
OtB:						
Ottokee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too sandy	1.00
	Seepage (bottom layer)	1.00	Seepage	1.00	Depth to saturated zone	0.24
	Too sandy	1.00				

Table 24.--Sanitary Facilities Part 2--Continued

Map symbol and soil name	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
OuB:						
Ottokee	Very limited Depth to saturated zone Seepage (bottom layer) Too sandy	 1.00 1.00 1.00	Very limited Depth to saturated zone Seepage	 1.00 1.00	Very limited Too sandy Depth to saturated zone	 1.00 0.24
OzB:						
Ottokee	Very limited Depth to saturated zone Seepage (bottom layer) Too sandy	 1.00 1.00 0.50	Very limited Depth to saturated zone Seepage	 1.00 1.00	Somewhat limited Too sandy Depth to saturated zone	 0.50 0.44
Spinks	Very limited Seepage (bottom layer) Too sandy	 1.00 0.50	Very limited Seepage	 1.00	Somewhat limited Too sandy	 0.50
Pa:						
Paulding	Very limited Depth to saturated zone Too clayey Ponding	 1.00 1.00 1.00	Very limited Depth to saturated zone Ponding	 1.00 1.00	Very limited Depth to saturated zone Too clayey Hard to compact Ponding	 1.00 1.00 1.00 1.00
Pt:						
Pits, Quarry	Not rated		Not rated		Not rated	
RaB:						
Rawson	Very limited Too clayey Depth to saturated zone	 1.00 0.86	Somewhat limited Depth to saturated zone	 0.19	Very limited Too clayey Hard to compact Depth to saturated zone	 1.00 1.00 0.47
RdB:						
Rawson	Very limited Too clayey Depth to saturated zone	 1.00 0.86	Somewhat limited Depth to saturated zone	 0.19	Very limited Too clayey Hard to compact Depth to saturated zone	 1.00 1.00 0.47
ReB:						
Rawson	Somewhat limited Depth to saturated zone	 0.86	Somewhat limited Depth to saturated zone	 0.19	Somewhat limited Depth to saturated zone	 0.47
RfA:						
Rimer	Very limited Depth to saturated zone Too clayey	 1.00 1.00	Very limited Depth to saturated zone Seepage	 1.00 1.00	Very limited Depth to saturated zone Hard to compact Too clayey	 1.00 1.00 1.00

Table 24.--Sanitary Facilities Part 2--Continued

Map symbol and soil name	Trench sanitary landfill: Rating class and limiting features	Trench sanitary landfill: Value	Area sanitary landfill: Rating class and limiting features	Area sanitary landfill: Value	Daily cover for landfill: Rating class and limiting features	Daily cover for landfill: Value
RgA:						
Rimer	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Seepage	1.00	Depth to saturated zone	0.96
	Too clayey	0.50	Depth to saturated zone	0.94	Too clayey	0.50
RhB:						
Rimer	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50	Seepage	1.00	Too clayey	0.50
Tedrow	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50	Seepage	1.00	Too clayey	0.50
RmA:						
Rimer	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
			Seepage	1.00		
RoA:						
Roselms	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00			Too clayey	1.00
					Hard to compact	1.00
RrA:						
Roselms	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00			Too clayey	1.00
					Hard to compact	1.00
Rs:						
Ross	Very limited		Very limited		Somewhat limited	
	Flooding	1.00	Flooding	1.00	Depth to saturated zone	0.11
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
SaE3:						
St. Clair	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Too clayey	1.00	Depth to saturated zone	0.19	Too clayey	1.00
	Depth to saturated zone	0.86			Hard to compact	1.00
					Depth to saturated zone	0.47
SbB2:						
St. Clair	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.92	Too clayey	1.00
	Too clayey	1.00			Hard to compact	1.00
					Depth to saturated zone	0.95

Table 24.--Sanitary Facilities Part 2--Continued

Map symbol and soil name	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
SbC2: St. Clair	Very limited Depth to saturated zone Too clayey Slope	 1.00 1.00 0.04	Somewhat limited Depth to saturated zone Slope	 0.92 0.04	Very limited Too clayey Hard to compact Depth to saturated zone Slope	 1.00 1.00 0.95 0.04
SbD2: St. Clair	Somewhat limited Slope Depth to saturated zone Too clayey	 0.96 0.95 0.50	Somewhat limited Slope Depth to saturated zone	 0.96 0.44	Somewhat limited Slope Depth to saturated zone Too clayey	 0.96 0.68 0.50
SbE2: St. Clair	Very limited Slope Depth to saturated zone Too clayey	 1.00 0.95 0.50	Very limited Slope Depth to saturated zone	 1.00 0.44	Very limited Slope Depth to saturated zone Too clayey	 1.00 0.68 0.50
ScC3: St. Clair	Very limited Depth to saturated zone Too clayey Slope	 1.00 1.00 0.04	Somewhat limited Depth to saturated zone Slope	 0.92 0.04	Very limited Too clayey Hard to compact Depth to saturated zone Slope	 1.00 1.00 0.95 0.04
ScD3: St. Clair	Very limited Depth to saturated zone Too clayey Slope	 1.00 1.00 0.99	Very limited Slope Depth to saturated zone	 0.99 0.92	Very limited Too clayey Hard to compact Slope Depth to saturated zone	 1.00 1.00 0.99 0.95
ScE3: St. Clair	Very limited Depth to saturated zone Slope Too clayey	 1.00 1.00 1.00	Very limited Slope Depth to saturated zone	 1.00 0.92	Very limited Slope Too clayey Hard to compact Depth to saturated zone	 1.00 1.00 1.00 0.95
ScF3: St. Clair	Very limited Depth to saturated zone Slope Too clayey	 1.00 1.00 1.00	Very limited Slope Depth to saturated zone	 1.00 0.92	Very limited Slope Too clayey Hard to compact Depth to saturated zone	 1.00 1.00 1.00 0.95

Table 24.--Sanitary Facilities Part 2--Continued

Map symbol and soil name	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
SdB:						
Seward	Very limited		Very limited		Very limited	
	Too clayey	1.00	Seepage	1.00	Too clayey	1.00
	Depth to saturated zone	0.47			Hard to compact	1.00
					Depth to saturated zone	0.11
SdC:						
Seward	Very limited		Very limited		Very limited	
	Too clayey	1.00	Seepage	1.00	Too clayey	1.00
	Depth to saturated zone	0.47	Slope	0.04	Hard to compact	1.00
	Slope	0.04			Depth to saturated zone	0.11
					Slope	0.04
SdD:						
Seward	Very limited		Very limited		Very limited	
	Too clayey	1.00	Seepage	1.00	Too clayey	1.00
	Slope	0.99	Slope	0.99	Hard to compact	1.00
	Depth to saturated zone	0.47			Slope	0.99
					Depth to saturated zone	0.11
SeB:						
Seward	Somewhat limited		Very limited		Somewhat limited	
	Too clayey	0.50	Seepage	1.00	Too clayey	0.50
	Depth to saturated zone	0.47			Depth to saturated zone	0.11
SeC:						
Seward	Very limited		Very limited		Very limited	
	Too clayey	1.00	Seepage	1.00	Too clayey	1.00
	Depth to saturated zone	0.47	Slope	0.04	Depth to saturated zone	0.11
	Slope	0.04			Slope	0.04
SfA:						
Shinrock Variant	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Seepage	1.00	Too sandy	1.00
	Seepage (bottom layer)	1.00	Depth to saturated zone	0.92	Seepage	1.00
	Too sandy	1.00			Depth to saturated zone	0.95
Sh:						
Shoals	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		

Table 24.--Sanitary Facilities Part 2--Continued

Map symbol and soil name	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
Sm:						
Sloan----------------	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00	Ponding	1.00		
Sn:						
Sloan----------------	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
So:						
Sloan----------------	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
	Too clayey	0.50				
SpB:						
Spinks---------------	Very limited		Very limited		Very limited	
	Seepage (bottom layer)	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00				
SpC:						
Spinks---------------	Very limited		Very limited		Very limited	
	Seepage (bottom layer)	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00	Slope	0.04	Slope	0.04
	Slope	0.04				
SpD:						
Spinks---------------	Very limited		Very limited		Very limited	
	Seepage (bottom layer)	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00	Slope	0.99	Slope	0.99
	Slope	0.99				
TdA:						
Tedrow---------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage (bottom layer)	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00				
TeA:						
Tedrow Variant-------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too sandy	0.50	Seepage	1.00	Too sandy	0.50
To:						
Toledo---------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00	Ponding	1.00	Too clayey	1.00
	Ponding	1.00			Hard to compact	1.00
					Ponding	1.00

Table 24.--Sanitary Facilities Part 2--Continued

Map symbol and soil name	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Tt:						
Toledo	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00	Ponding	1.00	Too clayey	1.00
	Ponding	1.00			Hard to compact	1.00
					Ponding	1.00
TuB2:						
Tuscola	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too sandy	1.00
	Too sandy	1.00			Depth to saturated zone	0.47
TuC2:						
Tuscola	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too sandy	1.00
	Too sandy	1.00	Slope	0.04	Depth to saturated zone	0.47
	Slope	0.04			Slope	0.04
Ud:						
Udorthents	Not rated		Not rated		Not rated	
Ur:						
Urban Land	Not rated		Not rated		Not rated	
VaA:						
Vaughnsville	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	1.00
	Too clayey	1.00			Depth to saturated zone	0.47
W:						
Water	Not rated		Not rated		Not rated	
Wa:						
Wabasha	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	1.00
	Too clayey	1.00			Hard to compact	1.00
Wc:						
Warners	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage (bottom layer)	1.00	Seepage	1.00		
Wf:						
Wauseon	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00	Seepage	1.00	Too clayey	1.00
	Ponding	1.00	Ponding	1.00	Hard to compact	1.00
					Ponding	1.00
Wg:						
Wauseon	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Seepage	1.00	Ponding	1.00
	Too clayey	0.50	Ponding	1.00	Too clayey	0.50

TABLE 25.--AGRICULTURAL WASTE MANAGEMENT

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text on page 201 for further explanation of ratings in this table.)

Map symbol and soil name	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ad:						
Adrian	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Low adsorption	1.00	Ponding	1.00
	Leaching	0.90	Ponding	1.00	Low adsorption	0.63
	Low adsorption	0.63				
ArB:						
Arkport	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Droughty	0.11	Too acid	0.21	Too acid	0.21
	Too acid	0.05	Droughty	0.11	Droughty	0.11
					Too steep for surface application	0.08
ArC:						
Arkport	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Too acid	0.05	Too acid	0.21	Too steep for surface application	1.00
	Slope	0.04	Slope	0.04	Too steep for sprinkler application	0.22
					Too acid	0.21
AsA:						
Aurand	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.74	Restricted permeability	0.60	Restricted permeability	0.60
	Filtering capacity	0.01	Filtering capacity	0.01	Filtering capacity	0.01
AtA:						
Aurand	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.74	Restricted permeability	0.60	Restricted permeability	0.60
BcA:						
Bixler	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00

Table 25.--Agricultural Waste Management--Continued

Map symbol and soil name	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
	Depth to saturated zone	0.68	Depth to saturated zone	0.68	Depth to saturated zone	0.68
Ca: Clay Pits	Not rated		Not rated		Not rated	
Ch: Cohoctah	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Flooding	1.00	Flooding	1.00	Flooding	0.60
	Leaching	0.70	Droughty	0.23	Droughty	0.23
	Droughty	0.23	Filtering capacity	0.01	Filtering capacity	0.01
	Filtering capacity	0.01				
Ck: Colwood	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Filtering capacity	0.01	Filtering capacity	0.01	Filtering capacity	0.01
Cm: Colwood	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Cn: Colwood	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Leaching	0.70	Restricted permeability	0.31	Restricted permeability	0.31
	Restricted permeability	0.41				
Co: Colwood	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Leaching	0.70				
Cu: Cut And Fill Land	Not rated		Not rated		Not rated	
DeA: Del Rey	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Too acid	0.05	Too acid	0.21	Too acid	0.21

Table 25.--Agricultural Waste Management--Continued

Map symbol and soil name	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
DfA:						
Del Rey	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Too acid	0.05	Too acid	0.21	Too acid	0.21
DuA:						
Digby	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too acid	0.01	Too acid	0.03	Too acid	0.03
DyA:						
Digby	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too acid	0.01	Too acid	0.03	Too acid	0.03
DzA:						
Digby	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Ee:						
Eel	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Flooding	1.00	Flooding	1.00	Flooding	1.00
FsA:						
Fulton	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Runoff	0.40	Too acid	0.07	Too acid	0.07
	Too acid	0.02				
FsB:						
Fulton	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Runoff	0.40	Too acid	0.07	Too steep for surface application	0.08
	Too acid	0.02			Too acid	0.07
FuA:						
Fulton	Very limited		Very limited		Very limited	

Table 25.--Agricultural Waste Management--Continued

Map symbol and soil name	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Runoff	0.40	Too acid	0.07	Too acid	0.07
	Too acid	0.02				
FuB:						
Fulton---------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Runoff	0.40	Too acid	0.07	Too steep for surface application	0.08
	Too acid	0.02			Too acid	0.07
FvA:						
Fulton Variant------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
GaA:						
Galen---------------	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone	0.86	Depth to saturated zone	0.86	Depth to saturated zone	0.86
	Too acid	0.02	Too acid	0.07	Too acid	0.07
GaB:						
Galen---------------	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone	0.86	Depth to saturated zone	0.86	Depth to saturated zone	0.86
	Too acid	0.02	Too acid	0.07	Too steep for surface application	0.08
					Too acid	0.07
GbB:						
Galen---------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too acid	0.02	Too acid	0.07	Too steep for surface application	0.08
	Filtering capacity	0.01	Filtering capacity	0.01	Too acid	0.07
					Filtering capacity	0.01
Gm:						
Genesee-------------	Very limited		Very limited		Somewhat limited	
	Flooding	1.00	Flooding	1.00	Flooding	0.60

Table 25.--Agricultural Waste Management--Continued

Map symbol and soil name	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
Go:						
Gilford	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Leaching	0.70	Droughty	0.35	Droughty	0.35
	Droughty	0.35				
Gr:						
Granby	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Droughty	0.99	Droughty	0.99	Droughty	0.99
	Leaching	0.90				
Gv:						
Gravel Pits	Not rated		Not rated		Not rated	
HaA:						
Haney	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too acid	0.05	Too acid	0.21	Too acid	0.21
HaB:						
Haney	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too acid	0.05	Too acid	0.21	Too acid	0.21
					Too steep for surface application	0.08
HdA:						
Haney	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too acid	0.05	Too acid	0.21	Too acid	0.21
HdB:						
Haney	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too acid	0.05	Too acid	0.21	Too acid	0.21

Table 25.--Agricultural Waste Management--Continued

Map symbol and soil name	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
					Too steep for surface application	0.08
HeC:						
Haney	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too acid	0.05	Too acid	0.21	Too steep for surface application	1.00
	Slope	0.04	Slope	0.04	Too steep for sprinkler application	0.22
					Too acid	0.21
Rawson	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.86	Depth to saturated zone	0.86	Too steep for surface application	1.00
	Slope	0.04	Too acid	0.07	Depth to saturated zone	0.86
	Too acid	0.02	Slope	0.04	Too steep for sprinkler application	0.22
					Too acid	0.07
HkA:						
Haskins	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too acid	0.01	Too acid	0.03	Too acid	0.03
HlA:						
Haskins	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too acid	0.01	Too acid	0.03	Too acid	0.03
HlB:						
Haskins	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too acid	0.18	Too acid	0.67	Too acid	0.67
					Too steep for surface application	0.08
HnA:						
Haskins	Very limited		Very limited		Very limited	

Table 25.--Agricultural Waste Management--Continued

Map symbol and soil name	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too acid	0.01	Too acid	0.03	Too acid	0.03
Ho:						
Hoytville-----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Leaching	0.50				
Hp:						
Hoytville-----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Hr:						
Hoytville-----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Hs:						
Hoytville-----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Hv:						
Hoytville-----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Leaching	0.50				
Hw:						
Hoytville Variant---	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Droughty	0.49	Droughty	0.49	Droughty	0.49
	Runoff	0.40				
KeA:						
Kibbie--------------	Very limited		Very limited		Very limited	

Table 25.--Agricultural Waste Management--Continued

Map symbol and soil name	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Filtering capacity	0.01	Filtering capacity	0.01	Filtering capacity	0.01
KfA:						
Kibbie	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too acid	0.01	Too acid	0.03	Too acid	0.03
KlA:						
Kibbie	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too acid	0.01	Too acid	0.03	Too acid	0.03
La:						
Latty	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Runoff	0.40	Too acid	0.03	Too acid	0.03
	Too acid	0.01				
Lb:						
Latty	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Runoff	0.40				
Le:						
Lenawee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Leaching	0.70	Restricted permeability	0.31	Restricted permeability	0.31
	Restricted permeability	0.41				
Lf:						
Lenawee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Leaching	0.70	Restricted permeability	0.31	Restricted permeability	0.31
	Restricted permeability	0.41				
LwB2:						
Lucas	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00

Table 25.--Agricultural Waste Management--Continued

Map symbol and soil name	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
	Depth to saturated zone	0.86	Depth to saturated zone	0.86	Depth to saturated zone	0.86
	Runoff	0.40	Too acid	0.55	Too acid	0.55
	Too acid	0.14			Too steep for surface application	0.08
LwC2:						
Lucas	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.86	Depth to saturated zone	0.86	Too steep for surface application	1.00
	Runoff	0.40	Too acid	0.42	Depth to saturated zone	0.86
	Too acid	0.11	Slope	0.04	Too acid	0.42
	Slope	0.04			Too steep for sprinkler application	0.22
LxC3:						
Lucas	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.86	Depth to saturated zone	0.86	Too steep for surface application	1.00
	Runoff	0.40	Too acid	0.55	Depth to saturated zone	0.86
	Too acid	0.14	Slope	0.04	Too acid	0.55
	Slope	0.04			Too steep for sprinkler application	0.22
LxE3:						
Lucas	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Too steep for surface application	1.00
	Slope	1.00	Slope	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.86	Depth to saturated zone	0.86	Too steep for sprinkler application	1.00
	Runoff	0.40	Too acid	0.67	Depth to saturated zone	0.86
	Too acid	0.18			Too acid	0.67
Mb:						
Mermill	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Aurand	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00

Table 25.--Agricultural Waste Management--Continued

Map symbol and soil name	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
	Restricted permeability	0.74	Restricted permeability	0.60	Restricted permeability	0.60
Mc:						
Mermill	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Leaching	0.70	Too acid	0.03	Too acid	0.03
	Too acid	0.01				
Md:						
Medway	Very limited		Very limited		Somewhat limited	
	Flooding	1.00	Flooding	1.00	Depth to saturated zone	0.86
	Depth to saturated zone	0.86	Depth to saturated zone	0.86	Flooding	0.60
Me:						
Mermill	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Leaching	0.70	Too acid	0.03	Too acid	0.03
	Too acid	0.01				
Mf:						
Mermill	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Leaching	0.70	Too acid	0.03	Too acid	0.03
	Too acid	0.01				
Mg:						
Mermill	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Leaching	0.70	Too acid	0.03	Too acid	0.03
	Too acid	0.01				
Mh:						
Millgrove	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Leaching	0.70	Too acid	0.03	Too acid	0.03
	Too acid	0.01				

Table 25.--Agricultural Waste Management--Continued

Map symbol and soil name	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
Mk:						
Millgrove	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Leaching	0.70	Too acid	0.03	Too acid	0.03
	Too acid	0.01				
NaA:						
Nappanee	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Runoff	0.40	Too acid	0.21	Too acid	0.21
	Too acid	0.05				
NaB:						
Nappanee	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Runoff	0.40	Too acid	0.21	Too acid	0.21
	Too acid	0.05			Too steep for surface application	0.08
NtA:						
Nappanee	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Runoff	0.40	Too acid	0.21	Too acid	0.21
	Too acid	0.05				
NtB:						
Nappanee	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Runoff	0.40	Too acid	0.21	Too acid	0.21
	Too acid	0.05			Too steep for surface application	0.08
NtB2:						
Nappanee	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Runoff	0.40	Too acid	0.21	Too acid	0.21

Table 25.--Agricultural Waste Management--Continued

Map symbol and soil name	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
	Too acid	0.05			Too steep for surface application	0.08
OaC:						
Oakville	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Droughty	1.00	Droughty	1.00
	Droughty	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Leaching	0.45	Too acid	0.67	Too steep for surface application	0.92
	Too acid	0.18			Too acid	0.67
					Too steep for sprinkler application	0.02
ObB:						
Oakville	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Droughty	0.62	Droughty	0.62	Droughty	0.62
	Leaching	0.45			Too steep for surface application	0.08
ObC:						
Oakville	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Droughty	0.54	Droughty	0.54	Too steep for surface application	1.00
	Leaching	0.45	Too acid	0.07	Droughty	0.54
	Slope	0.04	Slope	0.04	Too steep for sprinkler application	0.22
	Too acid	0.02			Too acid	0.07
OsB:						
Oshtemo	Somewhat limited		Somewhat limited		Somewhat limited	
	Too acid	0.18	Too acid	0.67	Too acid	0.67
	Filtering capacity	0.01	Filtering capacity	0.01	Too steep for surface application	0.08
					Filtering capacity	0.01
OtB:						
Ottokee	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Droughty	1.00	Droughty	1.00
	Droughty	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone	0.68	Depth to saturated zone	0.68	Depth to saturated zone	0.68
	Leaching	0.45	Too acid	0.42	Too acid	0.42
	Too acid	0.11				

Table 25.--Agricultural Waste Management--Continued

Map symbol and soil name	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
OuB:						
Ottokee	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone	0.68	Depth to saturated zone	0.68	Depth to saturated zone	0.68
	Leaching	0.45	Droughty	0.25	Droughty	0.25
	Droughty	0.25				
OzB:						
Ottokee	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone	0.84	Depth to saturated zone	0.84	Depth to saturated zone	0.84
	Leaching	0.45	Droughty	0.32	Droughty	0.32
	Droughty	0.32				
Spinks	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Leaching	0.45	Droughty	0.38	Droughty	0.38
	Droughty	0.38	Too acid	0.07	Too acid	0.07
	Too acid	0.02				
Pa:						
Paulding	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Runoff	0.40	Too acid	0.42	Too acid	0.42
	Too acid	0.11				
Pt:						
Pits, Quarry	Not rated		Not rated		Not rated	
RaB:						
Rawson	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.86	Depth to saturated zone	0.86	Depth to saturated zone	0.86
	Too acid	0.02	Too acid	0.07	Too steep for surface application	0.08
					Too acid	0.07
RdB:						
Rawson	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.86	Depth to saturated zone	0.86	Depth to saturated zone	0.86
	Too acid	0.02	Too acid	0.07	Too steep for surface application	0.08
					Too acid	0.07

Table 25.--Agricultural Waste Management--Continued

Map symbol and soil name	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
ReB:						
Rawson	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.86	Depth to saturated zone	0.86	Depth to saturated zone	0.86
	Restricted permeability	0.41	Restricted permeability	0.31	Restricted permeability	0.31
	Too acid	0.02	Too acid	0.07	Too steep for surface application	0.08
					Too acid	0.07
RfA:						
Rimer	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Droughty	0.50	Droughty	0.50	Droughty	0.50
	Too acid	0.02	Too acid	0.07	Too acid	0.07
RgA:						
Rimer	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Too acid	0.02	Too acid	0.07	Too acid	0.07
RhB:						
Rimer	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Droughty	0.27	Droughty	0.27	Droughty	0.27
	Too acid	0.02	Too acid	0.07	Too acid	0.07
Tedrow	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Droughty	0.09	Droughty	0.09	Droughty	0.09
RmA:						
Rimer	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00

Table 25.--Agricultural Waste Management--Continued

Map symbol and soil name	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
	Too acid	0.02	Too acid	0.07	Too acid	0.07
RoA:						
Roselms	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Runoff	0.40	Too acid	0.42	Too acid	0.42
	Too acid	0.11				
RrA:						
Roselms	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Runoff	0.40	Too acid	0.31	Too acid	0.31
	Too acid	0.08				
Rs:						
Ross	Very limited		Very limited		Somewhat limited	
	Flooding	1.00	Flooding	1.00	Flooding	0.60
	Depth to saturated zone	0.46	Depth to saturated zone	0.46	Depth to saturated zone	0.46
SaE3:						
St. Clair	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Too steep for sprinkler application	1.00
	Depth to saturated zone	0.86	Depth to saturated zone	0.86	Restricted permeability	1.00
	Runoff	0.40			Depth to saturated zone	0.86
SbB2:						
St. Clair	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Runoff	0.40	Too acid	0.21	Too acid	0.21
	Too acid	0.05			Too steep for surface application	0.08
SbC2:						
St. Clair	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Runoff	0.40	Too acid	0.07	Too steep for surface application	1.00

Table 25.--Agricultural Waste Management--Continued

Map symbol and soil name	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
	Slope	0.04	Slope	0.04	Too steep for sprinkler application	0.22
	Too acid	0.02			Too acid	0.07
SbD2:						
St. Clair-----------	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Too steep for surface application	1.00
	Slope	0.96	Slope	0.96	Restricted permeability	1.00
	Depth to saturated zone	0.95	Depth to saturated zone	0.95	Too steep for sprinkler application	0.98
	Runoff	0.40	Droughty	0.02	Depth to saturated zone	0.95
	Droughty	0.02			Droughty	0.02
SbE2:						
St. Clair-----------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Too steep for sprinkler application	1.00
	Depth to saturated zone	0.95	Depth to saturated zone	0.95	Restricted permeability	1.00
	Runoff	0.40	Droughty	0.02	Depth to saturated zone	0.95
	Droughty	0.02			Droughty	0.02
ScC3:						
St. Clair-----------	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Runoff	0.40	Too acid	0.21	Too steep for surface application	1.00
	Too acid	0.05	Slope	0.04	Too steep for sprinkler application	0.22
	Slope	0.04			Too acid	0.21
ScD3:						
St. Clair-----------	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Runoff	0.40	Too acid	0.21	Too steep for sprinkler application	1.00

Table 25.--Agricultural Waste Management--Continued

Map symbol and soil name	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
	Too acid	0.05			Too acid	0.21
ScE3: St. Clair	Very limited		Very limited		Very limited	
	Slope	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00	Too steep for surface application	1.00
	Runoff	0.40	Too acid	0.21	Too steep for sprinkler application	1.00
	Too acid	0.05			Too acid	0.21
ScF3: St. Clair	Very limited		Very limited		Very limited	
	Slope	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00	Too steep for surface application	1.00
	Runoff	0.40	Too acid	0.21	Too steep for sprinkler application	1.00
	Too acid	0.05			Too acid	0.21
SdB: Seward	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Droughty	0.60	Droughty	0.60	Droughty	0.60
	Depth to saturated zone	0.46	Depth to saturated zone	0.46	Depth to saturated zone	0.46
	Too acid	0.02	Too acid	0.07	Too steep for surface application	0.08
SdC: Seward	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Droughty	0.60	Droughty	0.60	Too steep for surface application	1.00
	Depth to saturated zone	0.46	Depth to saturated zone	0.46	Droughty	0.60
	Slope	0.04	Too acid	0.07	Depth to saturated zone	0.46
SdD: Seward	Very limited		Very limited		Very limited	

Table 25.--Agricultural Waste Management--Continued

Map symbol and soil name	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Too steep for surface application	1.00
	Slope	1.00	Slope	1.00	Restricted permeability	1.00
	Droughty	0.60	Droughty	0.60	Too steep for sprinkler application	1.00
	Depth to saturated zone	0.46	Depth to saturated zone	0.46	Droughty	0.60
SeB:						
Seward	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone	0.46	Depth to saturated zone	0.46	Depth to saturated zone	0.46
	Too acid	0.05	Too acid	0.21	Too acid	0.21
					Too steep for surface application	0.08
SeC:						
Seward	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone	0.46	Depth to saturated zone	0.46	Too steep for surface application	1.00
	Slope	0.04	Slope	0.04	Depth to saturated zone	0.46
	Too acid	0.01	Too acid	0.03	Too steep for sprinkler application	0.22
					Too acid	0.03
SfA:						
Shinrock Variant	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.41	Too acid	0.42	Too acid	0.42
	Too acid	0.11	Restricted permeability	0.31	Restricted permeability	0.31
Sh:						
Shoals	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Flooding	1.00	Flooding	1.00	Flooding	1.00
Sm:						
Sloan	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Flooding	1.00	Flooding	1.00	Flooding	1.00

Table 25.--Agricultural Waste Management--Continued

Map symbol and soil name	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Sn:						
Sloan	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Flooding	1.00	Flooding	1.00	Flooding	0.60
	Leaching	0.70				
So:						
Sloan	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Flooding	1.00	Flooding	1.00	Flooding	1.00
	Leaching	0.70				
SpB:						
Spinks	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Droughty	1.00	Droughty	1.00	Droughty	1.00
	Leaching	0.45	Too acid	0.21	Too acid	0.21
	Too acid	0.05			Too steep for surface application	0.08
SpC:						
Spinks	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Droughty	1.00	Droughty	1.00	Droughty	1.00
	Leaching	0.45	Too acid	0.21	Too steep for surface application	1.00
	Too acid	0.05	Slope	0.04	Too steep for sprinkler application	0.22
	Slope	0.04			Too acid	0.21
SpD:						
Spinks	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Droughty	1.00	Droughty	1.00	Too steep for surface application	1.00
	Slope	1.00	Slope	1.00	Droughty	1.00
	Leaching	0.45	Too acid	0.21	Too steep for sprinkler application	1.00
	Too acid	0.05			Too acid	0.21
TdA:						
Tedrow	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Droughty	0.96	Droughty	0.96	Droughty	0.96

Table 25.--Agricultural Waste Management--Continued

Map symbol and soil name	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
TeA:						
Tedrow Variant------	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Droughty	0.11	Droughty	0.11	Droughty	0.11
To:						
Toledo--------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Runoff	0.40				
Tt:						
Toledo--------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Runoff	0.40				
TuB2:						
Tuscola-------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.86	Depth to saturated zone	0.86	Depth to saturated zone	0.86
	Too acid	0.05	Too acid	0.21	Too acid	0.21
					Too steep for surface application	0.08
TuC2:						
Tuscola-------------	Somewhat limited		Somewhat limited		Very limited	
	Depth to saturated zone	0.86	Depth to saturated zone	0.86	Too steep for surface application	1.00
	Too acid	0.05	Too acid	0.21	Depth to saturated zone	0.86
	Slope	0.04	Slope	0.04	Too steep for sprinkler application	0.22
					Too acid	0.21
Ud:						
Udorthents----------	Not rated		Not rated		Not rated	
Ur:						
Urban Land----------	Not rated		Not rated		Not rated	
VaA:						
Vaughnsville--------	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.86	Depth to saturated zone	0.86	Depth to saturated zone	0.86

Table 25.--Agricultural Waste Management--Continued

Map symbol and soil name	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
W:						
Water	Not rated		Not rated		Not rated	
Wa:						
Wabasha	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Flooding	1.00	Flooding	1.00	Flooding	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Runoff	0.40				
Wc:						
Warners	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Low adsorption	1.00	Restricted permeability	1.00
	Runoff	0.40	Restricted permeability	1.00	Filtering capacity	0.01
	Filtering capacity	0.01	Filtering capacity	0.01		
Wf:						
Wauseon	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Leaching	0.70				
Wg:						
Wauseon	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Leaching	0.70	Filtering capacity	0.01	Filtering capacity	0.01
	Filtering capacity	0.01				

TABLE 26.--WATER MANAGEMENT PART 1

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text on page 202 for further explanation of ratings in this table.)

Map symbol and soil name	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ad:						
Adrian	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Thin layer	1.00	Cutbanks cave	0.50
			Ponding	1.00		
			Depth to saturated zone	1.00		
ArB:						
Arkport	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Thin layer	0.87	No ground water	1.00
ArC:						
Arkport	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Thin layer	0.36	No ground water	1.00
AsA:						
Aurand	Somewhat limited		Very limited		Very limited	
	Seepage	0.50	Thin layer	1.00	No ground water	1.00
			Depth to saturated zone	0.99		
AtA:						
Aurand	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Depth to saturated zone	0.99	No ground water	1.00
			Thin layer	0.93		
BcA:						
Bixler	Very limited		Somewhat limited		Somewhat limited	
	Seepage	1.00	Thin layer	0.84	Cutbanks cave	0.50
			Piping	0.50	Slow refill	0.28
			Depth to saturated zone	0.37	Depth to water	0.14
Ca:						
Clay Pits	Not rated		Not rated		Not rated	
Ch:						
Cohoctah	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	0.50
			Thin layer	0.53		
Ck:						
Colwood	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.50	Ponding	1.00	Cutbanks cave	0.50
			Depth to saturated zone	1.00		
			Thin layer	0.99		
			Piping	0.50		
Cm:						
Colwood	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.50	Ponding	1.00	Cutbanks cave	0.50

Table 26.--Water Management Part 1--Continued

Map symbol and soil name	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
			Depth to saturated zone	1.00		
			Thin layer	0.99		
			Piping	0.50		
Cn:						
Colwood	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.50	Ponding	1.00	Cutbanks cave	0.50
			Depth to saturated zone	1.00	Slow refill	0.28
			Thin layer	0.76		
Co:						
Colwood	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.50	Ponding	1.00	Cutbanks cave	0.50
			Depth to saturated zone	1.00	Slow refill	0.28
			Thin layer	0.76		
Cu:						
Cut And Fill Land	Not rated		Not rated		Not rated	
DeA:						
Del Rey	Not limited		Very limited		Very limited	
			Thin layer	1.00	Slow refill	1.00
			Depth to saturated zone	1.00	Cutbanks cave	0.10
DfA:						
Del Rey	Not limited		Very limited		Very limited	
			Thin layer	1.00	Slow refill	1.00
			Depth to saturated zone	1.00	Cutbanks cave	0.10
DuA:						
Digby	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Thin layer	1.00	Cutbanks cave	0.50
			Depth to saturated zone	1.00		
DyA:						
Digby	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Thin layer	1.00	Cutbanks cave	0.50
			Depth to saturated zone	1.00		
DzA:						
Digby	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Thin layer	1.00	Cutbanks cave	0.50
			Depth to saturated zone	1.00		
Ee:						
Eel	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Thin layer	1.00	Cutbanks cave	0.10
			Depth to saturated zone	1.00		
			Piping	0.50		
FsA:						
Fulton	Not limited		Very limited		Very limited	

Table 26.--Water Management Part 1--Continued

Map symbol and soil name	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
			Thin layer	1.00	No ground water	1.00
			Depth to saturated zone	0.99		
FsB:						
Fulton	Not limited		Very limited		Very limited	
			Thin layer	1.00	No ground water	1.00
			Depth to saturated zone	0.99		
FuA:						
Fulton	Not limited		Very limited		Very limited	
			Thin layer	1.00	No ground water	1.00
			Depth to saturated zone	0.99		
FuB:						
Fulton	Not limited		Very limited		Very limited	
			Thin layer	1.00	No ground water	1.00
			Depth to saturated zone	0.99		
FvA:						
Fulton Variant	Very limited		Very limited		Very limited	
	Seepage	1.00	Thin layer	1.00	Cutbanks cave	1.00
			Depth to saturated zone	1.00		
GaA:						
Galen	Very limited		Somewhat limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	0.71	Cutbanks cave	0.50
			Thin layer	0.29	Depth to water	0.06
GaB:						
Galen	Very limited		Somewhat limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	0.71	Cutbanks cave	0.50
			Thin layer	0.29	Depth to water	0.06
GbB:						
Galen	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Thin layer	1.00	Cutbanks cave	0.50
			Depth to saturated zone	1.00		
Gm:						
Genesee	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Thin layer	0.93	No ground water	1.00
Go:						
Gilford	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Ponding	1.00	Cutbanks cave	0.50
			Depth to saturated zone	1.00		
			Thin layer	0.93		
Gr:						
Granby	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Ponding	1.00	Cutbanks cave	0.50

Table 26.--Water Management Part 1--Continued

Map symbol and soil name	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
			Depth to saturated zone	1.00		
			Thin layer	0.57		
Gv:						
Gravel Pits	Not rated		Not rated		Not rated	
HaA:						
Haney	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	0.50
			Thin layer	0.74		
			Seepage	0.50		
HaB:						
Haney	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	0.50
			Thin layer	0.74		
			Seepage	0.50		
HdA:						
Haney	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	0.50
			Thin layer	0.74		
			Seepage	0.50		
HdB:						
Haney	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	0.50
			Thin layer	0.74		
			Seepage	0.50		
HeC:						
Haney	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	0.50
			Thin layer	0.74		
			Seepage	0.50		
Rawson	Somewhat limited		Very limited		Very limited	
	Seepage	0.50	Hard to compact	1.00	No ground water	1.00
			Thin layer	0.87		
			Depth to saturated zone	0.12		
HkA:						
Haskins	Somewhat limited		Very limited		Very limited	
	Seepage	0.50	Depth to saturated zone	1.00	No ground water	1.00
			Hard to compact	1.00		
			Thin layer	0.80		
HlA:						
Haskins	Somewhat limited		Very limited		Very limited	
	Seepage	0.50	Depth to saturated zone	1.00	No ground water	1.00
			Hard to compact	1.00		

Table 26.--Water Management Part 1--Continued

Map symbol and soil name	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
			Thin layer	0.80		
HlB:						
Haskins-------------	Somewhat limited		Very limited		Very limited	
	Seepage	0.50	Thin layer	1.00	No ground water	1.00
			Hard to compact	1.00		
			Depth to saturated zone	0.99		
HnA:						
Haskins-------------	Somewhat limited		Very limited		Very limited	
	Seepage	0.50	Thin layer	1.00	No ground water	1.00
			Depth to saturated zone	1.00		
			Hard to compact	1.00		
Ho:						
Hoytville-----------	Not limited		Very limited		Very limited	
			Thin layer	1.00	No ground water	1.00
			Ponding	1.00		
			Depth to saturated zone	1.00		
			Hard to compact	1.00		
Hp:						
Hoytville-----------	Not limited		Very limited		Very limited	
			Ponding	1.00	No ground water	1.00
			Depth to saturated zone	1.00		
			Thin layer	0.87		
Hr:						
Hoytville-----------	Not limited		Very limited		Very limited	
			Ponding	1.00	No ground water	1.00
			Depth to saturated zone	1.00		
			Hard to compact	1.00		
			Thin layer	0.57		
Hs:						
Hoytville-----------	Not limited		Very limited		Very limited	
			Ponding	1.00	No ground water	1.00
			Depth to saturated zone	1.00		
			Hard to compact	1.00		
			Thin layer	0.89		
Hv:						
Hoytville-----------	Not limited		Very limited		Very limited	
			Thin layer	1.00	No ground water	1.00
			Ponding	1.00		
			Depth to saturated zone	1.00		
			Hard to compact	1.00		
Hw:						
Hoytville Variant---	Not limited		Very limited		Very limited	
			Ponding	1.00	No ground water	1.00
			Depth to saturated zone	1.00		
			Hard to compact	1.00		

Table 26.--Water Management Part 1--Continued

Map symbol and soil name	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
			Thin layer	0.96		
KeA:						
Kibbie	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.50	Thin layer	1.00	Cutbanks cave	0.50
			Depth to saturated zone	1.00		
KfA:						
Kibbie	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.50	Depth to saturated zone	1.00	Cutbanks cave	0.50
			Thin layer	0.87	Slow refill	0.28
KlA:						
Kibbie	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.50	Depth to saturated zone	1.00	Cutbanks cave	0.50
			Thin layer	0.91	Slow refill	0.28
La:						
Latty	Not limited		Very limited		Somewhat limited	
			Ponding	1.00	Slow refill	0.96
			Depth to saturated zone	1.00	Cutbanks cave	0.10
			Hard to compact	1.00		
			Thin layer	0.89		
Lb:						
Latty	Not limited		Very limited		Very limited	
			Ponding	1.00	No ground water	1.00
			Depth to saturated zone	1.00		
			Hard to compact	1.00		
			Thin layer	0.83		
Le:						
Lenawee	Not limited		Very limited		Somewhat limited	
			Ponding	1.00	Cutbanks cave	0.50
			Depth to saturated zone	1.00	Slow refill	0.28
			Thin layer	0.83		
Lf:						
Lenawee	Not limited		Very limited		Somewhat limited	
			Ponding	1.00	Slow refill	0.96
			Depth to saturated zone	1.00	Cutbanks cave	0.50
			Thin layer	0.83		
LwB2:						
Lucas	Not limited		Very limited		Very limited	
			Hard to compact	1.00	No ground water	1.00
			Thin layer	0.84		
			Depth to saturated zone	0.12		
LwC2:						
Lucas	Not limited		Very limited		Very limited	
			Hard to compact	1.00	No ground water	1.00
			Thin layer	0.84		

Table 26.--Water Management Part 1--Continued

Map symbol and soil name	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
			Depth to saturated zone	0.12		
LxC3:						
Lucas	Not limited		Very limited		Very limited	
			Hard to compact	1.00	No ground water	1.00
			Thin layer	0.84		
			Depth to saturated zone	0.12		
LxE3:						
Lucas	Somewhat limited		Very limited		Very limited	
	Slope	0.45	Hard to compact	1.00	No ground water	1.00
			Thin layer	0.84		
			Depth to saturated zone	0.12		
Mb:						
Mermill	Somewhat limited		Very limited		Very limited	
	Seepage	0.50	Ponding	1.00	No ground water	1.00
			Depth to saturated zone	1.00		
			Thin layer	0.87		
			Piping	0.50		
Aurand	Somewhat limited		Very limited		Very limited	
	Seepage	0.50	Thin layer	1.00	No ground water	1.00
			Depth to saturated zone	0.99		
Mc:						
Mermill	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.50	Thin layer	1.00	Slow refill	0.28
			Ponding	1.00	Cutbanks cave	0.10
			Depth to saturated zone	1.00		
			Hard to compact	1.00		
Md:						
Medway	Somewhat limited		Somewhat limited		Somewhat limited	
	Seepage	0.50	Depth to saturated zone	0.71	Slow refill	0.28
			Thin layer	0.61	Cutbanks cave	0.10
			Piping	0.50	Depth to water	0.06
Me:						
Mermill	Somewhat limited		Very limited		Very limited	
	Seepage	0.50	Ponding	1.00	No ground water	1.00
			Depth to saturated zone	1.00		
			Thin layer	0.96		
Mf:						
Mermill	Somewhat limited		Very limited		Very limited	
	Seepage	0.50	Ponding	1.00	No ground water	1.00
			Depth to saturated zone	1.00		
			Thin layer	0.96		
Mg:						
Mermill	Somewhat limited		Very limited		Very limited	

Table 26.--Water Management Part 1--Continued

Map symbol and soil name	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
	Seepage	0.50	Ponding	1.00	No ground water	1.00
			Depth to saturated zone	1.00		
			Thin layer	0.96		
Mh:						
Millgrove-----------	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Ponding	1.00	Cutbanks cave	0.50
			Depth to saturated zone	1.00		
			Thin layer	0.99		
Mk:						
Millgrove-----------	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Ponding	1.00	Cutbanks cave	0.50
			Depth to saturated zone	1.00		
			Thin layer	0.99		
NaA:						
Nappanee------------	Not limited		Very limited		Very limited	
			Depth to saturated zone	1.00	No ground water	1.00
			Thin layer	0.80		
NaB:						
Nappanee------------	Not limited		Very limited		Very limited	
			Depth to saturated zone	1.00	No ground water	1.00
			Thin layer	0.80		
NtA:						
Nappanee------------	Not limited		Very limited		Very limited	
			Depth to saturated zone	1.00	No ground water	1.00
			Thin layer	0.80		
NtB:						
Nappanee------------	Not limited		Very limited		Very limited	
			Depth to saturated zone	1.00	No ground water	1.00
			Thin layer	0.80		
NtB2:						
Nappanee------------	Not limited		Very limited		Very limited	
			Depth to saturated zone	1.00	No ground water	1.00
			Thin layer	0.80		
OaC:						
Oakville------------	Very limited		Not limited		Very limited	
	Seepage	1.00			No ground water	1.00
ObB:						
Oakville------------	Very limited		Not limited		Very limited	
	Seepage	1.00			No ground water	1.00
ObC:						
Oakville------------	Very limited		Very limited		Very limited	
	Seepage	1.00	Thin layer	1.00	No ground water	1.00

Table 26.--Water Management Part 1--Continued

Map symbol and soil name	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
			Seepage	0.72		
OsB:						
Oshtemo	Very limited		Very limited		Very limited	
	Seepage	1.00	Thin layer	1.00	No ground water	1.00
OtB:						
Ottokee	Very limited		Somewhat limited		Somewhat limited	
	Seepage	1.00	Thin layer	0.43	Cutbanks cave	0.50
			Depth to saturated zone	0.37	Depth to water	0.14
OuB:						
Ottokee	Very limited		Somewhat limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	0.37	Cutbanks cave	0.50
			Thin layer	0.26	Depth to water	0.14
OzB:						
Ottokee	Very limited		Somewhat limited		Somewhat limited	
	Seepage	1.00	Thin layer	0.80	Cutbanks cave	0.50
			Depth to saturated zone	0.67	Depth to water	0.07
Spinks	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Thin layer	0.63	No ground water	1.00
Pa:						
Paulding	Not limited		Very limited		Very limited	
			Ponding	1.00	Slow refill	1.00
			Depth to saturated zone	1.00	Cutbanks cave	0.10
			Hard to compact	1.00		
			Thin layer	0.59		
Pt:						
Pits, Quarry	Not rated		Not rated		Not rated	
RaB:						
Rawson	Somewhat limited		Very limited		Very limited	
	Seepage	0.50	Hard to compact	1.00	No ground water	1.00
			Thin layer	0.87		
			Depth to saturated zone	0.12		
RdB:						
Rawson	Somewhat limited		Very limited		Very limited	
	Seepage	0.50	Hard to compact	1.00	No ground water	1.00
			Thin layer	0.87		
			Depth to saturated zone	0.12		
ReB:						
Rawson	Somewhat limited		Very limited		Very limited	
	Seepage	0.50	Thin layer	1.00	No ground water	1.00
			Depth to saturated zone	0.12		
RfA:						
Rimer	Very limited		Very limited		Very limited	

Table 26.--Water Management Part 1--Continued

Map symbol and soil name	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
	Seepage	1.00	Depth to saturated zone	1.00	No ground water	1.00
			Hard to compact	1.00		
			Thin layer	0.46		
RgA:						
Rimer	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Thin layer	0.97	No ground water	1.00
			Depth to saturated zone	0.70		
RhB:						
Rimer	Very limited		Very limited		Very limited	
	Seepage	1.00	Thin layer	1.00	No ground water	1.00
			Depth to saturated zone	0.99		
Tedrow	Very limited		Very limited		Very limited	
	Seepage	1.00	Thin layer	1.00	No ground water	1.00
			Depth to saturated zone	0.99		
RmA:						
Rimer	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	No ground water	1.00
			Thin layer	0.83		
RoA:						
Roselms	Not limited		Very limited		Very limited	
			Depth to saturated zone	1.00	No ground water	1.00
			Hard to compact	1.00		
			Thin layer	0.84		
RrA:						
Roselms	Not limited		Very limited		Very limited	
			Thin layer	1.00	No ground water	1.00
			Hard to compact	1.00		
			Depth to saturated zone	0.99		
Rs:						
Ross	Somewhat limited		Somewhat limited		Somewhat limited	
	Seepage	0.50	Thin layer	0.66	Slow refill	0.28
			Depth to saturated zone	0.14	Depth to water	0.24
					Cutbanks cave	0.10
SaE3:						
St. Clair	Somewhat limited		Very limited		Very limited	
	Slope	0.36	Hard to compact	1.00	No ground water	1.00
			Thin layer	0.74		
			Depth to saturated zone	0.12		
SbB2:						
St. Clair	Not limited		Very limited		Very limited	
			Hard to compact	1.00	No ground water	1.00
			Thin layer	0.76		

Table 26.--Water Management Part 1--Continued

Map symbol and soil name	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
			Depth to saturated zone	0.67		
SbC2:						
St. Clair	Not limited		Very limited		Very limited	
			Hard to compact	1.00	No ground water	1.00
			Thin layer	0.76		
			Depth to saturated zone	0.67		
SbD2:						
St. Clair	Somewhat limited		Very limited		Very limited	
	Slope	0.02	Thin layer	1.00	No ground water	1.00
			Depth to saturated zone	0.25		
SbE2:						
St. Clair	Somewhat limited		Very limited		Very limited	
	Slope	0.12	Thin layer	1.00	No ground water	1.00
			Depth to saturated zone	0.25		
ScC3:						
St. Clair	Not limited		Very limited		Very limited	
			Hard to compact	1.00	No ground water	1.00
			Thin layer	0.76		
			Depth to saturated zone	0.67		
ScD3:						
St. Clair	Somewhat limited		Very limited		Very limited	
	Slope	0.03	Hard to compact	1.00	No ground water	1.00
			Thin layer	0.76		
			Depth to saturated zone	0.67		
ScE3:						
St. Clair	Somewhat limited		Very limited		Very limited	
	Slope	0.18	Hard to compact	1.00	No ground water	1.00
			Thin layer	0.76		
			Depth to saturated zone	0.67		
ScF3:						
St. Clair	Somewhat limited		Very limited		Very limited	
	Slope	0.72	Hard to compact	1.00	No ground water	1.00
			Thin layer	0.84		
			Depth to saturated zone	0.67		
SdB:						
Seward	Very limited		Very limited		Very limited	
	Seepage	1.00	Thin layer	1.00	No ground water	1.00
			Hard to compact	1.00		
SdC:						
Seward	Very limited		Very limited		Very limited	
	Seepage	1.00	Thin layer	1.00	No ground water	1.00
			Hard to compact	1.00		

Table 26.--Water Management Part 1--Continued

Map symbol and soil name	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
SdD:						
Seward	Very limited		Very limited		Very limited	
	Seepage	1.00	Thin layer	1.00	No ground water	1.00
	Slope	0.03	Hard to compact	1.00		
SeB:						
Seward	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Thin layer	0.24	No ground water	1.00
SeC:						
Seward	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Thin layer	0.24	No ground water	1.00
SfA:						
Shinrock Variant	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Depth to saturated zone	0.67	No ground water	1.00
			Thin layer	0.57		
			Seepage	0.50		
Sh:						
Shoals	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.50	Thin layer	1.00	Slow refill	0.28
			Depth to saturated zone	1.00	Cutbanks cave	0.10
Sm:						
Sloan	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.25	Ponding	1.00	Slow refill	0.28
			Depth to saturated zone	1.00	Cutbanks cave	0.10
			Thin layer	0.87		
			Piping	0.50		
Sn:						
Sloan	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.25	Depth to saturated zone	1.00	Slow refill	0.28
			Thin layer	0.96	Cutbanks cave	0.10
			Piping	0.50		
So:						
Sloan	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.25	Depth to saturated zone	1.00	Slow refill	0.28
			Thin layer	0.96	Cutbanks cave	0.10
			Piping	0.50		
SpB:						
Spinks	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Thin layer	0.09	No ground water	1.00
SpC:						
Spinks	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Thin layer	0.09	No ground water	1.00
SpD:						
Spinks	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Thin layer	0.09	No ground water	1.00
	Slope	0.03				

Table 26.--Water Management Part 1--Continued

Map symbol and soil name	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
TdA:						
Tedrow	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Thin layer	1.00	Cutbanks cave	0.50
			Depth to saturated zone	1.00		
TeA:						
Tedrow Variant	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Thin layer	1.00	Cutbanks cave	0.50
			Depth to saturated zone	1.00		
To:						
Toledo	Not limited		Very limited		Somewhat limited	
			Ponding	1.00	Slow refill	0.96
			Depth to saturated zone	1.00	Cutbanks cave	0.10
			Hard to compact	1.00		
			Thin layer	0.53		
Tt:						
Toledo	Not limited		Very limited		Somewhat limited	
			Ponding	1.00	Slow refill	0.96
			Depth to saturated zone	1.00	Cutbanks cave	0.10
			Hard to compact	1.00		
			Thin layer	0.53		
TuB2:						
Tuscola	Somewhat limited		Somewhat limited		Somewhat limited	
	Seepage	0.50	Depth to saturated zone	0.71	Cutbanks cave	0.50
			Thin layer	0.63	Slow refill	0.28
					Depth to water	0.06
TuC2:						
Tuscola	Somewhat limited		Somewhat limited		Somewhat limited	
	Seepage	0.50	Depth to saturated zone	0.71	Cutbanks cave	0.50
			Thin layer	0.63	Slow refill	0.28
					Depth to water	0.06
Ud:						
Udorthents	Not rated		Not rated		Not rated	
Ur:						
Urban Land	Not rated		Not rated		Not rated	
VaA:						
Vaughnsville	Somewhat limited		Very limited		Very limited	
	Seepage	0.50	Thin layer	1.00	Slow refill	1.00
			Depth to saturated zone	0.71	Cutbanks cave	0.10
					Depth to water	0.06
W:						
Water	Not rated		Not rated		Not rated	
Wa:						
Wabasha	Not limited		Very limited		Somewhat limited	

Table 26.--Water Management Part 1--Continued

Map symbol and soil name	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
			Depth to saturated zone	1.00	Slow refill	0.96
			Hard to compact	1.00	Cutbanks cave	0.10
			Thin layer	0.93		
Wc:						
Warners	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Thin layer	1.00	Cutbanks cave	0.50
			Depth to saturated zone	1.00		
Wf:						
Wauseon	Very limited		Very limited		Very limited	
	Seepage	1.00	Thin layer	1.00	No ground water	1.00
			Ponding	1.00		
			Depth to saturated zone	1.00		
			Hard to compact	1.00		
Wg:						
Wauseon	Very limited		Very limited		Very limited	
	Seepage	1.00	Ponding	1.00	No ground water	1.00
			Depth to saturated zone	1.00		
			Thin layer	0.74		
			Piping	0.50		

TABLE 27.--WATER MANAGEMENT PART 2

(The information in this table indicates the dominant soil condition but does not eliminate the need for on-site investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text on page 202 for further explanation of ratings in this table.)

Map symbol and soil name	Constructing grassed waterways: Rating class and limiting features	Value	Constructing terraces and diversions: Rating class and limiting features	Value	Drainage: Rating class and limiting features	Value
Ad:						
Adrian	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
			Ponding	1.00	Frost action	1.00
			Too sandy	1.00	Cutbanks cave	1.00
					Subsidence	1.00
ArB:						
Arkport	Very limited		Not limited		Very limited	
	Droughty	1.00			Depth to saturated zone	1.00
					Slope	0.04
ArC:						
Arkport	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Depth to saturated zone	1.00
					Slope	0.96
AsA:						
Aurand	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
	Restricted permeability	0.40	Restricted permeability	0.40	Restricted permeability	0.40
AtA:						
Aurand	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
	Restricted permeability	0.40	Restricted permeability	0.40	Restricted permeability	0.40
BcA:						
Bixler	Somewhat limited		Very limited		Very limited	
	Depth to saturated zone	0.24	Depth to saturated zone	1.00	Frost action	1.00
Ca:						
Clay Pits	Not rated		Not rated		Not rated	
Ch:						
Cohoctah	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
	Droughty	1.00			Flooding	1.00
Ck:						
Colwood	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
			Ponding	1.00	Frost action	1.00

Table 27.--Water Management Part 2--Continued

Map symbol and soil name	Constructing grassed waterways: Rating class and limiting features	Value	Constructing terraces and diversions: Rating class and limiting features	Value	Drainage: Rating class and limiting features	Value
Cm:						
Colwood	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
			Ponding	1.00	Frost action	1.00
Cn:						
Colwood	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Restricted permeability	0.22	Ponding	1.00	Frost action	1.00
			Restricted permeability	0.22	Restricted permeability	0.22
Co:						
Colwood	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
			Ponding	1.00	Frost action	1.00
Cu:						
Cut And Fill Land	Not rated		Not rated		Not rated	
DeA:						
Del Rey	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Restricted permeability	0.91
	Restricted permeability	0.91	Restricted permeability	0.91		
DfA:						
Del Rey	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Restricted permeability	0.91
	Restricted permeability	0.91	Restricted permeability	0.91		
DuA:						
Digby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
DyA:						
Digby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
DzA:						
Digby	Somewhat limited		Very limited		Very limited	
	Depth to saturated zone	0.96	Depth to saturated zone	1.00	Frost action	1.00
Ee:						
Eel	Somewhat limited		Very limited		Very limited	
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Frost action	1.00
					Flooding	1.00

Table 27.--Water Management Part 2--Continued

Map symbol and soil name	Constructing grassed waterways: Rating class and limiting features	Value	Constructing terraces and diversions: Rating class and limiting features	Value	Drainage: Rating class and limiting features	Value
FsA:						
Fulton	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Restricted permeability	0.94
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
	Restricted permeability	0.94	Restricted permeability	0.94		
FsB:						
Fulton	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Restricted permeability	0.94
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope	0.04
	Restricted permeability	0.94	Restricted permeability	0.94		
FuA:						
Fulton	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Restricted permeability	0.94
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
	Restricted permeability	0.94	Restricted permeability	0.94		
FuB:						
Fulton	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Restricted permeability	0.91
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope	0.04
	Restricted permeability	0.91	Restricted permeability	0.91		
FvA:						
Fulton Variant	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
	Restricted permeability	0.91	Restricted permeability	0.91	Restricted permeability	0.91
GaA:						
Galen	Somewhat limited		Very limited		Very limited	
	Depth to saturated zone	0.47	Too sandy	1.00	Cutbanks cave	1.00
			Depth to saturated zone	1.00		
GaB:						
Galen	Somewhat limited		Very limited		Very limited	
	Depth to saturated zone	0.47	Too sandy	1.00	Cutbanks cave	1.00
			Depth to saturated zone	1.00	Slope	0.04
GbB:						
Galen	Somewhat limited		Very limited		Very limited	
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Cutbanks cave	1.00

Table 27.--Water Management Part 2--Continued

Map symbol and soil name	Constructing grassed waterways		Constructing terraces and diversions		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
			Too sandy	1.00	Slope	0.04
Gm:						
Genesee	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Flooding	1.00
					Depth to saturated zone	1.00
Go:						
Gilford	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
			Ponding	1.00	Frost action	1.00
			Too sandy	1.00	Cutbanks cave	1.00
Gr:						
Granby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Droughty	1.00	Ponding	1.00	Cutbanks cave	1.00
			Too sandy	1.00		
Gv:						
Gravel Pits	Not rated		Not rated		Not rated	
HaA:						
Haney	Somewhat limited		Very limited		Very limited	
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Frost action	1.00
			Too sandy	1.00	Cutbanks cave	1.00
HaB:						
Haney	Somewhat limited		Very limited		Very limited	
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Frost action	1.00
			Too sandy	1.00	Cutbanks cave	1.00
					Slope	0.04
HdA:						
Haney	Somewhat limited		Very limited		Very limited	
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Frost action	1.00
			Too sandy	1.00	Cutbanks cave	1.00
HdB:						
Haney	Somewhat limited		Very limited		Very limited	
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Frost action	1.00
			Too sandy	1.00	Cutbanks cave	1.00
					Slope	0.04
HeC:						
Haney	Very limited		Very limited		Very limited	
	Slope	1.00	Depth to saturated zone	1.00	Frost action	1.00
	Depth to saturated zone	0.95	Too sandy	1.00	Cutbanks cave	1.00
			Slope	1.00	Slope	0.96
Rawson	Very limited		Very limited		Very limited	

Table 27.--Water Management Part 2--Continued

Map symbol and soil name	Constructing grassed waterways: Rating class and limiting features	Value	Constructing terraces and diversions: Rating class and limiting features	Value	Drainage: Rating class and limiting features	Value
	Slope	1.00	Slope	1.00	Restricted permeability	0.99
	Restricted permeability	0.99	Depth to saturated zone	1.00	Slope	0.96
	Depth to saturated zone	0.47	Restricted permeability	0.99		
HkA:						
Haskins	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
	Restricted permeability	0.99	Restricted permeability	0.99	Restricted permeability	0.99
HlA:						
Haskins	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Restricted permeability	0.99
	Restricted permeability	0.99	Restricted permeability	0.99		
HlB:						
Haskins	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Restricted permeability	0.99
	Restricted permeability	0.99	Restricted permeability	0.99	Slope	0.04
HnA:						
Haskins	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
	Restricted permeability	0.99	Restricted permeability	0.99	Restricted permeability	0.99
Ho:						
Hoytville	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Restricted permeability	0.91	Ponding	1.00	Frost action	1.00
			Restricted permeability	0.91	Restricted permeability	0.91
Hp:						
Hoytville	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Restricted permeability	0.22	Ponding	1.00	Frost action	1.00
			Restricted permeability	0.22	Restricted permeability	0.22
Hr:						
Hoytville	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Restricted permeability	0.22	Ponding	1.00	Frost action	1.00

Table 27.--Water Management Part 2--Continued

Map symbol and soil name	Constructing grassed waterways: Rating class and limiting features	Value	Constructing terraces and diversions: Rating class and limiting features	Value	Drainage: Rating class and limiting features	Value
			Restricted permeability	0.22	Restricted permeability	0.22
Hs:						
Hoytville-----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Restricted permeability	0.22	Ponding	1.00	Frost action	1.00
			Restricted permeability	0.22	Restricted permeability	0.22
Hv:						
Hoytville-----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Restricted permeability	0.91	Ponding	1.00	Frost action	1.00
			Restricted permeability	0.91	Restricted permeability	0.91
Hw:						
Hoytville Variant---	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Restricted permeability	0.91	Ponding	1.00	Frost action	1.00
			Restricted permeability	0.91	Restricted permeability	0.91
KeA:						
Kibbie--------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
			Too sandy	1.00	Cutbanks cave	1.00
KfA:						
Kibbie--------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
			Too sandy	1.00		
KlA:						
Kibbie--------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
			Too sandy	1.00		
La:						
Latty---------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Restricted permeability	0.91	Ponding	1.00	Restricted permeability	0.91
			Restricted permeability	0.91		
Lb:						
Latty---------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00

Table 27.--Water Management Part 2--Continued

Map symbol and soil name	Constructing grassed waterways		Constructing terraces and diversions		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
	Restricted permeability	0.91	Ponding	1.00	Restricted permeability	0.91
			Restricted permeability	0.91		
Le: Lenawee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Restricted permeability	0.22	Ponding	1.00	Frost action	1.00
			Restricted permeability	0.22	Restricted permeability	0.22
Lf: Lenawee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Restricted permeability	0.22	Ponding	1.00	Frost action	1.00
			Restricted permeability	0.22	Restricted permeability	0.22
LwB2: Lucas	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Restricted permeability	0.94
	Restricted permeability	0.94	Depth to saturated zone	1.00	Slope	0.04
	Depth to saturated zone	0.47	Restricted permeability	0.94		
LwC2: Lucas	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	0.96
	Slope	1.00	Slope	1.00	Restricted permeability	0.94
	Restricted permeability	0.94	Depth to saturated zone	1.00		
	Depth to saturated zone	0.47	Restricted permeability	0.94		
LxC3: Lucas	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	0.96
	Restricted permeability	0.94	Depth to saturated zone	1.00	Restricted permeability	0.94
	Depth to saturated zone	0.47	Restricted permeability	0.94		
LxE3: Lucas	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.94	Depth to saturated zone	1.00	Restricted permeability	0.94
	Depth to saturated zone	0.47	Restricted permeability	0.94		
Mb: Mermill	Very limited		Very limited		Very limited	

Table 27.--Water Management Part 2--Continued

Map symbol and soil name	Constructing grassed waterways: Rating class and limiting features	Value	Constructing terraces and diversions: Rating class and limiting features	Value	Drainage: Rating class and limiting features	Value
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Restricted permeability	0.94	Ponding	1.00	Frost action	1.00
			Restricted permeability	0.94	Restricted permeability	0.94
Aurand	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
	Restricted permeability	0.40	Restricted permeability	0.40	Restricted permeability	0.40
Mc:						
Mermill	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
	Restricted permeability	0.99	Ponding	1.00	Restricted permeability	0.99
			Restricted permeability	0.99		
Md:						
Medway	Somewhat limited		Very limited		Very limited	
	Depth to saturated zone	0.47	Depth to saturated zone	1.00	Frost action	1.00
					Flooding	1.00
Me:						
Mermill	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
			Ponding	1.00	Frost action	1.00
Mf:						
Mermill	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
			Ponding	1.00	Frost action	1.00
Mg:						
Mermill	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
			Ponding	1.00	Frost action	1.00
Mh:						
Millgrove	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
			Ponding	1.00	Frost action	1.00
Mk:						
Millgrove	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
			Ponding	1.00	Frost action	1.00
NaA:						
Nappanee	Very limited		Very limited		Very limited	

Table 27.--Water Management Part 2--Continued

Map symbol and soil name	Constructing grassed waterways: Rating class and limiting features	Value	Constructing terraces and diversions: Rating class and limiting features	Value	Drainage: Rating class and limiting features	Value
	Water erosion	1.00	Water erosion	1.00	Restricted permeability	0.99
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
	Restricted permeability	0.99	Restricted permeability	0.99		
NaB:						
Nappanee	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Restricted permeability	0.99
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope	0.04
	Restricted permeability	0.99	Restricted permeability	0.99		
NtA:						
Nappanee	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Restricted permeability	0.99
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
	Restricted permeability	0.99	Restricted permeability	0.99		
NtB:						
Nappanee	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Restricted permeability	0.99
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope	0.04
	Restricted permeability	0.99	Restricted permeability	0.99		
NtB2:						
Nappanee	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Restricted permeability	0.99
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope	0.04
	Restricted permeability	0.99	Restricted permeability	0.99		
OaC:						
Oakville	Very limited		Very limited		Very limited	
	Droughty	1.00	Too sandy	1.00	Cutbanks cave	1.00
					Depth to saturated zone	1.00
					Slope	0.63
ObB:						
Oakville	Very limited		Very limited		Very limited	
	Droughty	1.00	Too sandy	1.00	Cutbanks cave	1.00
					Depth to saturated zone	1.00
					Slope	0.04
ObC:						
Oakville	Very limited		Very limited		Very limited	
	Droughty	1.00	Too sandy	1.00	Cutbanks cave	1.00

Table 27.--Water Management Part 2--Continued

Map symbol and soil name	Constructing grassed waterways: Rating class and limiting features	Value	Constructing terraces and diversions: Rating class and limiting features	Value	Drainage: Rating class and limiting features	Value
	Slope	1.00	Slope	1.00	Depth to saturated zone	1.00
					Slope	0.96
OsB:						
Oshtemo	Not limited		Very limited		Very limited	
			Too sandy	1.00	Depth to saturated zone	1.00
					Slope	0.04
OtB:						
Ottokee	Very limited		Very limited		Very limited	
	Droughty	1.00	Too sandy	1.00	Cutbanks cave	1.00
	Depth to saturated zone	0.24	Depth to saturated zone	1.00		
OuB:						
Ottokee	Very limited		Very limited		Very limited	
	Droughty	1.00	Too sandy	1.00	Cutbanks cave	1.00
	Depth to saturated zone	0.24	Depth to saturated zone	1.00		
OzB:						
Ottokee	Very limited		Very limited		Very limited	
	Droughty	1.00	Too sandy	1.00	Cutbanks cave	1.00
	Depth to saturated zone	0.44	Depth to saturated zone	1.00		
Spinks	Very limited		Very limited		Very limited	
	Droughty	1.00	Too sandy	1.00	Cutbanks cave	1.00
					Depth to saturated zone	1.00
Pa:						
Paulding	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Restricted permeability	0.99	Ponding	1.00	Restricted permeability	0.99
			Restricted permeability	0.99		
Pt:						
Pits, Quarry	Not rated		Not rated		Not rated	
RaB:						
Rawson	Somewhat limited		Very limited		Very limited	
	Restricted permeability	0.99	Depth to saturated zone	1.00	Restricted permeability	0.99
	Depth to saturated zone	0.47	Restricted permeability	0.99	Slope	0.04
RdB:						
Rawson	Somewhat limited		Very limited		Very limited	
	Restricted permeability	0.99	Depth to saturated zone	1.00	Restricted permeability	0.99
	Depth to saturated zone	0.47	Restricted permeability	0.99	Slope	0.04
ReB:						
Rawson	Somewhat limited		Very limited		Somewhat limited	

Table 27.--Water Management Part 2--Continued

Map symbol and soil name	Constructing grassed waterways: Rating class and limiting features	Value	Constructing terraces and diversions: Rating class and limiting features	Value	Drainage: Rating class and limiting features	Value
	Depth to saturated zone	0.47	Depth to saturated zone	1.00	Restricted permeability	0.22
	Restricted permeability	0.22	Restricted permeability	0.22	Slope	0.04
RfA:						
Rimer	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
	Droughty	1.00	Restricted permeability	0.99	Restricted permeability	0.99
	Restricted permeability	0.99				
RgA:						
Rimer	Somewhat limited		Very limited		Very limited	
	Depth to saturated zone	0.96	Depth to saturated zone	1.00	Frost action	1.00
	Restricted permeability	0.94	Restricted permeability	0.94	Restricted permeability	0.94
RhB:						
Rimer	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
	Droughty	1.00	Restricted permeability	0.94	Restricted permeability	0.94
	Restricted permeability	0.94				
Tedrow	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Restricted permeability	0.94
	Droughty	1.00	Restricted permeability	0.94		
	Restricted permeability	0.94				
RmA:						
Rimer	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
	Droughty	1.00	Restricted permeability	0.91	Restricted permeability	0.91
	Restricted permeability	0.91				
RoA:						
Roselms	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Restricted permeability	0.99
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
	Restricted permeability	0.99	Restricted permeability	0.99		
RrA:						
Roselms	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Restricted permeability	0.99

Table 27.--Water Management Part 2--Continued

Map symbol and soil name	Constructing grassed waterways		Constructing terraces and diversions		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
	Restricted permeability	0.99	Restricted permeability	0.99		
Rs:						
Ross	Somewhat limited		Not limited		Very limited	
	Depth to saturated zone	0.11			Flooding	1.00
					Depth to saturated zone	1.00
SaE3:						
St. Clair	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.94	Depth to saturated zone	1.00	Restricted permeability	0.94
	Depth to saturated zone	0.47	Restricted permeability	0.94		
SbB2:						
St. Clair	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Restricted permeability	0.99
	Restricted permeability	0.99	Depth to saturated zone	1.00	Slope	0.04
	Depth to saturated zone	0.95	Restricted permeability	0.99		
SbC2:						
St. Clair	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Restricted permeability	0.99
	Slope	1.00	Depth to saturated zone	1.00	Slope	0.96
	Restricted permeability	0.99	Slope	1.00		
	Depth to saturated zone	0.95	Restricted permeability	0.99		
SbD2:						
St. Clair	Very limited		Very limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Restricted permeability	0.91
	Restricted permeability	0.91	Depth to saturated zone	1.00		
	Depth to saturated zone	0.68	Restricted permeability	0.91		
SbE2:						
St. Clair	Very limited		Very limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Restricted permeability	0.91
	Restricted permeability	0.91	Depth to saturated zone	1.00		
	Depth to saturated zone	0.68	Restricted permeability	0.91		
ScC3:						
St. Clair	Very limited		Very limited		Very limited	

Table 27.--Water Management Part 2--Continued

Map symbol and soil name	Constructing grassed waterways: Rating class and limiting features	Value	Constructing terraces and diversions: Rating class and limiting features	Value	Drainage: Rating class and limiting features	Value
	Slope	1.00	Depth to saturated zone	1.00	Restricted permeability	0.99
	Restricted permeability	0.99	Slope	1.00	Slope	0.96
	Depth to saturated zone	0.95	Restricted permeability	0.99		
ScD3:						
St. Clair-----------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.99	Depth to saturated zone	1.00	Restricted permeability	0.99
	Depth to saturated zone	0.95	Restricted permeability	0.99		
ScE3:						
St. Clair-----------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.99	Depth to saturated zone	1.00	Restricted permeability	0.99
	Depth to saturated zone	0.95	Restricted permeability	0.99		
ScF3:						
St. Clair-----------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.99	Depth to saturated zone	1.00	Restricted permeability	0.99
	Depth to saturated zone	0.95	Restricted permeability	0.99		
SdB:						
Seward--------------	Very limited		Somewhat limited		Very limited	
	Droughty	1.00	Restricted permeability	0.94	Depth to saturated zone	1.00
	Restricted permeability	0.94			Restricted permeability	0.94
	Depth to saturated zone	0.11			Slope	0.04
SdC:						
Seward--------------	Very limited		Very limited		Very limited	
	Droughty	1.00	Slope	1.00	Depth to saturated zone	1.00
	Slope	1.00	Restricted permeability	0.94	Slope	0.96
	Restricted permeability	0.94			Restricted permeability	0.94
	Depth to saturated zone	0.11				
SdD:						
Seward--------------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Droughty	1.00	Restricted permeability	0.94	Depth to saturated zone	1.00
	Restricted permeability	0.94			Restricted permeability	0.94
	Depth to saturated zone	0.11				

Table 27.--Water Management Part 2--Continued

Map symbol and soil name	Constructing grassed waterways: Rating class and limiting features	Value	Constructing terraces and diversions: Rating class and limiting features	Value	Drainage: Rating class and limiting features	Value
SeB:						
Seward	Very limited		Somewhat limited		Very limited	
	Droughty	1.00	Restricted permeability	0.99	Depth to saturated zone	1.00
	Restricted permeability	0.99			Restricted permeability	0.99
	Depth to saturated zone	0.11			Slope	0.04
SeC:						
Seward	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Depth to saturated zone	1.00
	Droughty	1.00	Restricted permeability	0.99	Restricted permeability	0.99
	Restricted permeability	0.99			Slope	0.96
	Depth to saturated zone	0.11				
SfA:						
Shinrock Variant	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Cutbanks cave	1.00
	Restricted permeability	0.22	Too sandy	1.00	Restricted permeability	0.22
			Restricted permeability	0.22		
Sh:						
Shoals	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
Sm:						
Sloan	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
			Ponding	1.00	Frost action	1.00
					Flooding	1.00
Sn:						
Sloan	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
					Flooding	1.00
So:						
Sloan	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
					Flooding	1.00
SpB:						
Spinks	Very limited		Very limited		Very limited	
	Droughty	1.00	Too sandy	1.00	Cutbanks cave	1.00
					Depth to saturated zone	1.00

Table 27.--Water Management Part 2--Continued

Map symbol and soil name	Constructing grassed waterways: Rating class and limiting features	Value	Constructing terraces and diversions: Rating class and limiting features	Value	Drainage: Rating class and limiting features	Value
					Slope	0.04
SpC:						
Spinks	Very limited		Very limited		Very limited	
	Droughty	1.00	Too sandy	1.00	Cutbanks cave	1.00
	Slope	1.00	Slope	1.00	Depth to saturated zone	1.00
					Slope	0.96
SpD:						
Spinks	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Droughty	1.00	Too sandy	1.00	Cutbanks cave	1.00
					Depth to saturated zone	1.00
TdA:						
Tedrow	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
	Droughty	1.00	Too sandy	1.00		
TeA:						
Tedrow Variant	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
	Droughty	1.00	Too sandy	1.00		
To:						
Toledo	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Restricted permeability	0.91	Ponding	1.00	Restricted permeability	0.91
			Restricted permeability	0.91		
Tt:						
Toledo	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Restricted permeability	0.91	Ponding	1.00	Restricted permeability	0.91
			Restricted permeability	0.91		
TuB2:						
Tuscola	Somewhat limited		Very limited		Very limited	
	Depth to saturated zone	0.47	Too sandy	1.00	Frost action	1.00
			Depth to saturated zone	1.00	Cutbanks cave	1.00
					Slope	0.04
TuC2:						
Tuscola	Very limited		Very limited		Very limited	
	Slope	1.00	Too sandy	1.00	Frost action	1.00
	Depth to saturated zone	0.47	Slope	1.00	Cutbanks cave	1.00

Table 27.--Water Management Part 2--Continued

Map symbol and soil name	Constructing grassed waterways: Rating class and limiting features	Value	Constructing terraces and diversions: Rating class and limiting features	Value	Drainage: Rating class and limiting features	Value
			Depth to saturated zone	1.00	Slope	0.96
Ud:						
Udorthents	Not rated		Not rated		Not rated	
Ur:						
Urban Land	Not rated		Not rated		Not rated	
VaA:						
Vaughnsville	Somewhat limited		Very limited		Very limited	
	Restricted permeability	0.91	Depth to saturated zone	1.00	Frost action	1.00
	Depth to saturated zone	0.47	Restricted permeability	0.91	Restricted permeability	0.91
W:						
Water	Not rated		Not rated		Not rated	
Wa:						
Wabasha	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
	Restricted permeability	0.91	Restricted permeability	0.91	Flooding	1.00
					Restricted permeability	0.91
Wc:						
Warners	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
	Restricted permeability	0.91	Restricted permeability	0.91	Restricted permeability	0.91
Wf:						
Wauseon	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
			Ponding	1.00	Frost action	1.00
Wg:						
Wauseon	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
			Ponding	1.00	Frost action	1.00

TABLE 28.--ENGINEERING INDEX PROPERTIES

(Absence of an entry indicates that the data were not estimated. See text on page 204 for additional information.)

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Ad:												
Adrian----------	0-22	Muck	PT		0	0	0	0	0	0	---	NP
	22-50	Loamy fine sand, loamy sand, fine sand	SM, SP-SM	A-2, A-3	0	0	100	100	90-100	5-35	---	NP
ArB:												
Arkport---------	0-24	Fine sand	SM, SP-SM	A-2	0	0	100	95-100	90-100	5-35	0-14	NP
	24-58	Loamy fine sand, fine sand, fine sandy loam	SM	A-2, A-4	0	0	100	90-100	85-100	30-45	0-15	NP-4
	58-75	Fine sand, loamy fine sand, loamy sand	SM, SP-SM	A-2, A-3	0	0	100	90-100	90-100	5-35	0-14	NP
ArC:												
Arkport---------	0-6	Fine sand	SM, SP-SM	A-2	0	0	100	95-100	90-100	5-35	0-14	NP
	6-55	Loamy fine sand, fine sand, fine sandy loam	SM	A-2, A-4	0	0	100	90-100	85-100	30-45	0-15	NP-4
	55-79	Fine sand, loamy fine sand, loamy sand	SM, SP-SM	A-2, A-3	0	0	100	90-100	90-100	5-35	0-14	NP
AsA:												
Aurand----------	0-10	Fine sandy loam	SM, SC, SC-SM	A-2, A-4	0	0	95-100	85-100	65-100	30-50	15-30	NP-10
	10-30	Clay loam, loam, sandy clay loam	CL, SC	A-2, A-6, A-7	0	0	90-100	70-100	65-95	30-85	30-45	10-25
	30-38	Silty clay loam, loam, sandy loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-5, A-7, A-6	0	0-1	90-100	70-100	60-95	30-85	20-45	5-20
	38-59	Clay, silty clay loam, clay loam	CL	A-6, A-7	0	0-5	95-100	90-100	85-100	65-95	35-50	15-25
	59-80	Clay, silty clay loam, clay loam	CL	A-6, A-7	0	0-5	95-100	90-100	85-100	65-95	35-50	15-25
AtA:												
Aurand----------	0-11	Loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	95-100	85-100	65-100	45-75	20-40	5-20
	11-29	Clay loam, loam, sandy clay loam	CL, SC	A-2, A-6, A-7	0	0	90-100	70-100	65-95	30-85	30-45	10-25
	29-33	Silty clay loam, loam, sandy loam	SC-SM, CL, SC, CL-ML	A-7, A-5, A-2, A-4, A-6	0	0-1	90-100	70-100	60-95	30-85	20-45	5-20
	33-48	Clay, silty clay loam, clay loam	CL	A-6, A-7	0	0-5	95-100	90-100	85-100	65-95	35-50	15-25
	48-80	Clay, silty clay loam, clay loam	CL	A-6, A-7	0	0-5	95-100	90-100	85-100	65-95	35-50	15-25
BcA:												
Bixler----------	0-10	Loamy fine sand	SM	A-2, A-4	0	0	100	95-100	60-85	20-45	---	NP
	10-22	Loamy fine sand, fine sand	SM	A-2, A-4	0	0	100	95-100	60-85	20-45	---	NP
	22-25	Sandy loam, loam, fine sandy loam	ML, SC, SC-SM, SM	A-4, A-2	0	0	100	95-100	60-90	30-70	10-25	NP-10
	25-60	Stratified fine sand to silty clay loam	CL, ML, SC, SM	A-4, A-6	0	0	100	95-100	70-100	35-90	10-35	3-20

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
Ca: Clay Pits	---	---	---	---	---	---	---	---	---	---	---	---
Ch: Cohoctah	0-44	Fine sandy loam	SM	A-2, A-4	0	0	100	100	80-100	20-40	0-30	NP-10
	44-62	Loamy sand, fine sandy loam	SM	A-2, A-1	0	0	100	100	80-100	20-35	0-30	NP-10
	62-71	Sand, loamy fine sand	SM, SP-SM	A-2, A-3, A-1	0	0	100	100	80-100	5-15	0-30	NP-10
Ck: Colwood	0-8	Fine sandy loam	SC, SM, SC-SM	A-4	0	0	100	100	85-100	35-50	15-30	NP-10
	8-38	Sandy clay loam, silty clay loam, fine sandy loam	CL-ML, SC, SC-SM, CL	A-4, A-6	0	0	100	100	80-100	40-90	25-45	5-20
	38-60	Stratified fine sand to very fine sand to silt	SC-SM, CL-ML, CL, ML, SC, SM	A-2, A-4	0	0	100	100	70-100	30-80	10-25	NP-10
Cm: Colwood	0-8	Loam	CL, CL-ML	A-4, A-6	0	0	100	100	85-100	50-70	20-35	5-15
	8-38	Sandy clay loam, silty clay loam, fine sandy loam	CL-ML, SC, SC-SM, CL	A-4, A-6	0	0	100	100	80-100	40-90	25-45	5-20
	38-60	Stratified fine sand to very fine sand to silt	SC-SM, CL-ML, CL, ML, SC, SM	A-2, A-4	0	0	100	100	70-100	30-80	10-25	NP-10
Cn: Colwood	0-11	Loam	CL-ML, ML	A-4	0	0	100	95-100	90-100	65-95	15-35	2-12
	11-48	Loam, fine sandy loam, silty clay loam	ML, CL-ML	A-4, A-6	0	0	100	100	90-100	65-95	25-45	8-20
	48-65	Stratified very fine sand to silt loam	CL-ML, ML	A-4	0	0	100	100	85-100	80-100	15-25	NP-10
Co: Colwood	0-11	Silt loam	CL, CL-ML, ML	A-4	0	0	100	95-100	90-100	65-95	15-35	2-12
	11-48	Loam, fine sandy loam, silty clay loam	ML, CL-ML	A-4, A-6	0	0	100	100	90-100	60-95	25-45	8-20
	48-65	Stratified very fine sand to silt loam	CL-ML, ML	A-4	0	0	100	100	85-100	80-100	0-25	NP-10
Cu: Cut And Fill Land	---	---	---	---	---	---	---	---	---	---	---	---
DeA: Del Rey	0-9	Loam	ML, CL-ML	A-4	0	0	100	95-100	85-100	65-90	25-45	10-25
	9-34	Silty clay loam, silty clay	CL-ML, CL	A-7, A-6	0	0	100	90-100	80-95	80-95	40-55	20-30
	34-52	Stratified silt loam to clay loam to silty clay loam	CL, CL-ML	A-6, A-7	0	0	100	95-100	85-100	65-95	30-45	10-25
DfA: Del Rey	0-9	Silt loam	ML, CL-ML	A-4	0	0	100	95-100	85-100	65-90	25-45	10-25
	9-34	Silty clay loam, silty clay	CL-ML, CL	A-7, A-6	0	0	100	90-100	80-95	80-95	40-55	20-30
	34-52	Stratified silt loam to clay loam to silty clay loam	CL, CL-ML	A-6, A-7	0	0	100	95-100	85-100	65-95	30-45	10-25

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
DuA:												
Digby	0-9	Fine sandy loam	SM	A-2, A-4	0	0	85-100	80-100	75-90	30-50	0-30	NP-4
	9-37	Clay loam, sandy clay loam, loam	SC, CL	A-2, A-4, A-6	0	0	85-100	80-100	75-90	30-55	25-40	4-15
	37-50	Stratified gravelly sand to gravelly sandy loam	SM, SP-SM	A-1, A-3	0	0-5	65-85	45-75	20-50	5-35	0-20	NP-4
DyA:												
Digby	0-9	Loam	CL-ML, ML	A-4	0	0	85-100	80-100	75-90	30-50	0-36	NP-10
	9-37	Clay loam, sandy clay loam, loam	CL, SC	A-2, A-4, A-6	0	0	85-100	80-100	75-90	30-55	25-40	4-15
	37-50	Stratified gravelly sand to gravelly sandy loam	SM, SP-SM	A-1, A-3	0	0-5	65-85	45-75	20-50	5-35	0-20	NP-4
DzA:												
Digby	0-9	Loam	CL-ML, ML, SM	A-4	0	0	85-100	80-100	70-90	40-80	20-36	NP-10
	9-20	Clay loam, sandy clay loam, loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0	85-100	80-100	65-80	30-60	25-40	4-15
	20-35	Gravelly sandy clay loam, gravelly clay loam, gravelly loam	CL, CL-ML, SC, SC-SM	A-1, A-2, A-4, A-6	0	0-5	85-100	50-80	40-75	20-60	25-40	4-15
	35-60	Stratified gravelly sand to very gravelly sandy loam	SM, SP-SM, SW-SM	A-1, A-2	0	0-5	80-100	50-80	30-60	10-30	15-20	NP-4
Ee:												
Eel	0-8	Loam	CL, CL-ML	A-4, A-6	0	0	100	90-100	90-100	60-75	20-40	5-15
	8-38	Loam, clay loam, silt loam	CL, CL-ML	A-4, A-6	0	0	100	90-100	90-100	55-85	25-45	5-15
	38-60	Loam, fine sandy loam, sandy loam	CL, CL-ML, SC, SC-SM	A-4, A-6, A-2	0	0	100	75-100	60-90	30-70	20-40	5-15
FsA:												
Fulton	0-9	Loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	80-95	24-40	3-16
	9-32	Silty clay, clay	CH, CL	A-7	0	0	100	100	90-100	90-100	40-60	18-34
	32-60	Stratified sand to silt loam to silty clay	CH, CL, CL-ML	A-7, A-6	0	0	100	100	90-100	80-100	40-60	18-34
FsB:												
Fulton	0-9	Loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	80-95	24-40	3-16
	9-32	Silty clay, clay	CH, CL	A-7	0	0	100	100	90-100	90-100	40-60	18-34
	32-60	Stratified fine sand to silt loam to silty clay	CH, CL, CL-ML	A-7, A-6	0	0	100	100	90-100	80-100	40-60	18-34
FuA:												
Fulton	0-9	Silty clay loam	CL, CL-ML	A-6, A-7	0	0	100	100	90-100	80-95	35-50	12-24
	9-32	Silty clay, clay	CH, CL	A-7	0	0	100	100	90-100	90-100	40-60	18-34
	32-60	Stratified fine sand to silt loam to silty clay	CH, CL, CL-ML	A-7, A-6	0	0	100	100	90-100	80-100	40-60	18-34
FuB:												
Fulton	0-9	Silty clay loam	CL, CL-ML	A-6, A-7	0	0	95-100	95-100	85-100	80-95	35-50	12-24
	9-32	Silty clay, clay	CH, CL	A-7	0	0	100	100	90-100	90-100	40-60	18-34
	32-60	Stratified fine sand to silt loam to silty clay	CH, CL, CL-ML	A-7, A-6	0	0	100	100	90-100	80-100	40-60	18-34

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
FvA: Fulton Variant--	0-9	Loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	80-95	20-30	3-10
	9-33	Clay, clay loam	CH, CL	A-7	0	0	100	100	90-100	90-100	40-60	15-30
	33-57	Stratified sandy loam, silt loam, coarse sand	ML, SP-SM, SM, CL-ML	A-2, A-4, A-1, A-6	0	0	90-100	45-95	40-70	5-65	20-30	2-8
	57-64	Stratified silty clay to silty clay loam to coarse sand	CL, CH	A-6, A-7	0	0	95-100	90-100	85-100	80-95	40-60	15-35
GaA: Galen-----------	0-28	Fine sand	SM	A-2	0	0	100	90-100	90-100	10-25	0-15	NP
	28-79	Loamy fine sand, fine sandy loam	SM	A-2, A-4	0	0	95-100	90-100	85-95	30-50	0-15	NP-4
	79-92	Stratified fine sand to loamy sand to loamy fine sand	SM, SP-SM	A-2, A-3	0	0	95-100	90-100	90-100	5-20	0-14	NP
GaB: Galen-----------	0-28	Fine sand	SM	A-2	0	0	100	90-100	90-100	10-25	0-15	NP
	28-79	Loamy fine sand, fine sandy loam	SM	A-2, A-4	0	0	95-100	90-100	85-95	30-50	0-15	NP-4
	79-92	Stratified fine sand to loamy sand to loamy fine sand	SM, SP-SM	A-2, A-3	0	0	95-100	90-100	90-100	5-20	0-14	NP
GbB: Galen-----------	0-10	Loamy fine sand	SM	A-2, A-4	0	0	100	95-100	65-85	25-40	---	NP
	10-28	Fine sandy loam, very fine sandy loam, fine sand	ML, SM	A-2, A-4	0	0	100	95-100	70-95	25-65	0-15	NP-4
	28-58	Loamy fine sand, loamy very fine sand, fine sand	ML, SM	A-2, A-4	0	0	100	95-100	70-95	25-60	0-15	NP-4
	58-68	Stratified fine sand to very fine sand	SM	A-2, A-4	0	0	100	95-100	60-90	20-50	---	NP
Gm: Genesee---------	0-20	Loam	CL-ML, ML	A-4	0	0	95-100	90-100	80-95	60-75	26-40	3-15
	20-52	Stratified sandy loam to loam to silt loam	CL-ML, ML	A-4	0	0	95-100	90-100	80-95	65-95	20-35	3-15
Go: Gilford---------	0-32	Fine sandy loam	SM	A-2-4, A-4	0	0	100	95-100	65-90	25-50	0-25	2-10
	32-60	Fine sand, loamy fine sand	SM, SP-SM	A-2, A-3	0	0	100	95-100	85-100	5-35	0-14	NP
Gr: Granby----------	0-20	Loamy fine sand	SM	A-2, A-4	0	0	100	90-100	75-95	20-50	0-14	NP
	20-63	Sand, fine sand	SM, SP-SM	A-2, A-3	0	0	100	90-100	85-100	5-35	0-14	NP
Gv: Gravel Pits-----	---	---	---	---	---	---	---	---	---	---	---	---
HaA: Haney-----------	0-12	Fine sandy loam	CL-ML, ML, SM	A-4, A-2	0	0	100	90-100	75-90	30-55	15-25	NP-7
	12-28	Fine sandy loam, loam	CL, ML, SC, SM	A-4, A-2	0	0	95-100	90-100	80-100	25-50	25-40	3-16
	28-42	Clay loam, sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0-5	90-100	85-100	75-95	40-75	25-40	4-15
	42-80	Stratified fine sand to gravelly loamy sand to sandy clay loam	SM	A-2	0	0-5	100	75-100	75-100	20-35	15-30	NP-4

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
HaB:												
Haney-----------	0-12	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-2, A-4	0	0	100	90-100	75-90	30-55	15-25	NP-7
	12-28	Fine sandy loam, loam	CL, ML, SC, SM	A-4, A-2	0	0	95-100	90-100	80-100	25-50	25-40	3-16
	28-42	Clay loam, sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0-5	90-100	85-100	75-95	40-75	25-40	4-15
	42-80	Stratified fine sand to gravelly loamy sand to sandy clay loam	SM	A-2	0	0-5	100	75-100	75-100	20-35	15-30	NP-4
HdA:												
Haney-----------	0-12	Loam	ML	A-4	0	0	100	90-100	75-90	50-80	20-36	NP-10
	12-28	Fine sandy loam, loam	CL, ML, SC, SM	A-4, A-2	0	0	95-100	90-100	80-100	25-50	25-40	3-16
	28-42	Clay loam, sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0-5	90-100	85-100	75-95	40-75	25-40	4-15
	42-80	Stratified fine sand to gravelly loamy sand to sandy clay loam	SM	A-2	0	0-5	100	75-100	75-100	20-35	15-30	NP-4
HdB:												
Haney-----------	0-12	Loam	ML	A-4	0	0	100	90-100	75-90	50-80	20-36	NP-10
	12-28	Fine sandy loam, loam	CL, ML, SC, SM	A-4, A-2	0	0	95-100	90-100	80-100	25-50	25-40	3-16
	28-42	Clay loam, sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0-5	90-100	85-100	75-95	40-75	25-40	4-15
	42-80	Stratified fine sand to gravelly loamy sand to sandy clay loam	SM	A-2	0	0-5	100	75-100	75-100	20-35	15-30	NP-4
HeC:												
Haney-----------	0-12	Loam	ML	A-4	0	0	100	90-100	75-90	50-80	20-36	NP-10
	12-28	Fine sandy loam, loam	CL, ML, SC, SM	A-4, A-2	0	0	95-100	90-100	80-100	25-50	25-40	3-16
	28-42	Clay loam, sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0-5	90-100	85-100	75-95	40-75	25-40	4-15
	42-80	Stratified fine sand to gravelly loamy sand to sandy clay loam	SM	A-2	0	0-5	100	75-100	75-100	20-35	15-30	NP-4
Rawson----------	0-12	Loam	SM, ML	A-4	0	0	95-100	90-100	70-90	40-60	25-40	4-16
	12-26	Clay loam, sandy clay loam	CL, SC	A-2-4, A-4	0	0	90-100	90-100	60-85	30-55	20-40	7-20
	26-60	Clay, silty clay, clay loam	CH, CL-ML	A-6, A-7	0	0	100	90-100	90-100	85-95	35-65	15-40
HkA:												
Haskins---------	0-7	Fine sandy loam	ML, SM	A-2, A-4	0	0	95-100	90-100	85-95	25-55	15-30	NP-5
	7-24	Clay loam, sandy clay loam, loam	CL, SC	A-4, A-6	0	0	95-100	90-100	50-85	40-75	20-40	7-20
	24-60	Clay, silty clay, clay loam	CH, CL-ML	A-6, A-7	0	0	100	95-100	90-100	80-95	35-65	15-40
HlA:												
Haskins---------	0-7	Loam	ML, CL-ML	A-4, A-6	0	0	95-100	90-100	85-95	60-75	25-40	5-20
	7-24	Clay loam, sandy clay loam, loam	CL, SC	A-4, A-6	0	0	95-100	90-100	50-85	40-75	20-40	7-20
	24-60	Clay, silty clay, clay loam	CH, CL-ML	A-6, A-7	0	0	100	95-100	90-100	80-95	35-65	15-40
HlB:												
Haskins---------	0-16	Loam	CL, CL-ML	A-4, A-6	0	0	90-100	80-100	75-100	50-75	25-40	5-20
	16-30	Clay loam, sandy clay loam, loam	CL	A-4, A-6	0	0	85-100	80-100	75-100	50-70	20-40	7-20
	30-60	Clay, silty clay, clay loam	CH, CL	A-6, A-7	0	0	90-100	85-100	80-100	70-85	35-65	15-40

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
HnA:												
Haskins---------	0-7	Fine sandy loam	ML, CL-ML	A-4, A-2	0	0	95-100	90-100	85-95	25-55	15-30	NP-5
	7-24	Clay loam, sandy clay loam, loam	CL, SC	A-4, A-6	0	0	95-100	90-100	50-85	40-75	20-40	7-20
	24-40	Clay, silty clay, clay loam	CH, CL-ML	A-6, A-7	0	0	100	95-100	90-100	80-95	35-65	15-40
	40-49	Sandy clay loam	SC, CL	A-6, A-2	0	0	100	90-100	50-80	35-55	20-40	5-20
	49-55	Clay	CH, CL-ML	A-7, A-6	0	0	100	95-100	90-100	80-95	40-65	20-40
	55-62	Sandy loam	SM	A-4, A-2	0	0	100	100	65-90	30-40	15-40	NP-10
	62-64	Clay	CH, CL-ML	A-7, A-6	0	0	100	95-100	90-100	80-95	40-65	20-40
Ho:												
Hoytville-------	0-7	Clay loam	CL	A-7	0	0-5	100	90-100	90-100	85-100	40-50	22-30
	7-37	Clay	CH, MH	A-7	0	0-5	100	90-100	90-100	85-100	42-66	22-40
	37-60	Clay, clay loam	CH, CL, MH	A-7	0	0-5	95-100	90-100	90-100	85-95	40-62	22-40
Hp:												
Hoytville-------	0-9	Silty clay loam	CL	A-7, A-6	0	0-5	95-100	90-100	85-100	75-95	30-50	10-30
	9-43	Silty clay, clay	CH, CL	A-7	0	0-5	95-100	85-100	80-100	75-95	45-60	25-35
	43-58	Clay loam, silty clay loam, clay	CL, CH	A-6, A-7	0	0-5	95-100	85-100	80-100	60-95	40-60	20-35
	58-80	Silty clay loam, clay loam, clay	CL	A-6, A-7	0	0-5	95-100	85-100	80-100	50-95	30-50	10-30
Hr:												
Hoytville-------	0-9	Clay loam	CL	A-7, A-6	0	0-5	95-100	90-100	85-100	75-95	35-50	15-25
	9-52	Silty clay, clay	CH, CL	A-7	0	0-5	95-100	85-100	80-100	70-95	45-60	25-35
	52-60	Clay loam, silty clay loam, clay	CL, CH	A-7, A-6	0	0-5	95-100	85-100	80-100	70-95	40-60	20-35
	60-80	Clay loam, clay, silty clay loam	CL	A-6, A-7	0	0-5	95-100	85-100	80-100	65-95	35-50	15-25
Hs:												
Hoytville-------	0-8	Silty clay	CH, CL	A-7	0	0-5	95-100	90-100	85-100	80-95	45-60	25-35
	8-41	Silty clay, clay	CH, CL	A-7	0	0-5	95-100	85-100	80-100	70-95	45-60	25-35
	41-60	Clay loam, silty clay loam, clay	CH, CL	A-6, A-7	0	0-5	95-100	85-100	80-100	70-95	40-60	20-35
	60-80	Clay loam, clay, silty clay loam	CL	A-6, A-7	0	0-5	95-100	85-100	80-100	65-95	35-50	15-30
Hv:												
Hoytville-------	0-7	Clay	CH, CL-ML, MH	A-7	0	0-5	100	90-100	90-100	80-100	45-66	22-40
	7-37	Clay	CH, CL-ML, MH	A-7	0	0-5	100	90-100	90-100	85-100	42-66	22-40
	37-60	Clay, clay loam	CH, CL, MH	A-7	0	0-5	95-100	90-100	90-100	85-95	40-62	22-40
Hw:												
Hoytville Variant--------	0-13	Clay	CH, CL-ML	A-7	0	0-5	100	90-100	80-100	70-100	45-65	20-40
	13-44	Clay, clay loam	CH, MH	A-7	0	0-5	100	90-100	80-100	75-100	35-60	22-40
KeA:												
Kibbie----------	0-16	Loamy fine sand	SC-SM, SM, SC	A-2, A-4	0	0	100	95-100	70-95	30-45	0-25	NP-10
	16-36	Loam, silty clay loam, fine sandy loam	CL, SC	A-6, A-7	0	0	100	95-100	70-95	35-90	25-45	10-20
	36-60	Stratified fine sand to silt loam	SC, SM, CL, ML, SC-SM, CL-ML	A-2, A-4	0	0	100	95-100	70-95	30-80	15-30	NP-10
KfA:												
Kibbie----------	0-15	Fine sandy loam	ML	A-4	0	0	100	100	70-90	55-85	0-30	NP-11
	15-38	Loam, fine sandy loam, sandy clay loam	CL, ML	A-4	0	0	100	100	70-90	55-85	25-45	9-25
	38-72	Stratified silt to silt loam to fine sand	CL-ML, ML	A-4	0	0	100	100	80-100	65-90	15-30	NP-10

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
KlA:												
Kibbie----------	0-12	Loam	ML	A-4	0	0	100	100	70-90	55-85	15-35	NP-15
	12-38	Loam, fine sandy loam, sandy clay loam	CL-ML	A-4	0	0	100	100	70-90	55-85	25-45	9-25
	38-71	Stratified silt to silt loam to fine sand	CL-ML, ML	A-4	0	0	100	100	80-100	65-90	15-30	NP-10
La:												
Latty-----------	0-8	Clay	CH, CL-ML, MH	A-7	0	0	100	100	95-100	90-100	40-65	15-40
	8-41	Clay	CL-ML, CH, ML	A-7	0	0	100	100	95-100	85-100	40-65	15-40
	41-71	Clay, clay loam	CL-ML, CH, ML	A-7	0	0-2	95-100	90-100	90-100	85-95	40-65	15-40
Lb:												
Latty-----------	0-9	Silty clay	CH, MH	A-7	0	0	100	100	90-100	85-100	50-75	20-40
	9-44	Clay, silty clay	CH	A-7	0	0	100	100	90-100	85-100	50-70	25-45
	44-60	Clay, silty clay	CH	A-7	0	0	100	100	90-100	85-100	50-70	25-45
Le:												
Lenawee---------	0-8	Loam	CL-ML, ML	A-6, A-7	0	0	100	100	90-100	90-100	35-45	15-25
	8-43	Silty clay loam, silty clay, clay loam	CL-ML, CL	A-6, A-7	0	0	100	100	90-100	90-100	40-55	20-30
	43-61	Stratified silt to silt loam to silty clay	CL-ML, CH	A-6, A-7	0	0	100	100	90-100	90-100	25-50	10-25
Lf:												
Lenawee---------	0-8	Silty clay loam	CL-ML, ML	A-6, A-7	0	0	100	100	90-100	90-100	35-45	15-25
	8-43	Silty clay loam, silty clay, clay loam	CL-ML, CL	A-6, A-7	0	0	100	100	90-100	90-100	40-55	20-30
	43-61	Stratified silt to silt loam to silty clay	CH, CL-ML	A-6, A-7	0	0	100	100	90-100	90-100	25-50	10-25
LwB2:												
Lucas-----------	0-5	Silty clay loam	CL-ML, CL	A-6, A-7	0	0	100	100	90-100	85-100	30-45	13-25
	5-25	Silty clay, clay	CH, CL-ML	A-6, A-7	0	0	100	100	90-100	90-100	45-65	18-34
	25-60	Silty clay, clay, silty clay loam	CH, CL-ML	A-6, A-7	0	0	100	100	90-100	90-100	40-65	18-34
LwC2:												
Lucas-----------	0-5	Silty clay loam	CL-ML, CL	A-6, A-7	0	0	100	100	90-100	85-100	30-45	13-25
	5-25	Silty clay, clay	CH, CL-ML	A-6, A-7	0	0	100	100	90-100	90-100	45-65	18-34
	25-60	Silty clay, clay, silty clay loam	CH, CL-ML	A-6, A-7	0	0	100	100	90-100	90-100	40-65	18-34
LxC3:												
Lucas-----------	0-5	Silty clay	CL-ML, CL	A-6, A-7	0	0	100	100	90-100	85-100	40-55	20-31
	5-25	Silty clay, clay	CH, CL-ML	A-6, A-7	0	0	100	100	90-100	90-100	45-65	18-34
	25-60	Silty clay, clay, silty clay loam	CH, CL-ML	A-6, A-7	0	0	100	100	90-100	90-100	40-65	18-34
LxE3:												
Lucas-----------	0-5	Silty clay	CL-ML, CL	A-6, A-7	0	0	100	100	90-100	85-100	40-55	20-31
	5-25	Silty clay, clay	CH, CL-ML	A-6, A-7	0	0	100	100	90-100	90-100	45-65	18-34
	25-60	Silty clay, clay, silty clay loam	CL-ML, CH	A-6, A-7	0	0	100	100	90-100	90-100	40-65	18-34
Mb:												
Mermill---------	0-9	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	85-100	75-100	50-70	20-40	5-20
	9-35	Clay loam, sandy clay loam, loam	SC-SM, CL, SC, CL-ML	A-4, A-6, A-7, A-5	0	0	90-100	85-100	70-85	40-75	25-45	5-25
	35-46	Clay, silty clay, clay loam	CL	A-6, A-7	0	0-2	95-100	85-100	75-100	65-95	35-50	15-25
	46-80	Clay, silty clay, clay loam	CL	A-6, A-7	0	0-2	95-100	85-100	75-100	65-95	35-50	15-25

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
Aurand----------	0-11	Loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	95-100	85-100	65-100	45-75	20-40	5-20
	11-23	Clay loam, loam, sandy clay loam	CL, SC	A-2, A-6, A-7	0	0	90-100	70-100	65-95	30-85	30-45	10-25
	23-29	Clay loam, silty clay loam, sandy loam	CL, SC, SC-SM, CL-ML	A-2, A-4, A-6, A-7, A-5	0	0-1	90-100	70-100	60-95	30-85	20-45	5-20
	29-51	Clay loam, silty clay loam, clay	CL	A-6, A-7	0	0-5	95-100	90-100	85-100	65-95	35-50	15-25
	51-80	Silty clay loam, clay loam, clay	CL	A-6, A-7	0	0-5	95-100	90-100	85-100	65-95	35-50	15-25
Mc: Mermill---------	0-9	Silty clay loam	CL	A-6, A-7	0	0	95-100	90-100	85-100	75-95	30-45	10-22
	9-20	Clay loam, sandy clay loam, loam	CL	A-4, A-6, A-7	0	0	95-100	90-100	80-100	55-80	24-44	8-22
	20-34	Clay loam, sandy clay loam, loam	CL, SC	A-7, A-6, A-4	0	0	95-100	90-100	80-100	40-60	24-44	8-22
	34-60	Clay, silty clay loam, clay loam	CH, CL	A-6, A-7	0	0-2	95-100	90-100	85-100	80-95	38-65	18-40
Md: Medway----------	0-18	Silt loam	CL-ML, ML	A-4	0	0	95-100	90-100	80-90	75-85	20-40	3-15
	18-60	Loam, silty clay loam, clay loam	CL, CL-ML	A-6	0	0	95-100	90-100	80-90	70-90	20-45	4-20
Me: Mermill---------	0-9	Loam	ML	A-4	0	0	100	90-100	80-100	55-85	20-32	2-10
	9-40	Clay loam, sandy clay loam, loam	CL, SC	A-4, A-6	0	0	100	90-100	80-100	40-60	24-44	8-22
	40-60	Clay, silty clay, clay loam	CH, CL-ML	A-6, A-7	0	0-2	100	90-100	90-100	80-95	38-65	18-40
Mf: Mermill---------	0-9	Clay loam	ML	A-4	0	0	100	90-100	80-100	65-80	30-45	10-20
	9-40	Clay loam, sandy clay loam, loam	CL, SC	A-4, A-6	0	0	100	90-100	80-100	40-60	24-44	8-22
	40-60	Clay, silty clay, clay loam	CH, CL-ML	A-6, A-7	0	0-2	100	90-100	80-100	80-95	38-65	18-40
Mg: Mermill---------	0-9	Loam	ML	A-4	0	0	100	90-100	80-100	55-85	20-32	2-10
	9-40	Clay loam, sandy clay loam, loam	CL, SC	A-4, A-6	0	0	100	90-100	80-100	40-60	24-44	8-22
	40-66	Stratified silty clay to clay to sand to clay loam	CH, CL	A-6, A-7	0	0-2	100	90-100	90-100	80-95	38-65	18-40
Mh: Millgrove-------	0-12	Loam	SM, ML	A-4	0	0	95-100	90-100	70-90	40-75	20-40	3-16
	12-42	Clay loam, sandy clay loam, loam	CL, SC	A-6	0	0	95-100	90-100	70-85	40-75	25-40	11-26
	42-72	Stratified fine sand to gravelly loamy sand to loamy fine sand	SP-SM, SM	A-2, A-3	0	0-5	85-100	80-100	70-85	5-15	15-35	NP-10
Mk: Millgrove-------	0-12	Clay loam	SM, ML	A-4	0	0	95-100	90-100	70-90	40-75	25-45	7-16
	12-42	Clay loam, sandy clay loam, loam	CL, SC	A-6	0	0	95-100	90-100	70-85	40-75	25-40	11-26
	42-72	Stratified gravelly loamy sand to loamy fine sand	SP-SM, SM	A-3, A-2	0	0-5	85-100	80-100	70-85	5-15	15-35	NP-10

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
NaA:												
Nappanee--------	0-12	Loam	CL, CL-ML	A-6, A-4	0	0-5	100	100	90-100	80-90	30-40	10-15
	12-24	Silty clay, clay, clay loam	CH, CL-ML	A-7	0	0-5	95-100	90-100	90-100	80-95	50-70	25-45
	24-60	Clay, clay loam	CL	A-6	0	0-5	95-100	90-100	90-100	75-90	40-60	20-35
NaB:												
Nappanee--------	0-12	Loam	CL, CL-ML	A-6, A-4	0	0-5	100	100	90-100	80-90	30-40	10-15
	12-24	Silty clay, clay	CL-ML, CH	A-7	0	0-5	95-100	90-100	90-100	80-95	50-70	25-45
	24-60	Clay, clay loam	CL	A-6	0	0-5	95-100	90-100	90-100	75-90	40-60	20-35
NtA:												
Nappanee--------	0-12	Silty clay loam	CL, CL-ML	A-6	0	0-5	100	100	90-100	80-95	40-50	20-25
	12-24	Silty clay, clay	CH, CL-ML	A-7	0	0-5	95-100	90-100	90-100	80-95	50-70	25-45
	24-60	Clay, clay loam	CL	A-6	0	0-5	95-100	90-100	90-100	75-90	40-60	20-35
NtB:												
Nappanee--------	0-12	Silty clay loam	CL, CL-ML	A-6	0	0-5	100	100	90-100	80-95	40-50	20-25
	12-24	Silty clay, clay	CH, CL-ML	A-7	0	0-5	95-100	90-100	90-100	80-95	50-70	25-45
	24-60	Clay, clay loam	CL	A-6	0	0-5	95-100	90-100	90-100	75-90	40-60	20-35
NtB2:												
Nappanee--------	0-12	Silty clay loam	CL, CL-ML	A-6	0	0-5	100	100	90-100	80-95	40-50	20-25
	12-24	Silty clay, clay	CH, CL-ML	A-7	0	0-5	95-100	90-100	90-100	80-95	50-70	25-45
	24-60	Clay, clay loam	CL	A-6	0	0-5	95-100	90-100	90-100	75-90	40-60	20-35
OaC:												
Oakville--------	0-9	Fine sand	SM, SP-SM	A-2, A-3	0	0	100	100	70-85	5-30	---	NP
	9-100	Fine sand, loamy sand	SM, SP-SM	A-2, A-3	0	0	100	100	70-85	5-30	---	NP
ObB:												
Oakville--------	0-6	Fine sand	SM, SP, SP-SM	A-2, A-3	0	0	100	100	50-85	0-35	---	NP
	6-18	Fine sand, loamy fine sand	SM, SP-SM, SP	A-2	0	0	100	95-100	65-95	0-25	---	NP
	18-80	Fine sand	SM, SP-SM, SP	A-2, A-3	0	0	100	95-100	65-95	0-25	---	NP
ObC:												
Oakville--------	0-9	Fine sand	SM, SP, SP-SM	A-2, A-3	0	0	100	100	50-85	0-35	---	NP
	9-39	Fine sand, loamy fine sand	SM, SP, SP-SM	A-2	0	0	100	100	65-95	0-25	---	NP
	39-60	Sand, fine sand	SM, SP, SP-SM	A-2, A-3	0	0	100	95-100	50-80	0-25	---	NP
OsB:												
Oshtemo---------	0-29	Sandy loam	SM	A-2, A-4	0	0	90-100	85-100	60-70	25-45	15-25	2-7
	29-44	Gravelly sandy loam, sandy clay loam	SM	A-2, A-4	0	0	75-90	60-80	50-65	20-45	0-14	NP
	44-70	Stratified gravel to sand to gravelly loam	SM, ML	A-4	0	0-5	75-90	60-80	50-70	40-65	0-14	NP
OtB:												
Ottokee---------	0-47	Fine sand	SM	A-2, A-3	0	0	100	95-100	65-80	12-25	0-14	NP
	47-49	Loamy fine sand, fine sand, loamy sand	SM	A-2, A-4	0	0	100	90-100	55-75	20-40	0-14	NP
	49-81	Fine sand	SM	A-2, A-3	0	0	100	95-100	65-80	12-25	0-14	NP
OuB:												
Ottokee---------	0-8	Fine sand	SM, SP-SM	A-2, A-3	0	0	100	90-100	70-100	5-35	---	NP
	8-60	Loamy fine sand, fine sand, loamy sand	SM, SP-SM	A-2, A-3	0	0	100	90-100	70-100	5-35	---	NP
	60-78	Fine sand, sand	SM, SP-SM, SW-SM	A-2, A-3	0	0	100	95-100	70-100	5-25	---	NP

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
OzB:												
Ottokee	0-11	Loamy fine sand	SM, SC-SM	A-2, A-4	0	0	100	90-100	55-80	15-40	0-20	NP-5
	11-47	Loamy fine sand, fine sand, loamy sand	SP-SM, SM, SC-SM	A-2, A-3	0	0	100	90-100	65-90	5-35	0-20	NP-5
	47-60	Loamy fine sand, fine sand, sand	SC-SM, SM, SP-SM	A-2, A-3	0	0	100	95-100	65-90	5-35	0-20	NP-5
Spinks	0-7	Loamy fine sand	SC-SM, SM, SP-SM	A-2	0	0	95-100	90-100	55-80	10-30	0-20	NP-5
	7-48	Loamy fine sand, sand, fine sand	SC-SM, SM, SP-SM	A-2, A-3	0	0	95-100	90-100	65-90	5-35	0-20	NP-5
	48-60	Fine sand, loamy fine sand, sand	SC-SM, SM, SP-SM	A-2, A-3	0	0	95-100	90-100	65-90	5-35	0-20	NP-5
Pa:												
Paulding	0-8	Clay	CH	A-7	0	0	100	100	90-100	90-100	50-80	20-46
	8-50	Clay	CH	A-7	0	0	100	100	90-100	90-100	60-86	20-46
	50-60	Clay	CH	A-7	0	0	100	100	90-100	90-100	60-86	20-46
Pt:												
Pits, Quarry	---	---	---	---	---	---	---	---	---	---	---	---
RaB:												
Rawson	0-12	Sandy loam	ML, SM	A-4	0	0	90-100	90-100	70-90	40-60	0-30	NP-5
	12-26	Clay loam, sandy clay loam	CL, SC	A-2, A-6	0	0	90-100	90-100	60-85	30-55	20-40	7-20
	26-60	Clay, silty clay, clay loam	CH, CL-ML	A-6, A-7	0	0	100	90-100	90-100	85-95	35-65	15-40
RdB:												
Rawson	0-12	Loam	SM, ML	A-4, A-6	0	0	90-100	90-100	70-90	40-60	25-40	4-16
	12-26	Clay loam, sandy clay loam	CL, SC	A-2, A-6	0	0	90-100	90-100	60-85	30-55	20-40	7-20
	26-60	Clay, silty clay, clay loam	CH, CL-ML	A-6, A-7	0	0	100	90-100	90-100	85-95	35-65	15-40
ReB:												
Rawson	0-10	Fine sandy loam	SM, ML	A-4, A-6	0	0	90-100	90-100	70-90	40-60	25-40	4-16
	10-35	Clay loam, sandy clay loam	CL, SC	A-2, A-6	0	0	90-100	90-100	60-85	30-55	20-40	7-20
	35-60	Stratified sandy loam to clay	CH, CL	A-6, A-7	0	0	90-100	85-100	85-100	75-95	35-65	15-40
RfA:												
Rimer	0-24	Loamy fine sand	SM	A-2, A-4	0	0	95-100	90-100	70-90	20-45	0-14	NP
	24-70	Silty clay, clay	CH, CL-ML	A-6, A-7	0	0	95-100	90-100	85-100	80-95	35-60	15-30
RgA:												
Rimer	0-9	Loamy fine sand	ML, SM	A-1, A-2, A-4	0	0	100	95-100	45-80	15-55	---	NP
	9-23	Loamy fine sand, fine sand, loamy sand	SM	A-2, A-4	0	0	100	95-100	75-90	20-40	---	NP
	23-29	Fine sandy loam, sandy loam	SC, SC-SM, SM	A-4	0	0	100	95-100	60-80	35-50	15-30	NP-10
	29-60	Clay, silty clay, silty clay loam	CH, CL	A-6, A-7	0	0	100	90-100	85-100	75-95	35-65	15-38
RhB:												
Rimer	0-8	Loamy fine sand	SM, SC-SM, SC	A-1, A-2, A-4	0	0	100	95-100	45-80	15-40	0-25	NP-10
	8-25	Loamy fine sand, fine sand, loamy sand	SC, SC-SM, SM	A-2, A-4	0	0	100	95-100	75-90	20-40	0-25	NP-10
	25-27	Sandy loam, fine sandy loam	SC, SM, SC-SM	A-4, A-6	0	0	100	95-100	60-80	35-45	15-30	NP-15
	27-32	Clay loam, silty clay, clay	CL	A-6, A-7	0	0-5	95-100	85-100	80-100	65-95	35-50	15-25
	32-60	Clay loam, clay, silty clay loam	CL	A-6, A-7	0	0-5	95-100	85-100	80-100	65-95	35-50	15-25

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
Tedrow----------	0-14	Loamy fine sand	SM, SC-SM, SC	A-2	0	0	100	95-100	60-80	20-35	0-20	NP-10
	14-34	Fine sand, loamy fine sand, sand	SM, SW-SM, SC-SM, SC	A-2, A-3	0	0	100	95-100	60-80	5-35	0-20	NP-10
	34-60	Clay loam, clay, silty clay loam	CL	A-6, A-7	0	0-5	95-100	85-100	80-100	65-95	35-50	15-25
RmA:												
Rimer-----------	0-29	Loamy fine sand	SM	A-2, A-4	0	0	95-100	90-100	70-90	20-45	0-14	NP
	29-64	Stratified loam to silty clay	CH, CL, MH, ML	A-4, A-6, A-7	0	0	100	90-100	80-100	65-95	25-60	5-30
RoA:												
Roselms---------	0-6	Silty clay loam	CL-ML, CH	A-6, A-7	0	0	95-100	90-100	85-100	80-95	35-45	10-20
	6-25	Clay	CL-ML, CH	A-7	0	0	100	95-100	90-100	75-95	55-80	20-40
	25-60	Clay	CH, CL-ML	A-7	0	0	100	95-100	90-100	80-100	50-80	20-45
RrA:												
Roselms---------	0-8	Silty clay	CH, CL, MH	A-6, A-7	0	0	95-100	95-100	90-100	90-100	35-65	18-32
	8-32	Clay	CH, MH	A-7	0	0	95-100	95-100	90-100	90-100	50-75	24-40
	32-60	Clay	CH	A-7	0	0	95-100	95-100	90-100	90-100	50-75	24-45
Rs:												
Ross------------	0-21	Loam	CL-ML, ML	A-4	0	0	90-100	80-95	80-90	50-75	20-35	NP-12
	21-61	Silt loam	CL-ML, ML	A-4	0	0	90-100	85-100	80-90	65-85	22-45	3-20
SaE3:												
St. Clair-------	0-3	Clay	CH, CL	A-7	0	0-5	95-100	90-100	85-100	70-95	40-55	15-30
	3-22	Clay, silty clay	CH, MH	A-7	0	0-5	95-100	90-100	75-100	65-95	50-70	20-40
	22-60	Clay, silty clay, clay loam	CH	A-7	0	0-5	95-100	90-100	70-100	60-95	50-60	25-35
SbB2:												
St. Clair-------	0-5	Silty clay loam	CL-ML, CL	A-6	0	0-5	100	90-100	90-100	80-90	35-50	15-25
	5-23	Clay	CH, CL-ML	A-6, A-7	0	0-5	100	90-100	85-100	80-95	50-70	20-40
	23-60	Clay, silty clay, clay loam	CL-ML, CH	A-6, A-7	0	0-5	100	90-100	85-100	80-95	50-60	25-35
SbC2:												
St. Clair-------	0-5	Silty clay loam	CL, CL-ML	A-6	0	0-5	100	90-100	90-100	80-90	35-50	15-25
	5-23	Clay	CH, CL-ML	A-7, A-6	0	0-5	100	90-100	85-100	80-95	50-70	20-40
	23-60	Clay, silty clay, clay loam	CH, CL-ML	A-7, A-6	0	0-5	100	90-100	85-100	80-95	50-60	25-35
SbD2:												
St. Clair-------	0-8	Silty clay loam	CL	A-6, A-7	0	0-5	95-100	75-100	70-100	70-95	35-50	15-25
	8-18	Clay, silty clay	CH, CL	A-7	0	0-5	95-100	75-100	75-100	70-95	40-65	20-40
	18-42	Silty clay loam, clay loam, clay	CL	A-7, A-6	0	0-5	95-100	75-100	70-100	65-95	35-50	15-25
	42-60	Silty clay loam, clay loam, clay	CL	A-6, A-7	0	0-5	95-100	75-100	70-100	65-95	35-50	15-25
SbE2:												
St. Clair-------	0-8	Silty clay loam	CL	A-6, A-7	0	0-5	95-100	75-100	70-100	70-95	35-50	15-25
	8-18	Clay, silty clay	CH, CL	A-7	0	0-5	95-100	75-100	75-100	70-95	40-65	20-40
	18-42	Silty clay loam, clay loam, clay	CL	A-7, A-6	0	0-5	95-100	75-100	70-100	65-95	35-50	15-25
	42-60	Silty clay loam, clay loam, clay	CL	A-6, A-7	0	0-5	95-100	75-100	70-100	65-95	35-50	15-25
ScC3:												
St. Clair-------	0-5	Silty clay	CH, CL	A-7	0	0-5	100	90-100	90-100	80-90	45-65	25-35
	5-23	Clay	CH, CL-ML	A-6, A-7	0	0-5	100	90-100	85-100	80-95	45-60	25-35
	23-60	Clay, silty clay, clay loam	CH, CL-ML	A-6, A-7	0	0-5	100	90-100	85-100	80-95	45-60	25-35
ScD3:												
St. Clair-------	0-5	Silty clay	CH, CL	A-7	0	0-5	100	90-100	90-100	80-90	45-65	25-35
	5-23	Clay	CH, CL-ML	A-6, A-7	0	0-5	100	90-100	85-100	80-95	45-60	25-35
	23-60	Clay, silty clay, clay loam	CH, CL-ML	A-6, A-7	0	0-5	100	90-100	85-100	80-95	45-60	25-35

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
ScE3:												
St. Clair-------	0-5	Silty clay	CH, CL	A-7	0	0-5	100	90-100	90-100	80-90	45-65	25-35
	5-23	Clay	CH, CL-ML	A-7, A-6	0	0-5	100	90-100	85-100	80-95	45-60	25-35
	23-60	Clay, silty clay, clay loam	CH, CL-ML	A-7, A-6	0	0-5	100	90-100	85-100	80-95	45-60	25-35
ScF3:												
St. Clair-------	0-5	Silty clay	CL, CH	A-7	0	0-5	100	90-100	90-100	80-90	45-65	25-35
	5-25	Clay	CH, CL-ML	A-6, A-7	0	0-5	100	90-100	85-100	80-95	45-60	25-35
	25-60	Clay, silty clay, clay loam	CH, CL-ML	A-6, A-7	0	0-5	100	90-100	85-100	80-95	45-60	25-35
SdB:												
Seward----------	0-26	Loamy fine sand	SM	A-2, A-4	0	0	100	90-100	50-75	15-40	---	NP
	26-34	Fine sandy loam, sandy loam, sandy clay loam	SM	A-2, A-4	0	0	100	90-100	60-70	30-40	15-40	NP-10
	34-60	Clay, silty clay, clay loam	CH, CL-ML	A-6, A-7	0	0	100	95-100	90-100	80-95	40-65	20-38
SdC:												
Seward----------	0-26	Loamy fine sand	SM	A-2, A-4	0	0	100	90-100	50-75	15-40	---	NP
	26-34	Fine sandy loam, sandy loam, sandy clay loam	SM	A-2, A-4	0	0	100	90-100	60-70	30-40	15-40	NP-10
	34-60	Clay, silty clay, clay loam	CH, CL-ML	A-6, A-7	0	0	100	95-100	90-100	80-95	40-65	20-38
SdD:												
Seward----------	0-26	Loamy fine sand	SM	A-2, A-4	0	0	100	90-100	50-75	15-40	0-14	NP
	26-34	Fine sandy loam, sandy loam, sandy clay loam	SM	A-2, A-4	0	0	100	90-100	60-70	30-40	15-40	NP-10
	34-60	Clay, silty clay, clay loam	CH, CL-ML	A-6, A-7	0	0	100	95-100	90-100	80-95	40-65	20-38
SeB:												
Seward----------	0-27	Loamy fine sand	SM	A-1, A-2, A-4	0	0	100	90-100	50-75	15-40	0-14	NP
	27-94	Stratified sand to clay loam to silty clay	SM	A-4	0	0	100	90-100	60-80	35-50	15-40	NP-10
SeC:												
Seward----------	0-27	Loamy fine sand	SM	A-1, A-2, A-4	0	0	100	90-100	50-75	15-40	0-14	NP
	27-94	Stratified sand to clay loam to silty clay	SM	A-4	0	0	100	90-100	60-80	35-50	15-40	NP-10
SfA:												
Shinrock Variant	0-9	Silt loam	CL-ML, ML	A-4	0	0	100	80-100	75-90	50-75	20-35	2-10
	9-28	Silty clay, silty clay loam	CL-ML, CL	A-6, A-7	0	0	100	90-100	90-100	80-95	35-55	14-32
	28-37	Sandy clay loam	CL, SC	A-2, A-6	0	0	100	90-100	80-90	35-55	15-45	NP-20
	37-82	Sand, coarse sand	SP-SM, SM	A-3, A-1	0	0	100	100	50-70	5-15	---	NP
Sh:												
Shoals----------	0-3	Silt loam	ML, CL-ML	A-4	0	0	95-100	85-100	80-100	65-90	20-35	6-15
	3-31	Silt loam, loam, clay loam	ML, CL-ML	A-4	0	0	95-100	85-100	85-95	55-75	25-40	5-15
	31-60	Stratified sandy loam to loam to silt loam	CL, ML	A-6, A-4	0	0-3	90-100	85-100	70-90	55-90	0-30	3-10
Sm:												
Sloan-----------	0-10	Silty clay loam	CL	A-6, A-7	0	0	100	90-100	90-100	80-95	35-45	15-25
	10-26	Silty clay loam, clay loam, silt loam	CL	A-6, A-7	0	0	100	90-100	85-100	50-95	30-45	10-20
	26-60	Stratified loam to silty clay loam to gravelly sandy loam	SC-SM, CL-ML, CL, SC	A-4, A-6, A-2	0	0	85-100	50-100	45-95	30-90	20-40	5-20

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
Sn:												
Sloan-----------	0-12	Loam, silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	95-100	85-100	70-95	20-40	3-15
	12-36	Silty clay loam, clay loam, loam	CL, ML	A-4, A-6, A-7	0	0	100	90-100	85-100	75-95	30-45	8-18
	36-67	Stratified loam to silty clay loam	CL, ML	A-4, A-6	0	0	95-100	90-100	80-95	65-90	25-40	3-15
So:												
Sloan-----------	0-12	Silty clay loam	CL-ML, ML	A-6, A-7	0	0	100	90-100	90-100	80-95	35-45	12-20
	12-43	Silty clay loam, clay loam, silt loam	CL, CL-ML	A-6, A-7	0	0	100	90-100	90-100	80-95	30-45	8-18
	43-72	Stratified gravelly sandy loam to loam to silt loam	CL-ML, ML	A-4	0	0	100	90-100	90-100	65-85	25-40	3-15
SpB:												
Spinks----------	0-23	Fine sand	SM, SP-SM	A-2, A-3	0	0	100	100	90-100	5-35	0-20	NP-4
	23-100	Fine sand, loamy fine sand, loamy sand	SM, SP-SM	A-3, A-2	0	0	100	100	70-95	5-30	0-25	NP-7
	100-153	Fine sand, sand	SM, SP-SM	A-2, A-3	0	0	100	100	80-100	5-35	0-20	NP-4
SpC:												
Spinks----------	0-23	Fine sand	SM, SP-SM	A-2, A-3	0	0	100	100	90-100	5-35	0-20	NP-4
	23-100	Fine sand, loamy fine sand, loamy sand	SM, SP-SM	A-3, A-2	0	0	100	100	70-95	5-30	0-25	NP-7
	100-153	Fine sand, sand	SM, SP-SM	A-2, A-3	0	0	100	100	80-100	5-35	0-20	NP-4
SpD:												
Spinks----------	0-23	Fine sand	SM, SP-SM	A-2, A-3	0	0	100	100	90-100	5-35	0-20	NP-4
	23-100	Fine sand, loamy fine sand, loamy sand	SM, SP-SM	A-3, A-2	0	0	100	100	70-90	5-30	0-25	NP-7
	100-153	Fine sand, sand	SM, SP-SM	A-2, A-3	0	0	100	100	80-100	5-35	0-20	NP-4
TdA:												
Tedrow----------	0-8	Loamy fine sand	SM	A-2, A-4	0	0	100	95-100	60-80	20-45	0-14	NP
	8-31	Loamy fine sand	SM	A-2, A-4	0	0	100	95-100	60-80	20-45	0-14	NP
	31-60	Fine sand	SM, SP-SM	A-2, A-3	0	0	100	100	70-90	5-35	0-14	NP
TeA:												
Tedrow Variant--	0-9	Loamy fine sand	SM	A-2, A-4	0	0	100	95-100	60-80	20-45	0-14	NP
	9-35	Loamy fine sand	SM	A-2, A-4	0	0	100	95-100	60-80	20-45	0-14	NP
	35-50	Stratified fine sand to silt	ML, CL-ML, SM	A-2, A-4	0	0	100	100	65-100	25-75	0-14	NP
To:												
Toledo----------	0-7	Silty clay loam	MH, CL-ML, CL	A-6, A-7	0	0	100	100	90-100	85-100	38-54	14-24
	7-24	Silty clay	CH, CL	A-7	0	0	100	100	90-100	90-100	40-65	18-36
	24-68	Silty clay, silty clay loam	CH, CL-ML	A-7	0	0	100	100	90-100	90-100	40-65	18-36
Tt:												
Toledo----------	0-7	Silty clay	CH, CL, MH	A-7	0	0	100	100	90-100	85-100	40-65	18-32
	7-24	Silty clay	CH, CL	A-7	0	0	100	100	90-100	90-100	40-65	18-36
	24-68	Silty clay, silty clay loam	CL-ML, CH	A-7	0	0	100	100	90-100	90-100	40-65	18-36
TuB2:												
Tuscola---------	0-7	Loam	CL-ML, ML	A-4	0	0	100	100	80-90	60-80	20-30	3-10
	7-27	Silt loam, loam, silty clay loam	ML, CL-ML	A-4	0	0	100	100	80-100	65-90	20-40	6-20
	27-68	Stratified fine sand to silt loam	ML, CL-ML	A-4	0	0	100	100	65-95	55-90	0-25	NP-4
TuC2:												
Tuscola---------	0-7	Loam	CL-ML, ML	A-4	0	0	100	100	80-90	60-80	20-30	3-10
	7-27	Silt loam, loam, silty clay loam	ML, CL-ML	A-4, A-6	0	0	100	100	80-100	65-90	20-40	6-20
	27-68	Stratified fine sand to silt loam	ML, CL-ML	A-4	0	0	100	100	55-95	55-90	0-25	NP-4

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Ud:												
Udorthents	---	---	---	---	---	---	---	---	---	---	---	---
Ur:												
Urban Land	---	---	---	---	---	---	---	---	---	---	---	---
VaA:												
Vaughnsville	0-9	Loam	CL-ML, ML	A-4	0	0	90-100	85-100	65-85	55-75	20-35	2-10
	9-30	Loam, sandy clay loam, sandy loam	CL, SC	A-2, A-6	0	0	90-100	60-90	45-70	20-55	24-40	8-20
	30-60	Silty clay, clay, clay loam	CH, CL	A-6, A-7	0	0-2	95-100	90-100	85-100	75-95	25-45	11-22
W:												
Water	---	---	---	---	---	---	---	---	---	---	---	---
Wa:												
Wabasha	0-16	Silty clay	ML, CL	A-7, A-6	0	0	95-100	90-100	85-100	80-100	45-60	25-35
	16-48	Silty clay	CH, CL-ML	A-7, A-6	0	0	100	90-100	85-100	85-95	45-65	22-35
	48-70	Silty clay, clay	CH, CL-ML	A-7, A-6	0	0	100	100	90-100	85-100	40-65	18-35
Wc:												
Warners	0-8	Muck	OL, PT		0	0	0	0	0	0	15-30	2-15
	8-12	Sandy clay loam, mucky silty clay loam	CL, SC	A-6	0	0	100	100	80-90	35-55	25-45	10-20
	12-31	Marl	ML	A-4	0	0	100	100	85-100	65-90	---	NP
	31-50	Fine sand	SM, SP-SM	A-3, A-2	0	0	100	100	75-95	5-30	0-14	NP
Wf:												
Wauseon	0-27	Fine sandy loam	ML, SM	A-2, A-4	0	0	95-100	90-100	70-85	25-55	0-14	NP
	27-40	Fine sandy loam, loamy fine sand, fine sand	SM	A-2, A-4	0	0	95-100	90-100	65-95	20-40	0-14	NP
	40-60	Clay, silty clay	CH, CL-ML	A-7, A-6	0	0-2	95-100	90-100	90-100	80-95	40-70	18-36
Wg:												
Wauseon	0-22	Loamy fine sand	ML, SM	A-2, A-4	0	0	95-100	90-100	70-85	25-55	0-14	NP
	22-60	Stratified sand to clay loam to clay	CH, CL, MH, ML	A-7	0	0-2	90-100	85-100	55-85	30-60	25-40	5-20

TABLE 29.--PHYSICAL PROPERTIES OF THE SOILS

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" apply only to the surface layer. Absence of an entry indicates that data were not estimated. See text on page 205 for additional information.)

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Shrink- swell potential	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi- bility group
	In	Pct	g/cc	In/hr	In/in					
Ad:										
Adrian----------	0-22	0-0	0.30-0.55	0.20-6.00	0.22-0.26	---	---	---	2	2
	22-50	2-10	1.40-1.75	6.00-20.00	0.02-0.04	Low	.15	.15		
ArB:										
Arkport---------	0-24	5-15	1.10-1.40	6.00-12.00	0.02-0.05	Low	.17	.17	5	1
	24-58	3-15	1.25-1.55	2.00-6.00	0.10-0.16	Low	.28	.28		
	58-75	1-5	1.25-1.55	6.00-12.00	0.02-0.05	Low	.28	.28		
ArC:										
Arkport---------	0-6	5-15	1.10-1.40	6.00-12.00	0.08-0.09	Low	.17	.17	5	1
	6-55	3-15	1.25-1.55	2.00-6.00	0.06-0.16	Low	.28	.28		
	55-79	1-5	1.25-1.55	6.00-12.00	0.02-0.06	Low	.28	.28		
AsA:										
Aurand----------	0-10	10-18	1.30-1.45	2.00-6.00	0.12-0.18	Low	.24	.24	4	3
	10-30	18-35	1.30-1.70	0.60-2.00	0.12-0.16	Low	.24	.28		
	30-38	15-35	1.30-1.70	0.60-2.00	0.10-0.16	Low	.28	.32		
	38-59	27-42	1.40-1.80	0.06-0.60	0.06-0.10	Moderate	.32	.37		
	59-80	27-42	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
AtA:										
Aurand----------	0-11	12-27	1.30-1.45	0.60-2.00	0.18-0.22	Low	.28	.28	4	5
	11-29	18-35	1.30-1.70	0.60-2.00	0.12-0.16	Low	.24	.28		
	29-33	15-35	1.30-1.70	0.60-2.00	0.10-0.16	Low	.28	.32		
	33-48	27-42	1.40-1.80	0.06-0.60	0.06-0.10	Moderate	.32	.37		
	48-80	27-42	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
BcA:										
Bixler----------	0-10	5-15	1.25-1.40	6.00-20.00	0.07-0.13	Low	.17	.17	5	2
	10-22	5-15	1.25-1.40	6.00-20.00	0.06-0.12	Low	.15	.15		
	22-25	5-25	1.30-1.45	0.60-2.00	0.12-0.18	Low	.37	.37		
	25-60	5-32	1.45-1.75	0.60-2.00	0.08-0.18	Moderate	.37	.37		
Ca:										
Clay pits-------	---	---	---	---	---	---	---	---	-	---
Ch:										
Cohoctah--------	0-44	5-20	1.20-1.50	2.00-6.00	0.07-0.10	Low	.24	.24	5	3
	44-62	5-18	1.45-1.65	2.00-6.00	0.04-0.08	Low	.28	.28		
	62-71	2-18	1.45-1.65	6.00-12.00	0.02-0.05	Low	.28	.28		
Ck:										
Colwood---------	0-8	2-18	1.30-1.60	2.00-6.00	0.16-0.20	Low	.20	.20	5	3
	8-38	18-35	1.30-1.60	0.20-2.00	0.17-0.22	Low	.43	.43		
	38-60	0-12	1.45-1.65	0.60-2.00	0.08-0.22	Low	.43	.43		
Cm:										
Colwood---------	0-8	7-26	1.30-1.60	0.60-6.00	0.20-0.24	Low	.28	.28	5	5
	8-38	18-35	1.30-1.60	0.20-2.00	0.17-0.22	Low	.43	.43		
	38-60	0-12	1.45-1.65	0.60-2.00	0.08-0.22	Low	.43	.43		
Cn:										
Colwood---------	0-11	5-26	1.30-1.60	0.60-2.00	0.16-0.22	Low	.28	.28	5	5
	11-48	18-35	1.30-1.60	0.20-0.60	0.14-0.18	Moderate	.43	.43		
	48-65	0-12	1.45-1.65	0.60-2.00	0.15-0.20	Low	.43	.43		

TABLE 29.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility	Available water capacity	Shrink-swell potential	Erosion factors Kw	Kf	T	Wind erodi-bility group
	In	Pct	g/cc	In/hr	In/in					
Co:										
Colwood	0-11	5-26	1.30-1.60	0.60-2.00	0.16-0.22	Low	.28	.28	5	5
	11-48	18-35	1.30-1.60	0.60-2.00	0.14-0.18	Low	.43	.43		
	48-65	0-12	1.45-1.65	0.60-2.00	0.15-0.20	Low	.43	.43		
Cu:										
Cut and fill land	---	---	---	---	---	---	---	---	-	---
DeA:										
Del Rey	0-9	15-27	1.30-1.50	0.60-2.00	0.15-0.20	Low	.43	.43	5	6
	9-34	35-45	1.40-1.65	0.06-0.20	0.16-0.19	Moderate	.43	.43		
	34-52	25-35	1.50-1.70	0.06-0.20	0.15-0.19	Moderate	.43	.43		
DfA:										
Del Rey	0-9	15-27	1.30-1.50	0.60-2.00	0.15-0.20	Low	.43	.43	5	6
	9-34	35-45	1.40-1.65	0.06-0.20	0.16-0.19	Moderate	.43	.43		
	34-52	25-35	1.50-1.70	0.06-0.20	0.15-0.19	Moderate	.43	.43		
DuA:										
Digby	0-9	7-18	1.20-1.40	2.00-6.00	0.10-0.16	Low	.24	.28	4	3
	9-37	18-35	1.45-1.70	0.60-2.00	0.14-0.18	Low	.32	.37		
	37-50	3-15	1.25-1.55	6.00-12.00	0.02-0.04	Low	.10	.20		
DyA:										
Digby	0-9	12-20	1.20-1.40	0.60-2.00	0.16-0.22	Low	.32	.37	4	5
	9-37	18-35	1.45-1.70	0.60-2.00	0.14-0.18	Low	.32	.37		
	37-50	3-15	1.25-1.55	6.00-12.00	0.02-0.04	Low	.10	.20		
DzA:										
Digby	0-9	12-20	1.20-1.40	0.60-2.00	0.16-0.22	Low	.32	.37	4	5
	9-20	18-35	1.45-1.70	0.60-2.00	0.12-0.16	Low	.32	.37		
	20-35	18-35	1.40-1.60	0.60-2.00	0.08-0.15	Low	.32	.55		
	35-60	3-15	1.25-1.55	6.00-20.00	0.02-0.09	Low	.10	.20		
Ee:										
Eel	0-8	18-27	1.30-1.50	0.60-2.00	0.20-0.24	Low	.32	.32	5	6
	8-38	20-32	1.30-1.50	0.60-2.00	0.17-0.22	Low	.32	.32		
	38-60	8-25	1.30-1.50	0.60-6.00	0.19-0.21	Low	.28	.32		
FsA:										
Fulton	0-9	16-27	1.30-1.50	0.60-2.00	0.20-0.24	Low	.43	.43	5	6
	9-32	45-60	1.40-1.65	0.06-0.20	0.13-0.16	High	.32	.32		
	32-60	35-50	1.45-1.65	0.06-0.20	0.06-0.10	High	.32	.32		
FsB:										
Fulton	0-9	16-27	1.30-1.50	0.60-2.00	0.20-0.24	Low	.43	.43	5	6
	9-32	45-60	1.40-1.65	0.06-0.20	0.13-0.16	High	.32	.32		
	32-60	35-50	1.45-1.65	0.06-0.20	0.06-0.10	High	.32	.32		
FuA:										
Fulton	0-9	27-40	1.35-1.55	0.20-0.60	0.21-0.23	Moderate	.43	.43	5	6
	9-32	45-60	1.40-1.65	0.06-0.20	0.13-0.16	High	.32	.32		
	32-60	35-50	1.45-1.65	0.06-0.20	0.06-0.10	High	.32	.32		
FuB:										
Fulton	0-9	27-40	1.35-1.55	0.20-0.60	0.16-0.19	Moderate	.43	.43	5	6
	9-32	45-60	1.40-1.65	0.06-0.20	0.13-0.16	High	.32	.32		
	32-60	35-50	1.45-1.65	0.06-0.20	0.06-0.10	High	.32	.32		

TABLE 29.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility	Available water capacity	Shrink-swell potential	Erosion factors Kw	Kf	T	Wind erodi-bility group
	In	Pct	g/cc	In/hr	In/in					
FvA:										
Fulton Variant--	0-9	15-27	1.30-1.50	0.20-0.60	0.16-0.19	Moderate	.32	.32	5	6
	9-33	35-50	1.40-1.60	0.06-0.20	0.13-0.16	High	.32	.32		
	33-57	8-18	1.35-1.60	0.60-6.00	0.12-0.18	Low	.24	.28		
	57-64	4-15	1.40-1.70	0.06-0.20	0.06-0.10	Moderate	.17	.20		
GaA:										
Galen-----------	0-28	1-4	1.33-1.68	6.00-12.00	0.06-0.12	Low	.15	.15	5	1
	28-79	1-4	1.45-1.70	2.00-6.00	0.10-0.16	Low	.28	.28		
	79-92	1-4	1.45-1.70	6.00-12.00	0.02-0.05	Low	.17	.17		
GaB:										
Galen-----------	0-28	1-4	1.33-1.68	6.00-12.00	0.06-0.12	Low	.15	.15	5	1
	28-79	1-4	1.45-1.70	2.00-6.00	0.10-0.16	Low	.28	.28		
	79-92	1-4	1.45-1.70	6.00-12.00	0.02-0.05	Low	.17	.17		
GbB:										
Galen-----------	0-10	1-4	1.33-1.68	0.60-6.00	0.08-0.09	Low	.17	.17	5	2
	10-28	2-8	1.45-1.70	0.60-6.00	0.08-0.16	Low	.28	.28		
	28-58	1-4	1.45-1.70	0.60-6.00	0.06-0.16	Low	.28	.28		
	58-68	1-4	1.45-1.70	2.00-6.00	0.06-0.09	Low	.17	.17		
Gm:										
Genesee---------	0-20	18-27	1.30-1.50	0.60-2.00	0.18-0.22	Low	.37	.37	5	6
	20-52	10-20	1.30-1.50	0.60-2.00	0.17-0.19	Low	.37	.37		
Go:										
Gilford---------	0-32	10-20	1.50-1.70	2.00-6.00	0.10-0.15	Low	.10	.10	5	3
	32-60	2-10	1.70-1.90	6.00-20.00	0.02-0.05	Low	.15	.15		
Gr:										
Granby----------	0-20	2-14	1.20-1.60	6.00-12.00	0.08-0.12	Low	.17	.17	5	2
	20-63	0-10	1.45-1.65	6.00-12.00	0.02-0.05	Low	.17	.17		
Gv:										
Gravel pits-----	---	---	---	---	---	---	---	---	-	---
HaA:										
Haney-----------	0-12	7-18	1.40-1.60	2.00-6.00	0.14-0.18	Low	.32	.37	4	3
	12-28	15-25	1.25-1.60	0.60-2.00	0.10-0.15	Low	.32	.37		
	28-42	20-35	1.25-1.60	0.60-2.00	0.14-0.18	Low	.32	.64		
	42-80	3-15	1.25-1.55	6.00-20.00	0.04-0.08	Low	.24	---		
HaB:										
Haney-----------	0-12	7-18	1.40-1.60	2.00-6.00	0.14-0.18	Low	.32	.37	4	3
	12-28	15-25	1.25-1.60	0.60-2.00	0.10-0.15	Low	.32	.37		
	28-42	20-35	1.25-1.60	0.60-2.00	0.14-0.18	Low	.32	.64		
	42-80	3-15	1.25-1.55	6.00-20.00	0.04-0.08	Low	.24	---		
HdA:										
Haney-----------	0-12	12-20	1.30-1.50	0.60-2.00	0.14-0.18	Low	.32	.37	4	5
	12-28	15-25	1.25-1.60	0.60-2.00	0.10-0.15	Low	.32	.37		
	28-42	20-35	1.25-1.60	0.60-2.00	0.14-0.18	Low	.32	.64		
	42-80	3-15	1.25-1.55	6.00-20.00	0.04-0.08	Low	.24	---		
HdB:										
Haney-----------	0-12	12-20	1.30-1.50	0.60-2.00	0.16-0.22	Low	.32	.37	4	5
	12-28	15-25	1.25-1.60	0.60-2.00	0.10-0.15	Low	.32	.37		
	28-42	20-35	1.25-1.60	0.60-2.00	0.14-0.18	Low	.32	.64		
	42-80	3-15	1.25-1.55	6.00-20.00	0.04-0.08	Low	.24	---		

TABLE 29.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Shrink- swell potential	Erosion factors			Wind erodi- bility group
							Kw	Kf	T	
	In	Pct	g/cc	In/hr	In/in					
HeC:										
Haney-----------	0-12	12-20	1.30-1.50	0.60-2.00	0.16-0.22	Low	.32	.37	4	5
	12-28	15-25	1.25-1.60	0.60-2.00	0.10-0.15	Low	.32	.37		
	28-42	20-35	1.25-1.60	0.60-2.00	0.14-0.18	Low	.32	.64		
	42-80	3-15	1.25-1.55	6.00-20.00	0.04-0.08	Low	.24	---		
Rawson----------	0-12	12-20	1.35-1.50	0.60-2.00	0.18-0.22	Low	.32	.37	4	5
	12-26	18-35	1.50-1.70	0.60-2.00	0.14-0.18	Low	.32	.49		
	26-60	35-55	1.60-1.85	0.01-0.06	0.06-0.08	Moderate	.32	.32		
HkA:										
Haskins---------	0-7	10-18	1.30-1.45	0.60-2.00	0.12-0.18	Low	.24	.24	4	3
	7-24	18-35	1.45-1.70	0.60-2.00	0.14-0.18	Low	.37	.43		
	24-60	35-55	1.60-1.80	0.01-0.06	0.06-0.08	High	.37	.37		
HlA:										
Haskins---------	0-7	12-20	1.30-1.45	0.60-2.00	0.14-0.22	Low	.37	.37	4	5
	7-24	18-35	1.45-1.70	0.60-2.00	0.14-0.18	Low	.37	.37		
	24-60	35-55	1.60-1.80	0.01-0.06	0.06-0.08	High	.37	.37		
HlB:										
Haskins---------	0-16	12-20	1.30-1.45	0.60-2.00	0.15-0.22	Low	.37	.37	4	5
	16-30	18-35	1.45-1.70	0.60-2.00	0.10-0.14	Low	.37	.43		
	30-60	35-55	1.60-1.80	0.01-0.06	0.07-0.11	High	.37	.37		
HnA:										
Haskins---------	0-7	10-18	1.30-1.45	0.60-2.00	0.12-0.18	Low	.24	.24	4	3
	7-24	18-35	1.45-1.70	0.60-2.00	0.14-0.18	Low	.37	.43		
	24-40	35-55	1.60-1.80	0.01-0.06	0.06-0.10	High	.37	.37		
	40-49	20-35	---	0.60-2.00	0.14-0.18	Moderate	---	---		
	49-55	40-60	---	0.01-0.20	0.06-0.08	High	---	---		
	55-62	8-20	---	0.60-2.00	0.12-0.15	Low	---	---		
	62-64	40-60	---	0.01-0.20	0.06-0.08	High	---	---		
Ho:										
Hoytville-------	0-7	27-40	1.25-1.50	0.60-2.00	0.14-0.18	High	.24	.24	5	6
	7-37	40-55	1.35-1.60	0.20-0.60	0.12-0.17	High	.28	.32		
	37-60	35-50	1.40-1.80	0.06-0.20	0.06-0.10	High	.28	.32		
Hp:										
Hoytville-------	0-9	27-40	1.25-1.50	0.20-2.00	0.19-0.23	Moderate	.28	.28	5	7
	9-43	40-55	1.35-1.60	0.20-0.60	0.08-0.13	Moderate	.28	.32		
	43-58	35-50	1.40-1.75	0.06-0.20	0.05-0.10	Moderate	.32	.37		
	58-80	27-42	1.70-1.90	0.01-0.20	0.01-0.05	Moderate	.32	.37		
Hr:										
Hoytville-------	0-9	27-40	1.25-1.50	0.20-2.00	0.19-0.23	Moderate	.24	.24	5	6
	9-52	40-55	1.35-1.60	0.20-0.60	0.08-0.13	Moderate	.28	.32		
	52-60	35-50	1.40-1.75	0.06-0.20	0.05-0.10	Moderate	.32	.37		
	60-80	27-42	1.70-1.90	0.01-0.20	0.01-0.05	Moderate	.32	.37		
Hs:										
Hoytville-------	0-8	40-48	1.30-1.55	0.20-0.60	0.10-0.14	Moderate	.28	.28	5	4
	8-41	40-55	1.35-1.60	0.20-0.60	0.08-0.13	Moderate	.28	.32		
	41-60	35-50	1.40-1.75	0.06-0.20	0.05-0.10	Moderate	.32	.37		
	60-80	27-42	1.70-1.90	0.01-0.20	0.01-0.05	Moderate	.32	.37		
Hv:										
Hoytville-------	0-7	40-48	1.30-1.55	0.20-0.60	0.10-0.14	High	.28	.28	5	4
	7-37	40-55	1.40-1.80	0.20-0.60	0.12-0.17	High	.28	.32		
	37-60	35-50	1.40-1.80	0.06-0.20	0.06-0.10	High	.28	.32		

TABLE 29.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Shrink- swell potential	Erosion factors			Wind erodi- bility group
							Kw	Kf	T	
	In	Pct	g/cc	In/hr	In/in					
Hw:										
Hoytville Variant--------	0-13	40-45	1.35-1.55	0.20-0.60	0.12-0.17	High	.28	.28	5	4
	13-44	35-45	1.40-1.80	0.06-0.20	0.06-0.10	High	.43	.43		
KeA:										
Kibbie----------	0-16	0-15	1.40-1.65	2.00-6.00	0.13-0.18	Low	.17	.17	5	2
	16-36	18-35	1.40-1.65	0.60-2.00	0.17-0.22	Low	.32	.32		
	36-60	2-18	1.40-1.70	0.60-2.00	0.12-0.22	Low	.32	.32		
KfA:										
Kibbie----------	0-15	2-20	1.40-1.65	0.60-2.00	0.14-0.18	Low	.20	.20	5	3
	15-38	18-35	1.40-1.65	0.60-2.00	0.14-0.18	Low	.43	.43		
	38-72	2-18	1.40-1.70	0.60-2.00	0.10-0.16	Low	.43	.43		
KlA:										
Kibbie----------	0-12	5-25	1.40-1.65	0.60-2.00	0.16-0.24	Low	.28	.28	5	5
	12-38	18-35	1.40-1.65	0.60-2.00	0.14-0.18	Low	.43	.43		
	38-71	2-18	1.40-1.70	0.60-2.00	0.10-0.16	Low	.43	.43		
La:										
Latty-----------	0-8	40-55	1.30-1.50	0.20-0.60	0.14-0.17	High	.28	.28	5	4
	8-41	45-60	1.35-1.65	0.06-0.20	0.12-0.15	High	.28	.28		
	41-71	35-45	1.50-1.70	0.01-0.06	0.04-0.08	High	.28	.28		
Lb:										
Latty-----------	0-9	40-55	1.30-1.50	0.06-0.20	0.11-0.14	High	.28	.28	5	4
	9-44	45-60	1.35-1.65	0.06-0.20	0.09-0.13	High	.28	.28		
	44-60	45-60	1.45-1.60	0.01-0.06	0.08-0.12	High	.28	.28		
Le:										
Lenawee---------	0-8	15-27	1.40-1.55	0.60-2.00	0.17-0.19	Low	.24	.24	5	6
	8-43	35-45	1.40-1.65	0.20-0.60	0.15-0.18	High	.37	.37		
	43-61	18-40	1.50-1.65	0.20-0.60	0.06-0.10	Moderate	.37	.37		
Lf:										
Lenawee---------	0-8	27-35	1.40-1.55	0.20-0.60	0.17-0.19	Moderate	.28	.28	5	6
	8-43	35-45	1.40-1.65	0.20-0.60	0.15-0.18	High	.37	.37		
	43-61	18-40	1.50-1.65	0.20-0.60	0.06-0.10	Moderate	.37	.37		
LwB2:										
Lucas-----------	0-5	27-40	1.35-1.55	0.20-0.60	0.16-0.19	Moderate	.43	.43	5	6
	5-25	45-60	1.40-1.70	0.06-0.20	0.12-0.15	High	.32	.32		
	25-60	35-60	1.45-1.70	0.01-0.20	0.06-0.10	High	.32	.32		
LwC2:										
Lucas-----------	0-5	27-40	1.35-1.55	0.20-0.60	0.16-0.19	Moderate	.43	.43	5	6
	5-25	45-60	1.40-1.70	0.06-0.20	0.12-0.14	High	.32	.32		
	25-60	35-60	1.45-1.70	0.01-0.20	0.06-0.10	High	.32	.32		
LxC3:										
Lucas-----------	0-5	40-50	1.20-1.40	0.20-0.60	0.16-0.18	Moderate	.32	.32	4	4
	5-25	45-60	1.40-1.70	0.06-0.20	0.12-0.14	High	.32	.32		
	25-60	35-60	1.45-1.70	0.01-0.20	0.06-0.10	High	.32	.32		
LxE3:										
Lucas-----------	0-5	40-50	1.20-1.40	0.20-0.60	0.16-0.18	Moderate	.32	.32	4	4
	5-25	45-60	1.40-1.70	0.06-0.20	0.12-0.14	High	.32	.32		
	25-60	35-60	1.45-1.70	0.01-0.20	0.07-0.10	High	.32	.32		

TABLE 29.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Shrink- swell potential	Erosion factors Kw	Kf	T	Wind erodi- bility group
	In	Pct	g/cc	In/hr	In/in					
Mb:										
Mermill---------	0-9	14-27	1.25-1.50	0.60-2.00	0.18-0.24	Low	.32	.32	4	6
	9-35	18-35	1.50-1.70	0.60-2.00	0.12-0.16	Low	.28	.32		
	35-46	27-42	1.60-1.80	0.01-0.20	0.06-0.10	Moderate	.28	.32		
	46-80	27-42	1.60-1.80	0.01-0.20	0.05-0.10	Moderate	.28	.32		
Aurand----------	0-11	12-27	1.30-1.45	0.60-2.00	0.18-0.22	Low	.28	.28	4	5
	11-23	18-35	1.30-1.70	0.60-2.00	0.12-0.16	Low	.24	.28		
	23-29	15-35	1.30-1.70	0.60-2.00	0.10-0.16	Low	.28	.32		
	29-51	27-42	1.40-1.80	0.06-0.60	0.06-0.10	Moderate	.32	.37		
	51-80	27-42	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
Mc:										
Mermill---------	0-9	27-32	1.35-1.55	0.60-2.00	0.16-0.22	Moderate	.37	.37	4	6
	9-20	18-35	1.50-1.69	0.60-2.00	0.13-0.17	Moderate	.28	.32		
	20-34	18-35	1.50-1.69	0.60-2.00	0.11-0.14	Moderate	.28	.32		
	34-60	35-55	1.60-1.75	0.01-0.06	0.09-0.12	High	.28	.28		
Md:										
Medway----------	0-18	18-27	1.20-1.45	0.60-2.00	0.17-0.19	Low	.28	.28	5	6
	18-60	18-32	1.20-1.50	0.60-2.00	0.16-0.18	Low	.32	.37		
Me:										
Mermill---------	0-9	14-27	1.25-1.50	0.60-2.00	0.16-0.22	Low	.32	.37	4	6
	9-40	18-35	1.50-1.69	0.60-2.00	0.14-0.18	Moderate	.28	.32		
	40-60	35-55	1.60-1.75	0.01-0.06	0.06-0.08	High	.28	.28		
Mf:										
Mermill---------	0-9	27-32	1.35-1.55	0.60-2.00	0.15-0.19	Moderate	.32	.32	4	6
	9-40	18-35	1.50-1.70	0.60-2.00	0.14-0.18	Moderate	.28	.32		
	40-60	35-55	1.60-1.75	0.01-0.06	0.06-0.08	High	.28	.28		
Mg:										
Mermill---------	0-9	14-27	1.25-1.50	0.60-2.00	0.16-0.22	Low	.32	.32	4	6
	9-40	18-35	1.50-1.69	0.60-2.00	0.14-0.18	Moderate	.28	.32		
	40-66	35-55	1.60-1.75	0.01-0.20	0.06-0.10	Moderate	.28	.28		
Mh:										
Millgrove-------	0-12	18-27	1.30-1.50	0.60-2.00	0.14-0.20	Low	.24	.28	5	6
	12-42	18-35	1.40-1.70	0.60-2.00	0.14-0.18	Moderate	.28	.32		
	42-72	5-18	1.25-1.60	6.00-12.00	0.02-0.04	Low	.28	.55		
Mk:										
Millgrove-------	0-12	27-32	1.35-1.55	0.60-2.00	0.14-0.20	Moderate	.24	.28	5	6
	12-42	18-35	1.40-1.70	0.60-2.00	0.14-0.18	Moderate	.28	.32		
	42-72	5-18	1.25-1.60	6.00-12.00	0.02-0.04	Low	.28	.55		
NaA:										
Nappanee--------	0-12	20-27	1.30-1.50	0.60-2.00	0.20-0.24	Low	.37	.37	3	6
	12-24	45-60	1.40-1.65	0.06-0.20	0.14-0.17	Moderate	.37	.37		
	24-60	35-50	1.50-1.75	0.01-0.06	0.06-0.08	Moderate	.37	.37		
NaB:										
Nappanee--------	0-12	20-27	1.30-1.50	0.60-2.00	0.20-0.24	Low	.37	.37	3	6
	12-24	45-60	1.40-1.65	0.06-0.20	0.14-0.17	Moderate	.37	.37		
	24-60	35-50	1.50-1.75	0.01-0.06	0.06-0.08	Moderate	.37	.37		
NtA:										
Nappanee--------	0-12	32-40	1.30-1.50	0.20-0.60	0.16-0.19	Moderate	.43	.43	4	4
	12-24	45-60	1.40-1.65	0.06-0.20	0.14-0.17	Moderate	.37	.37		
	24-60	35-50	1.50-1.75	0.01-0.06	0.06-0.08	Moderate	.37	.37		

TABLE 29.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility	Available water capacity	Shrink-swell potential	Erosion factors Kw	Kf	T	Wind erodi-bility group
	In	Pct	g/cc	In/hr	In/in					
NtB:										
Nappanee--------	0-12	32-40	1.30-1.50	0.20-0.60	0.16-0.19	Moderate	.43	.43	4	4
	12-24	45-60	1.40-1.65	0.06-0.20	0.14-0.17	Moderate	.37	.37		
	24-60	35-50	1.50-1.75	0.01-0.06	0.06-0.08	Moderate	.37	.37		
NtB2:										
Nappanee--------	0-12	32-40	1.30-1.50	0.20-0.60	0.16-0.19	Moderate	.43	.43	4	4
	12-24	45-60	1.40-1.65	0.06-0.20	0.14-0.17	Moderate	.37	.37		
	24-60	35-50	1.50-1.75	0.01-0.06	0.06-0.08	Moderate	.37	.37		
OaC:										
Oakville--------	0-9	0-10	1.30-1.55	6.00-12.00	0.02-0.04	Low	.15	.15	5	1
	9-100	0-10	1.30-1.65	6.00-12.00	0.02-0.04	Low	.15	.15		
ObB:										
Oakville--------	0-6	0-10	1.30-1.55	20.00-99.90	0.07-0.09	Low	.15	.15	5	1
	6-18	0-10	1.30-1.65	20.00-99.90	0.06-0.08	Low	.15	.15		
	18-80	0-10	1.40-1.65	20.00-99.90	0.06-0.08	Low	.15	.15		
ObC:										
Oakville--------	0-9	0-10	1.30-1.55	6.00-20.00	0.07-0.09	Low	.15	.15	5	1
	9-39	0-10	1.30-1.65	6.00-20.00	0.06-0.10	Low	.15	.15		
	39-60	0-10	1.40-1.65	6.00-20.00	0.05-0.07	Low	.15	.15		
OsB:										
Oshtemo---------	0-29	2-10	1.20-1.60	2.00-6.00	0.10-0.14	Low	.24	.24	5	3
	29-44	5-15	1.20-1.60	2.00-6.00	0.08-0.12	Low	.17	.24		
	44-70	0-15	1.20-1.50	2.00-6.00	0.10-0.14	Low	.10	.24		
OtB:										
Ottokee---------	0-47	2-10	1.40-1.60	6.00-12.00	0.02-0.04	Low	.15	.15	5	1
	47-49	1-12	1.50-1.70	2.00-6.00	0.06-0.08	Low	.17	.17		
	49-81	1-8	1.50-1.70	6.00-12.00	0.02-0.04	Low	.17	.17		
OuB:										
Ottokee---------	0-8	2-10	1.40-1.60	6.00-20.00	0.07-0.11	Low	.15	.15	5	1
	8-60	1-12	1.50-1.70	6.00-20.00	0.06-0.10	Low	.17	.17		
	60-78	1-8	1.50-1.70	6.00-20.00	0.03-0.06	Low	.17	.17		
OzB:										
Ottokee---------	0-11	2-10	1.40-1.60	6.00-20.00	0.09-0.12	Low	.17	.17	5	2
	11-47	1-12	1.50-1.70	6.00-20.00	0.06-0.10	Low	.17	.17		
	47-60	1-8	1.50-1.70	6.00-20.00	0.03-0.06	Low	.15	.15		
Spinks----------	0-7	2-10	1.40-1.60	6.00-20.00	0.08-0.10	Low	.15	.17	5	2
	7-48	0-15	1.40-1.70	2.00-20.00	0.05-0.10	Low	.17	.17		
	48-60	3-15	1.40-1.70	2.00-6.00	0.04-0.08	Low	.17	.17		
Pa:										
Paulding--------	0-8	40-65	1.20-1.40	0.06-0.20	0.14-0.17	High	.28	.28	5	4
	8-50	60-80	1.35-1.50	0.01-0.06	0.12-0.15	High	.28	.28		
	50-60	60-75	1.40-1.55	0.01-0.06	0.06-0.08	High	.28	.28		
Pt:										
Pits, quarry----	---	---	---	---	---	---	---	---	-	---
RaB:										
Rawson----------	0-12	9-18	1.30-1.45	0.60-2.00	0.12-0.15	Low	.24	.28	4	3
	12-26	18-35	1.50-1.70	0.60-2.00	0.14-0.18	Moderate	.32	.49		
	26-60	35-55	1.60-1.85	0.01-0.06	0.06-0.08	High	.32	.32		

TABLE 29.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Shrink- swell potential	Erosion factors Kw	Kf	T	Wind erodi- bility group
	In	Pct	g/cc	In/hr	In/in					
RdB:										
Rawson----------	0-12	12-20	1.35-1.50	0.60-2.00	0.18-0.22	Low	.32	.37	4	5
	12-26	18-35	1.50-1.70	0.60-2.00	0.14-0.18	Moderate	.32	.49		
	26-60	35-55	1.60-1.85	0.01-0.06	0.06-0.08	High	.32	.32		
ReB:										
Rawson----------	0-10	12-20	1.35-1.50	0.60-2.00	0.12-0.15	Low	.24	.28	4	3
	10-35	18-35	1.50-1.70	0.60-2.00	0.14-0.18	Moderate	.32	.49		
	35-60	35-55	1.60-1.85	0.20-2.00	0.06-0.08	High	.32	.32		
RfA:										
Rimer-----------	0-24	3-15	1.40-1.60	6.00-12.00	0.06-0.10	Low	.17	.17	4	2
	24-70	35-55	1.50-1.80	0.01-0.06	0.06-0.08	High	.32	.32		
RgA:										
Rimer-----------	0-9	3-15	1.40-1.60	6.00-20.00	0.07-0.12	Low	.17	.17	4	2
	9-23	5-15	1.40-1.70	6.00-20.00	0.06-0.11	Low	.17	.17		
	23-29	7-18	1.50-1.70	2.00-6.00	0.12-0.17	Low	.17	.17		
	29-60	35-55	1.50-1.85	0.01-0.20	0.08-0.12	High	.32	.32		
RhB:										
Rimer-----------	0-8	3-15	1.40-1.60	6.00-20.00	0.08-0.14	Low	.17	.17	4	2
	8-25	5-15	1.40-1.70	6.00-20.00	0.06-0.12	Low	.17	.17		
	25-27	7-18	1.50-1.70	2.00-6.00	0.12-0.17	Low	.20	.20		
	27-32	30-45	1.60-1.80	0.06-0.20	0.06-0.12	Moderate	.32	.37		
	32-60	27-42	1.60-1.90	0.01-0.20	0.01-0.10	Moderate	.32	.37		
Tedrow----------	0-14	2-10	1.40-1.60	6.00-20.00	0.08-0.12	Low	.17	.17	4	2
	14-34	2-8	1.50-1.70	6.00-20.00	0.07-0.11	Low	.17	.17		
	34-60	27-42	1.70-1.90	0.01-0.20	0.01-0.10	Moderate	.32	.37		
RmA:										
Rimer-----------	0-29	5-15	1.40-1.60	6.00-12.00	0.06-0.10	Low	.17	.17	4	2
	29-64	20-45	1.40-1.70	0.06-0.20	0.10-0.18	Moderate	.32	.32		
RoA:										
Roselms---------	0-6	27-40	1.30-1.60	0.20-0.60	0.15-0.18	High	.43	.43	5	6
	6-25	60-80	1.35-1.60	0.06-0.20	0.12-0.15	High	.32	.32		
	25-60	60-75	1.40-1.60	0.01-0.06	0.06-0.08	High	.32	.32		
RrA:										
Roselms---------	0-8	40-50	1.20-1.55	0.06-0.20	0.11-0.16	High	.32	.32	5	4
	8-32	60-80	1.35-1.60	0.01-0.06	0.09-0.13	High	.32	.32		
	32-60	60-75	1.40-1.60	0.01-0.06	0.08-0.12	High	.32	.32		
Rs:										
Ross------------	0-21	15-27	1.20-1.45	0.60-2.00	0.18-0.22	Low	.32	.32	5	5
	21-61	18-32	1.20-1.50	0.60-2.00	0.18-0.20	Low	.32	.32		
SaE3:										
St. Clair-------	0-3	40-50	1.35-1.50	0.06-0.20	0.14-0.16	High	.32	.32	4	4
	3-22	35-55	1.35-1.70	0.01-0.20	0.10-0.12	High	.37	.37		
	22-60	40-55	1.60-1.75	0.01-0.20	0.09-0.11	High	.37	.37		
SbB2:										
St. Clair-------	0-5	27-40	1.50-1.60	0.60-2.00	0.16-0.20	Moderate	.43	.43	4	6
	5-23	35-55	1.35-1.70	0.06-0.20	0.14-0.17	High	.37	.37		
	23-60	35-55	1.60-1.75	0.01-0.06	0.06-0.08	High	.37	.37		
SbC2:										
St. Clair-------	0-5	27-40	1.50-1.60	0.60-2.00	0.16-0.20	Moderate	.43	.43	4	6
	5-23	35-55	1.35-1.70	0.06-0.20	0.14-0.17	High	.37	.37		
	23-60	35-55	1.60-1.75	0.01-0.06	0.06-0.08	High	.37	.37		

TABLE 29.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Shrink- swell potential	Erosion factors Kw	Kf	T	Wind erodi- bility group
	In	Pct	g/cc	In/hr	In/in					
SbD2:										
St. Clair-------	0-8	27-40	1.50-1.60	0.20-0.60	0.17-0.23	Moderate	.43	.43	4	6
	8-18	40-60	1.35-1.70	0.06-0.20	0.10-0.12	Moderate	.32	.37		
	18-42	35-55	1.60-1.75	0.06-0.20	0.09-0.11	Moderate	.32	.37		
	42-60	27-42	1.60-1.90	0.01-0.20	0.01-0.05	Moderate	.32	.37		
SbE2:										
St. Clair-------	0-8	27-40	1.50-1.60	0.20-0.60	0.17-0.23	Moderate	.43	.43	4	6
	8-18	40-60	1.35-1.70	0.06-0.20	0.10-0.12	Moderate	.32	.37		
	18-42	35-55	1.60-1.75	0.06-0.20	0.09-0.11	Moderate	.32	.37		
	42-60	27-42	1.60-1.90	0.01-0.20	0.01-0.05	Moderate	.32	.37		
ScC3:										
St. Clair-------	0-5	35-50	1.35-1.50	0.06-0.20	0.11-0.14	High	.32	.32	4	4
	5-23	35-55	1.35-1.70	0.06-0.20	0.14-0.17	High	.37	.37		
	23-60	35-55	1.60-1.75	0.01-0.06	0.06-0.08	High	.37	.37		
ScD3:										
St. Clair-------	0-5	35-50	1.35-1.50	0.06-0.20	0.11-0.14	High	.32	.32	4	4
	5-23	35-55	1.35-1.70	0.06-0.20	0.14-0.17	High	.37	.37		
	23-60	35-55	1.60-1.75	0.01-0.06	0.06-0.08	High	.37	.37		
ScE3:										
St. Clair-------	0-5	35-50	1.35-1.50	0.06-0.20	0.11-0.14	High	.32	.32	4	4
	5-23	35-55	1.35-1.70	0.06-0.20	0.14-0.17	High	.37	.37		
	23-60	35-55	1.60-1.75	0.01-0.06	0.06-0.08	High	.37	.37		
ScF3:										
St. Clair-------	0-5	35-50	1.35-1.50	0.06-0.20	0.11-0.14	High	.32	.32	4	4
	5-25	35-55	1.35-1.70	0.06-0.20	0.14-0.17	High	.37	.37		
	25-60	35-55	1.60-1.75	0.01-0.06	0.06-0.08	High	.37	.37		
SdB:										
Seward----------	0-26	3-15	1.40-1.60	6.00-12.00	0.06-0.10	Low	.17	.17	4	2
	26-34	5-18	1.50-1.70	6.00-12.00	0.06-0.10	Low	.17	.17		
	34-60	35-55	1.60-1.82	0.06-0.20	0.04-0.08	High	.32	.32		
SdC:										
Seward----------	0-26	3-15	1.40-1.60	6.00-12.00	0.06-0.10	Low	.17	.17	4	2
	26-34	5-18	1.50-1.70	6.00-12.00	0.06-0.10	Low	.17	.17		
	34-60	35-55	1.60-1.82	0.06-0.20	0.04-0.08	High	.32	.32		
SdD:										
Seward----------	0-26	3-15	1.40-1.60	6.00-12.00	0.06-0.10	Low	.17	.17	4	2
	26-34	5-18	1.50-1.70	6.00-12.00	0.06-0.10	Low	.17	.17		
	34-60	35-55	1.60-1.82	0.06-0.20	0.04-0.08	High	.32	.32		
SeB:										
Seward----------	0-27	3-15	1.40-1.60	6.00-12.00	0.06-0.10	Low	.17	.17	4	2
	27-94	27-40	1.50-1.70	0.01-0.06	0.10-0.16	Moderate	.17	.17		
SeC:										
Seward----------	0-27	3-15	1.40-1.60	6.00-12.00	0.06-0.10	Low	.17	.17	4	2
	27-94	27-40	1.50-1.70	0.01-0.06	0.10-0.16	Moderate	.17	.17		
SfA:										
Shinrock Variant	0-9	18-27	1.30-1.50	0.60-2.00	0.15-0.20	Low	.37	.37	4	6
	9-28	25-45	1.35-1.70	0.20-0.60	0.14-0.18	Moderate	.37	.37		
	28-37	8-45	1.30-1.60	0.20-2.00	0.14-0.16	Moderate	.37	.37		
	37-82	0-6	1.25-1.55	6.00-12.00	0.02-0.04	Low	---	---		

TABLE 29.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility	Available water capacity	Shrink-swell potential	Erosion factors Kw	Kf	T	Wind erodi-bility group
	In	Pct	g/cc	In/hr	In/in					
Sh:										
Shoals----------	0-3	18-27	1.30-1.50	0.60-2.00	0.18-0.22	Low	.37	.37	5	6
	3-31	18-33	1.35-1.55	0.60-2.00	0.14-0.18	Low	.37	.37		
	31-60	12-25	1.35-1.60	0.60-2.00	0.14-0.18	Low	.37	.37		
Sm:										
Sloan-----------	0-10	27-35	1.30-1.50	0.60-2.00	0.18-0.22	Moderate	.28	.28	5	6
	10-26	22-35	1.25-1.55	0.20-2.00	0.15-0.19	Low	.32	.37		
	26-60	10-30	1.20-1.50	0.20-2.00	0.13-0.18	Low	.32	.43		
Sn:										
Sloan-----------	0-12	15-27	1.20-1.40	0.60-2.00	0.20-0.24	Low	.28	.28	5	6
	12-36	22-35	1.25-1.55	0.20-2.00	0.15-0.19	Moderate	.37	.37		
	36-67	10-30	1.20-1.50	0.20-2.00	0.13-0.18	Low	.37	.43		
So:										
Sloan-----------	0-12	27-33	1.25-1.50	0.60-2.00	0.17-0.20	Moderate	.28	.28	5	6
	12-43	22-35	1.25-1.55	0.20-2.00	0.16-0.18	Moderate	.37	.37		
	43-72	10-30	1.20-1.50	0.20-2.00	0.16-0.19	Low	.37	.43		
SpB:										
Spinks----------	0-23	0-10	1.40-1.70	6.00-12.00	0.04-0.07	Low	.10	.15	5	1
	23-100	3-15	1.40-1.70	2.00-6.00	0.02-0.06	Low	.15	.17		
	100-153	0-10	1.40-1.70	6.00-12.00	0.02-0.04	Low	.15	.17		
SpC:										
Spinks----------	0-23	0-10	1.40-1.70	6.00-12.00	0.04-0.07	Low	.10	.15	5	1
	23-100	3-15	1.40-1.70	2.00-6.00	0.02-0.06	Low	.15	.17		
	100-153	0-10	1.40-1.70	6.00-12.00	0.02-0.04	Low	.15	.17		
SpD:										
Spinks----------	0-23	0-10	1.40-1.70	6.00-12.00	0.04-0.07	Low	.10	.15	5	1
	23-100	3-15	1.40-1.70	2.00-6.00	0.02-0.06	Low	.15	.17		
	100-153	0-10	1.40-1.70	6.00-12.00	0.02-0.04	Low	.15	.17		
TdA:										
Tedrow----------	0-8	2-10	1.40-1.60	6.00-12.00	0.06-0.09	Low	.17	.17	5	2
	8-31	2-8	1.50-1.70	6.00-12.00	0.06-0.09	Low	.17	.17		
	31-60	1-8	1.50-1.70	6.00-12.00	0.02-0.04	Low	.17	.17		
TeA:										
Tedrow Variant--	0-9	2-10	1.40-1.60	6.00-12.00	0.06-0.09	Low	.17	.17	5	2
	9-35	2-8	1.50-1.70	6.00-12.00	0.06-0.09	Low	.17	.17		
	35-50	1-8	1.50-1.70	0.20-2.00	0.14-0.18	Low	.17	.17		
To:										
Toledo----------	0-7	27-40	1.40-1.60	0.20-0.60	0.17-0.23	Moderate	.28	.28	5	6
	7-24	40-60	1.40-1.70	0.20-0.60	0.12-0.15	High	.28	.28		
	24-68	35-60	1.45-1.75	0.06-0.20	0.06-0.08	High	.28	.28		
Tt:										
Toledo----------	0-7	40-55	1.45-1.65	0.20-0.60	0.14-0.18	High	.28	.28	5	4
	7-24	40-60	1.40-1.70	0.20-0.60	0.12-0.15	High	.28	.28		
	24-68	35-60	1.45-1.75	0.06-0.20	0.06-0.08	High	.28	.28		
TuB2:										
Tuscola---------	0-7	8-20	1.30-1.65	0.60-2.00	0.14-0.18	Low	.32	.32	5	5
	7-27	18-35	1.30-1.70	0.60-2.00	0.17-0.20	Moderate	.32	.32		
	27-68	5-27	1.30-1.70	0.60-2.00	0.10-0.12	Low	.32	.32		

TABLE 29.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Shrink- swell potential	Erosion factors Kw	Kf	T	Wind erodi- bility group
	In	Pct	g/cc	In/hr	In/in					
TuC2:										
Tuscola---------	0-7	8-20	1.30-1.65	0.60-2.00	0.14-0.18	Low	.32	.32	5	5
	7-27	18-35	1.30-1.70	0.60-2.00	0.17-0.20	Low	.32	.32		
	27-68	5-27	1.30-1.70	0.60-2.00	0.10-0.12	Low	.32	.32		
Ud:										
Udorthents------	---	---	---	---	---	---	---	---	-	---
Ur:										
Urban land------	---	---	---	---	---	---	---	---	-	---
VaA:										
Vaughnsville----	0-9	15-27	1.30-1.50	0.60-2.00	0.14-0.18	Low	.32	.37	5	6
	9-30	27-45	1.40-1.60	0.60-2.00	0.10-0.15	Low	.32	.32		
	30-60	27-45	1.65-1.80	0.06-0.20	0.08-0.12	High	.32	.37		
W:										
Water-----------	---	---	---	---	---	---	---	---	-	---
Wa:										
Wabasha---------	0-16	40-45	1.35-1.55	0.20-0.60	0.18-0.22	Moderate	.32	.32	5	4
	16-48	40-55	1.35-1.65	0.06-0.20	0.15-0.18	High	.32	.32		
	48-70	35-55	1.50-1.65	0.06-0.20	0.08-0.10	High	.32	.32		
Wc:										
Warners---------	0-8	0-0	1.35-1.60	2.00-6.00	0.20-0.26	Low	.32	.32	3	2
	8-12	10-25	1.40-1.60	0.60-2.00	0.18-0.22	Low	.43	.43		
	12-31	17-27	1.20-1.40	0.06-0.20	0.16-0.20	Low	---	---		
	31-50	0-5	1.45-1.75	2.00-12.00	0.02-0.06	Low	.32	.32		
Wf:										
Wauseon---------	0-27	7-18	1.40-1.60	2.00-6.00	0.13-0.17	Low	.20	.20	4	3
	27-40	5-18	1.40-1.75	6.00-12.00	0.06-0.08	Low	.20	.20		
	40-60	40-55	1.50-1.75	0.06-0.20	0.06-0.08	High	.32	.32		
Wg:										
Wauseon---------	0-22	7-18	1.40-1.60	2.00-6.00	0.13-0.18	Low	.17	.17	4	2
	22-60	15-25	1.50-1.80	0.60-2.00	0.12-0.18	Moderate	.32	.37		

TABLE 30.--CHEMICAL PROPERTIES OF THE SOILS

(Absence of an entry indicates that data were not estimated. See text on page 206 for additional information.)

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
Ad:					
Adrian----------	0-22	6.1-7.3	55-75	125-200	0
	22-50	7.4-8.4	0.0-2.0	0.0-2.0	0-40
ArB:					
Arkport---------	0-24	5.6-6.5	0.5-2.0	8.0-20	0-1
	24-58	5.6-6.5	0.0-1.0	8.0-16	0-1
	58-75	7.4-8.4	0.0-1.0	2.0-8.0	0-5
ArC:					
Arkport---------	0-6	5.6-6.5	0.5-2.0	8.0-20	0-1
	6-55	5.6-6.5	0.0-1.0	8.0-16	0-1
	55-79	7.4-8.4	0.0-1.0	2.0-8.0	0-5
AsA:					
Aurand----------	0-10	5.6-7.3	2.0-6.0	8.0-23	0
	10-30	5.6-7.8	0.5-2.0	8.2-25	0-5
	30-38	6.6-7.8	0.0-1.0	6.0-23	0-5
	38-59	7.4-8.4	0.0-0.5	11-26	0-20
	59-80	7.4-8.4	0.0-0.5	11-26	15-30
AtA:					
Aurand----------	0-11	5.6-7.3	2.0-6.0	8.8-28	0
	11-29	5.6-7.8	0.5-2.0	8.2-25	0-5
	29-33	6.6-7.8	0.0-1.0	6.0-23	0-5
	33-48	7.4-8.4	0.0-0.5	11-26	0-20
	48-80	7.4-8.4	0.0-0.5	11-26	15-30
BcA:					
Bixler----------	0-10	5.6-7.3	0.5-3.0	3.0-15	0
	10-22	5.6-7.3	0.3-1.0	2.0-9.0	0
	22-25	5.6-7.3	0.1-0.5	2.0-13	0
	25-60	6.1-8.4	0.0-0.3	2.0-19	0-30
Ca:					
Clay pits-------	---	---	---	---	---
Ch:					
Cohoctah--------	0-44	6.6-7.8	3.0-15	10-30	---
	44-62	7.3-7.8	0.5-1.0	5.0-20	---
	62-71	7.3-7.8	---	1.0-10	---
Ck:					
Colwood---------	0-8	5.6-7.8	3.0-8.0	6.8-27	0
	8-38	6.1-7.8	0.5-1.0	8.2-23	0-5
	38-60	7.4-8.4	0.0-0.5	0.0-8.2	0-20
Cm:					
Colwood---------	0-8	5.6-7.8	3.0-8.0	8.8-32	0
	8-38	6.1-7.8	0.5-1.0	8.2-23	0-5
	38-60	7.4-8.4	0.0-0.5	0.0-8.2	0-20
Cn:					
Colwood---------	0-11	6.6-7.3	3.0-8.0	10-25	0
	11-48	6.6-7.3	0.5-1.0	3.0-15	0-5
	48-65	7.4-8.4	0.0-0.5	1.0-5.0	0-20

TABLE 30.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
Co:					
Colwood----------	0-11	6.6-7.3	3.0-8.0	10-25	0
	11-48	6.6-7.3	0.5-1.0	3.0-15	0-5
	48-65	7.4-8.4	0.0-0.5	1.0-5.0	0-20
Cu:					
Cut and fill land-----------	---	---	---	---	---
DeA:					
Del Rey---------	0-9	5.6-6.5	2.0-3.0	12-20	0
	9-34	5.1-7.8	0.0-1.0	18-24	0-10
	34-52	7.4-8.4	0.0-0.2	12-18	5-40
DfA:					
Del Rey---------	0-9	5.6-6.5	2.0-3.0	12-20	0
	9-34	5.1-7.8	0.0-1.0	18-24	0-10
	34-52	7.4-8.4	0.0-0.2	12-18	5-40
DuA:					
Digby-----------	0-9	6.1-6.5	1.0-3.0	5.0-15	0
	9-37	5.1-7.8	0.5-1.0	9.0-18	0-10
	37-50	7.4-8.4	0.1-0.3	3.0-10	5-40
DyA:					
Digby-----------	0-9	6.1-6.5	2.0-4.0	5.0-20	0
	9-37	5.1-7.8	0.5-1.0	9.0-18	0-10
	37-50	7.4-8.4	0.1-0.3	3.0-10	5-40
DzA:					
Digby-----------	0-9	5.6-7.3	2.0-4.0	5.0-20	0
	9-20	4.5-7.8	0.5-1.0	9.0-18	0
	20-35	6.1-7.8	0.2-0.5	9.0-18	0-5
	35-60	7.4-8.4	0.1-0.3	3.0-10	10-30
Ee:					
Eel-------------	0-8	6.1-7.3	1.0-3.0	9.2-22	0
	8-38	6.1-7.8	0.5-1.0	9.0-21	0-5
	38-60	6.6-8.4	0.5-1.0	4.2-17	0-20
FsA:					
Fulton----------	0-9	5.6-7.3	2.0-3.0	14-24	0
	9-32	5.6-7.3	0.5-1.0	22-36	0
	32-60	7.4-8.4	0.1-0.3	14-30	10-30
FsB:					
Fulton----------	0-9	5.6-7.3	2.0-3.0	14-24	0
	9-32	5.6-7.3	0.5-1.0	22-36	0
	32-60	7.4-8.4	0.1-0.3	14-30	10-30
FuA:					
Fulton----------	0-9	5.6-7.3	2.0-3.0	22-34	0
	9-32	5.6-7.3	0.5-1.0	22-36	0
	32-60	7.4-8.4	0.1-0.3	14-30	10-30
FuB:					
Fulton----------	0-9	5.6-7.3	2.0-3.0	22-34	0
	9-32	5.6-7.3	0.5-1.0	22-36	0
	32-60	7.4-8.4	0.1-0.3	14-30	10-30

TABLE 30.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
FvA:					
Fulton Variant--	0-9	5.6-7.3	2.0-4.0	11-22	0
	9-33	5.6-7.3	0.5-1.0	15-30	0
	33-57	7.4-8.4	0.2-0.5	4.0-10	5-10
	57-64	7.4-8.4	0.1-0.3	2.0-8.0	10-20
GaA:					
Galen-----------	0-28	5.1-6.5	2.0-4.0	1.0-5	---
	28-79	6.1-7.8	---	---	---
	79-92	6.6-7.8	---	---	---
GaB:					
Galen-----------	0-28	5.1-6.5	2.0-4.0	1.0-5	---
	28-79	6.1-7.8	---	---	---
	79-92	6.6-7.8	---	---	---
GbB:					
Galen-----------	0-10	5.1-7.3	2.0-4.0	2.0-10	0
	10-28	5.6-7.3	0.5-1.0	1.0-6.0	0
	28-58	5.6-7.3	0.0-0.5	1.0-4.0	0
	58-68	5.6-7.8	0.0-0.5	1.0-4.0	0-10
Gm:					
Genesee---------	0-20	6.6-7.8	1.0-3.0	9.0-23	---
	20-52	7.4-8.4	0.2-1.0	4.0-14	5-40
Go:					
Gilford---------	0-32	6.6-7.3	2.0-4.0	6.0-20	---
	32-60	7.4-8.4	0.0-0.5	1.0-6.0	0-30
Gr:					
Granby----------	0-20	5.6-7.3	4.0-6.0	5.0-20	0
	20-63	7.4-8.4	0.0-0.5	1.0-3.0	15-30
Gv:					
Gravel pits-----	---	---	---	---	---
HaA:					
Haney-----------	0-12	5.6-6.5	1.0-3.0	5.0-15	0
	12-28	5.1-7.3	0.5-1.0	10-18	0
	28-42	6.6-7.3	0.2-0.5	10-18	0-5
	42-80	7.4-8.4	0.1-0.3	3.0-10	5-30
HaB:					
Haney-----------	0-12	5.6-6.5	1.0-3.0	5.0-15	0
	12-28	5.1-7.3	0.5-1.0	10-18	0
	28-42	6.6-7.3	0.2-0.5	10-18	0-5
	42-80	7.4-8.4	0.1-0.3	3.0-10	5-30
HdA:					
Haney-----------	0-12	5.6-6.5	1.0-3.0	8.0-18	0
	12-28	5.1-7.3	0.5-1.0	10-18	0
	28-42	6.6-7.3	0.2-0.5	10-18	0-5
	42-80	7.4-8.4	0.1-0.3	3.0-10	5-30
HdB:					
Haney-----------	0-12	5.6-6.5	1.0-3.0	8.0-18	0
	12-28	5.1-7.3	0.5-1.0	10-18	0
	28-42	6.6-7.3	0.2-0.5	10-18	0-5
	42-80	7.4-8.4	0.1-0.3	3.0-10	5-30

TABLE 30.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
HeC:					
Haney-----------	0-12	5.6-6.5	1.0-3.0	8.0-18	0
	12-28	5.1-7.3	0.5-1.0	10-18	0
	28-42	6.6-7.3	0.2-0.5	10-18	0-5
	42-80	7.4-8.4	0.1-0.3	3.0-10	5-30
Rawson----------	0-12	5.6-7.3	1.0-3.0	8.0-16	0
	12-26	5.1-7.3	0.5-1.0	10-20	0
	26-60	7.4-8.4	0.1-0.5	17-27	5-25
HkA:					
Haskins---------	0-7	6.1-6.5	1.0-2.0	5.0-12	0
	7-24	6.1-6.5	0.0-0.5	7.0-21	0
	24-60	7.4-8.4	0.0-0.5	14-33	0-30
HlA:					
Haskins---------	0-7	6.1-6.5	1.0-3.0	6.0-15	0
	7-24	6.1-6.5	0.0-0.5	7.0-21	0
	24-60	7.4-8.4	0.0-0.5	14-33	0-30
HlB:					
Haskins---------	0-16	5.1-6.0	1.0-3.0	6.0-15	0
	16-30	5.6-6.5	0.0-0.5	7.0-21	0
	30-60	6.6-7.8	0.0-0.5	14-33	0-30
HnA:					
Haskins---------	0-7	6.1-6.5	1.0-2.0	5.0-12	---
	7-24	6.1-6.5	0.0-0.5	7.0-21	---
	24-40	7.4-8.4	0.0-0.5	14-33	0-30
	40-49	7.4-8.4	0.0-0.5	---	0-30
	49-55	7.4-8.4	0.0-0.5	---	0-30
	55-62	7.4-8.4	0.0-0.5	---	0-30
	62-64	7.4-8.4	0.0-0.5	---	0-30
Ho:					
Hoytville-------	0-7	6.1-7.3	3.0-6.0	24-35	0
	7-37	6.6-7.3	0.5-1.0	16-32	0-10
	37-60	7.4-8.4	0.5-1.0	14-30	15-30
Hp:					
Hoytville-------	0-9	6.1-7.3	3.0-6.0	17-35	0
	9-43	6.1-7.8	0.5-1.0	16-32	0-15
	43-58	7.4-8.4	0.5-1.0	14-30	15-30
	58-80	7.4-8.4	0.0-0.5	11-26	15-30
Hr:					
Hoytville-------	0-9	6.1-7.3	3.0-6.0	17-36	0
	9-52	6.1-8.4	0.5-1.0	17-35	0-15
	52-60	7.4-8.4	0.5-1.0	15-32	15-30
	60-80	7.4-8.4	0.0-0.5	11-26	15-30
Hs:					
Hoytville-------	0-8	6.1-7.3	3.0-6.0	22-41	0
	8-41	6.1-8.4	0.5-1.0	17-35	0-15
	41-60	7.4-8.4	0.5-1.0	15-32	15-30
	60-80	7.4-8.4	0.0-0.5	11-26	15-30
Hv:					
Hoytville-------	0-7	6.1-7.3	3.0-6.0	24-40	0
	7-37	6.6-7.3	0.5-1.0	16-32	0-15
	37-60	7.4-8.4	0.2-0.5	14-30	15-25

TABLE 30.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
Hw:					
Hoytville Variant--------	0-13	6.1-7.3	3.0-6.0	24-40	0-10
	13-44	7.4-8.4	0.2-0.5	14-30	15-25
KeA:					
Kibbie----------	0-16	5.6-7.3	0.5-3.0	2.0-15	0
	16-36	5.6-7.8	0.0-0.5	7.2-22	0-5
	36-60	7.4-8.4	0.0-0.5	0.8-12	10-35
KfA:					
Kibbie----------	0-15	6.1-6.5	2.0-3.0	5.0-20	0
	15-38	6.1-7.8	0.0-0.5	5.0-20	0-5
	38-72	7.4-8.4	0.0-0.5	1.0-10	10-35
KlA:					
Kibbie----------	0-12	6.1-6.5	2.0-3.0	5.0-20	0
	12-38	6.1-7.8	0.0-0.5	5.0-20	0-5
	38-71	7.4-8.4	0.0-0.5	1.0-10	10-35
La:					
Latty-----------	0-8	6.1-6.5	3.0-5.0	28-40	0
	8-41	6.6-7.8	0.5-1.0	20-38	0-5
	41-71	7.4-8.4	0.1-0.5	14-27	10-25
Lb:					
Latty-----------	0-9	6.1-7.8	3.0-5.0	28-40	0
	9-44	6.1-7.8	1.0-2.0	20-38	0-5
	44-60	7.4-8.4	0.0-0.5	14-27	15-30
Le:					
Lenawee---------	0-8	6.6-7.3	3.0-5.0	15-30	0
	8-43	6.6-7.8	0.5-2.0	10-25	---
	43-61	7.4-7.8	0.0-0.5	5.0-20	15-25
Lf:					
Lenawee---------	0-8	6.6-7.3	3.0-12	15-30	0
	8-43	6.6-7.8	0.5-2.0	10-25	---
	43-61	7.4-7.8	0.0-0.5	5.0-20	15-25
LwB2:					
Lucas-----------	0-5	5.1-6.0	1.0-3.0	16-30	---
	5-25	6.1-7.3	0.3-1.0	18-32	---
	25-60	7.4-8.4	0.1-0.3	16-30	10-30
LwC2:					
Lucas-----------	0-5	5.1-6.0	1.0-3.0	16-30	---
	5-25	6.1-7.3	0.3-1.0	18-32	---
	25-60	7.4-8.4	0.1-0.3	16-30	10-30
LxC3:					
Lucas-----------	0-5	5.1-6.0	0.2-2.0	18-34	---
	5-25	6.1-7.3	0.3-1.0	18-32	---
	25-60	7.4-8.4	0.1-0.3	16-30	10-30
LxE3:					
Lucas-----------	0-5	5.1-6.0	0.5-2.0	18-34	---
	5-25	6.1-7.3	0.3-1.0	18-32	---
	25-60	7.4-8.4	0.1-0.3	16-30	10-30

TABLE 30.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
Mb:					
Mermill----------	0-9	5.6-7.3	3.0-6.0	12-28	0
	9-35	5.6-7.3	0.5-1.0	8.2-23	0
	35-46	6.6-8.4	0.0-0.5	11-26	0-30
	46-80	7.4-8.4	0.0-0.5	11-26	15-30
Aurand-----------	0-11	5.6-7.3	2.0-6.0	8.8-28	0
	11-23	5.6-7.8	0.5-2.0	8.2-25	0-5
	23-29	6.6-7.8	0.0-1.0	6.0-23	0-5
	29-51	7.4-8.4	0.0-0.5	11-26	0-20
	51-80	7.4-8.4	0.0-0.5	11-26	15-30
Mc:					
Mermill----------	0-9	6.1-6.5	3.0-6.0	19-28	0
	9-20	6.1-7.3	0.5-1.0	7.0-21	0-5
	20-34	6.6-7.8	0.5-1.0	7.0-21	0
	34-60	7.4-8.4	0.1-0.5	14-33	10-25
Md:					
Medway-----------	0-18	6.6-7.3	3.0-6.0	13-28	---
	18-60	6.6-7.8	0.5-1.0	7.0-17	---
Me:					
Mermill----------	0-9	6.1-6.5	3.0-6.0	13-26	0
	9-40	6.6-7.3	0.5-1.0	7.0-21	0
	40-60	7.4-8.4	0.2-0.5	14-33	0-30
Mf:					
Mermill----------	0-9	6.1-6.5	3.0-6.0	19-28	0
	9-40	6.6-7.3	0.5-1.0	7.0-21	0
	40-60	7.4-8.4	0.1-0.5	14-33	0-30
Mg:					
Mermill----------	0-9	6.1-6.5	3.0-6.0	13-26	0
	9-40	6.6-7.3	0.5-1.0	7.0-21	0
	40-66	7.4-8.4	0.2-0.5	14-33	0-30
Mh:					
Millgrove--------	0-12	6.1-6.5	3.0-8.0	15-30	0
	12-42	5.6-7.3	0.5-1.0	10-18	0
	42-72	7.4-8.4	0.5-1.0	3.0-10	10-25
Mk:					
Millgrove--------	0-12	6.1-6.5	3.0-8.0	20-32	0
	12-42	5.6-7.3	0.5-1.0	10-18	0
	42-72	7.4-8.4	0.5-1.0	3.0-10	10-25
NaA:					
Nappanee---------	0-12	5.6-6.5	1.0-3.0	10-15	0
	12-24	5.1-7.8	0.0-1.0	8.0-17	---
	24-60	7.4-8.4	0.0-0.5	5.0-12	10-20
NaB:					
Nappanee---------	0-12	5.6-6.5	1.0-3.0	10-15	0
	12-24	5.1-7.3	0.0-1.0	8.0-17	---
	24-60	7.4-8.4	0.0-0.5	5.0-12	10-20
NtA:					
Nappanee---------	0-12	5.6-6.5	1.0-3.0	10-15	0
	12-24	5.1-7.3	0.0-1.0	8.0-17	---
	24-60	7.4-8.4	0.0-0.5	5.0-12	10-20

TABLE 30.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
NtB:					
Nappanee--------	0-12	5.6-6.5	1.0-3.0	10-15	0
	12-24	5.1-7.3	0.0-1.0	8.0-17	---
	24-60	7.4-8.4	0.0-0.5	5.0-12	10-20
NtB2:					
Nappanee--------	0-12	5.6-6.5	1.0-3.0	10-15	0
	12-24	5.1-7.3	0.0-1.0	8.0-17	---
	24-60	7.4-8.4	0.0-0.5	5.0-12	10-20
OaC:					
Oakville--------	0-9	5.1-6.0	0.5-2.0	1.0-2.0	---
	9-100	5.6-7.3	0.0-0.5	1.0-2.0	---
ObB:					
Oakville--------	0-6	5.6-7.3	0.5-2.0	1.0-2.0	0
	6-18	5.6-7.3	0.0-0.5	1.0-2.0	0
	18-80	5.6-7.3	0.0-0.5	1.0-2.0	0
ObC:					
Oakville--------	0-9	5.1-7.3	0.5-2.0	1.0-2.0	0
	9-39	5.1-7.3	0.0-0.5	1.0-2.0	0
	39-60	5.6-7.3	0.0-0.5	1.0-2.0	0
OsB:					
Oshtemo---------	0-29	5.1-6.0	0.5-3.0	2.0-12	---
	29-44	5.1-7.3	---	2.0-9.0	---
	44-70	7.4-8.4	---	0.0-9.0	10-25
OtB:					
Ottokee---------	0-47	5.0-6.5	0.5-2.0	2.0-9.0	0
	47-49	5.6-7.3	0.3-1.0	1.0-6.0	0
	49-81	6.6-7.8	0.1-0.3	1.0-4.0	0-12
OuB:					
Ottokee---------	0-8	6.1-7.3	0.5-2.0	2.0-9.0	0
	8-60	5.6-7.3	0.5-1.0	1.0-6.0	0
	60-78	6.1-8.4	0.0-0.5	1.0-4.0	0-10
OzB:					
Ottokee---------	0-11	5.6-7.3	0.5-2.0	1.8-10	0
	11-47	5.6-7.3	0.0-1.0	0.4-9.2	0
	47-60	6.1-8.4	0.0-0.5	0.4-5.8	0-12
Spinks----------	0-7	5.1-7.3	0.5-2.0	1.8-13	0
	7-48	5.1-7.3	0.0-0.5	0.0-10	0
	48-60	5.1-7.8	0.0-0.5	1.2-10	0
Pa:					
Paulding--------	0-8	5.1-6.5	3.0-5.0	30-50	0
	8-50	6.6-7.8	0.5-1.0	30-48	0-3
	50-60	7.4-8.4	0.1-0.5	24-45	8-25
Pt:					
Pits, quarry----	---	---	---	---	---
RaB:					
Rawson----------	0-12	5.6-7.3	0.5-3.0	5.0-15	0
	12-26	5.1-7.3	0.5-1.0	10-20	0
	26-60	7.4-8.4	0.1-0.5	17-27	5-25

TABLE 30.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
RdB:					
Rawson----------	0-12	5.6-7.3	1.0-3.0	8.0-16	0
	12-26	5.1-7.3	0.5-1.0	10-20	0
	26-60	7.4-8.4	0.1-0.5	17-27	5-25
ReB:					
Rawson----------	0-10	5.6-7.3	1.0-3.0	8.0-16	0
	10-35	5.1-7.3	0.5-1.0	10-20	0
	35-60	7.4-8.4	0.1-0.5	17-27	5-25
RfA:					
Rimer-----------	0-24	5.1-7.3	1.0-3.0	3.0-15	---
	24-70	7.4-8.4	0.1-0.3	14-33	10-30
RgA:					
Rimer-----------	0-9	5.1-7.3	1.0-3.0	3.0-15	0
	9-23	5.1-7.3	0.3-1.0	2.0-9.0	0
	23-29	5.1-7.3	0.2-0.5	3.0-11	0
	29-60	6.1-8.4	0.1-0.3	14-33	10-30
RhB:					
Rimer-----------	0-8	5.1-7.3	1.0-3.0	3.2-15	0
	8-25	5.1-7.3	0.5-1.0	3.0-11	0
	25-27	5.1-7.3	0.0-0.5	2.8-12	0
	27-32	6.1-7.8	0.0-0.5	12-28	0-15
	32-60	7.4-8.4	0.0-0.5	11-26	10-30
Tedrow----------	0-14	6.1-7.3	1.0-3.0	2.8-12	0
	14-34	5.6-8.4	0.0-0.5	0.8-5.8	0-5
	34-60	7.4-8.4	0.0-0.5	11-26	10-30
RmA:					
Rimer-----------	0-29	5.1-7.3	1.0-3.0	4.0-15	---
	29-64	7.4-8.4	0.1-0.3	8.0-27	10-30
RoA:					
Roselms---------	0-6	5.1-6.0	2.0-3.0	17-26	0
	6-25	5.1-7.3	0.5-1.0	25-50	0-10
	25-60	7.4-8.4	0.1-0.5	24-40	14-25
RrA:					
Roselms---------	0-8	4.5-7.3	2.0-3.0	20-32	0-10
	8-32	4.5-7.8	0.5-1.0	24-40	14-25
	32-60	7.4-8.4	0.1-0.5	24-40	---
Rs:					
Ross------------	0-21	6.6-7.3	3.0-5.0	12-26	0
	21-61	6.6-7.8	1.0-3.0	8.0-20	0-20
SaE3:					
St. Clair-------	0-3	5.6-7.3	1.0-3.0	5.0-25	---
	3-22	5.6-7.3	0.0-0.5	5.0-20	---
	22-60	7.4-8.4	0.0-0.5	5.0-20	20-30
SbB2:					
St. Clair-------	0-5	5.6-6.5	1.0-3.0	5.0-25	---
	5-23	6.1-6.8	0.0-0.5	5.0-20	---
	23-60	7.4-8.4	0.0-0.5	5.0-20	20-30

TABLE 30.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
SbC2:					
St. Clair-------	0-5	5.6-6.5	1.0-3.0	5.0-25	---
	5-23	6.1-7.3	0.0-0.5	5.0-20	---
	23-60	7.4-8.4	0.0-0.5	5.0-20	20-30
SbD2:					
St. Clair-------	0-8	5.6-7.3	0.5-2.0	12-28	0
	8-18	5.6-7.3	0.0-0.5	16-37	0
	18-42	7.4-8.4	0.0-0.5	14-34	15-30
	42-60	7.4-8.4	0.0-0.5	11-26	15-30
SbE2:					
St. Clair-------	0-8	5.6-7.3	0.5-2.0	12-28	0
	8-18	5.6-7.3	0.0-0.5	16-37	0
	18-42	7.4-8.4	0.0-0.5	14-34	15-30
	42-60	7.4-8.4	0.0-0.5	11-26	15-30
ScC3:					
St. Clair-------	0-5	5.6-6.5	0.5-1.0	5.0-25	---
	5-23	6.1-7.3	0.0-0.5	5.0-20	---
	23-60	7.4-8.4	0.0-0.5	5.0-20	20-30
ScD3:					
St. Clair-------	0-5	5.6-6.5	0.5-1.0	5.0-25	---
	5-23	6.1-7.3	0.0-0.5	5.0-20	---
	23-60	7.4-8.4	0.0-0.5	5.0-20	20-30
ScE3:					
St. Clair-------	0-5	5.6-6.5	0.5-1.0	5.0-25	---
	5-23	6.1-7.3	0.0-0.5	5.0-20	---
	23-60	7.4-8.4	0.0-0.5	5.0-20	20-30
ScF3:					
St. Clair-------	0-5	5.6-6.5	0.5-1.0	5.0-25	---
	5-25	6.1-7.3	0.0-0.5	5.0-20	---
	25-60	7.4-8.4	0.0-0.5	5.0-20	20-30
SdB:					
Seward----------	0-26	5.6-7.3	0.5-3.0	2.0-15	0
	26-34	6.1-7.3	0.2-0.5	2.0-11	0
	34-60	7.4-8.4	0.1-0.3	14-33	10-30
SdC:					
Seward----------	0-26	5.6-7.3	0.5-3.0	2.0-15	0
	26-34	6.1-7.3	0.2-0.5	2.0-11	0
	34-60	7.4-8.4	0.1-0.3	14-33	10-30
SdD:					
Seward----------	0-26	5.6-7.3	0.5-3.0	2.0-15	0
	26-34	6.1-7.3	0.2-0.5	2.0-11	0
	34-60	7.4-8.4	0.1-0.3	14-33	10-30
SeB:					
Seward----------	0-27	5.6-7.3	0.5-3.0	2.0-15	0
	27-94	7.4-7.8	0.2-0.5	2.0-11	10-30
SeC:					
Seward----------	0-27	5.6-7.3	0.5-3.0	2.0-15	0
	27-94	7.4-7.8	0.2-0.5	2.0-11	10-30

TABLE 30.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
SfA:					
Shinrock Variant	0-9	5.1-6.5	1.0-3.0	8.0-18	---
	9-28	5.1-6.0	0.5-1.0	4.0-20	---
	28-37	5.1-6.0	0.0-0.5	4.0-20	---
	37-82	6.1-7.3	0.0-0.5	3.0-28	---
Sh:					
Shoals----------	0-3	6.6-7.8	2.0-5.0	12-27	0-5
	3-31	6.6-7.8	0.5-2.0	8.0-24	0-10
	31-60	7.4-8.4	0.5-1.0	3.0-19	0-25
Sm:					
Sloan-----------	0-10	6.1-7.8	3.0-6.0	17-33	0-5
	10-26	6.1-8.4	0.5-1.0	9.8-23	0-20
	26-60	6.6-8.4	0.0-0.5	4.0-19	0-40
Sn:					
Sloan-----------	0-12	6.1-7.8	3.0-6.0	13-26	0
	12-36	6.1-8.4	0.5-1.0	10-20	0-20
	36-67	6.6-8.4	0.0-0.5	4.0-18	0-40
So:					
Sloan-----------	0-12	6.6-7.8	3.0-6.0	19-29	0-5
	12-43	6.6-8.4	0.5-1.0	10-20	0-20
	43-72	7.4-8.4	0.1-0.5	4.0-18	5-40
SpB:					
Spinks----------	0-23	5.6-6.5	2.0-4.0	2.0-5.0	0
	23-100	6.1-6.5	0.0-0.5	1.0-6.0	0
	100-153	7.4-8.4	0.0-0.5	0.0-2.0	0-10
SpC:					
Spinks----------	0-23	5.6-6.5	2.0-4.0	2.0-5.0	0
	23-100	6.1-6.5	0.0-0.5	1.0-6.0	0
	100-153	7.4-8.4	0.0-0.6	0.0-2.0	0-10
SpD:					
Spinks----------	0-23	5.6-6.5	2.0-4.0	2.0-5.0	0
	23-100	6.1-6.5	0.0-0.5	1.0-6.0	0
	100-153	7.4-8.4	0.0-0.5	0.0-2.0	0-10
TdA:					
Tedrow----------	0-8	6.1-7.3	1.0-3.0	5.0-14	0
	8-31	6.6-7.3	0.1-0.5	2.0-6.0	0
	31-60	7.4-8.4	0.1-0.3	1.0-4.0	0-10
TeA:					
Tedrow Variant--	0-9	6.1-7.3	1.0-3.0	5.0-14	0
	9-35	6.6-7.3	0.1-0.5	2.0-6.0	0
	35-50	7.4-8.4	0.1-0.3	1.0-4.0	0-10
To:					
Toledo----------	0-7	6.6-7.3	3.0-6.0	22-36	0
	7-24	6.6-7.8	0.5-1.0	16-36	0-5
	24-68	7.4-8.4	0.1-0.5	14-32	8-22
Tt:					
Toledo----------	0-7	6.6-7.3	3.0-6.0	26-40	0
	7-24	6.6-7.8	0.5-1.0	16-36	0-5
	24-68	7.4-8.4	0.0-0.5	14-32	8-22

TABLE 30.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
TuB2:					
Tuscola---------	0-7	5.6-6.5	1.0-2.0	4.0-15	0
	7-27	5.6-6.5	0.0-0.5	3.0-15	0
	27-68	7.4-8.4	0.0-0.5	1.0-20	0-25
TuC2:					
Tuscola---------	0-7	5.6-6.5	1.0-2.0	4.0-15	0
	7-27	5.6-6.5	0.0-0.5	3.0-15	0
	27-68	7.4-8.4	0.0-0.5	1.0-20	0-25
Ud:					
Udorthents------	---	---	---	---	---
Ur:					
Urban land------	---	---	---	---	---
VaA:					
Vaughnsville----	0-9	6.6-7.3	1.0-3.0	10-22	---
	9-30	6.6-7.3	0.5-1.0	16-27	---
	30-60	7.4-8.4	0.1-0.3	16-27	---
W:					
Water-----------	---	---	---	---	---
Wa:					
Wabasha---------	0-16	7.4-7.8	3.0-6.0	22-39	0
	16-48	7.4-7.8	0.5-1.0	16-33	0-5
	48-70	7.4-8.4	0.1-0.5	14-33	0-15
Wc:					
Warners---------	0-8	6.6-7.3	10-15	24-45	0-15
	8-12	7.4-8.4	---	---	---
	12-31	7.4-8.4	2.0-5.0	10-29	10-60
	31-50	7.4-8.4	0.1-0.5	14-36	10-30
Wf:					
Wauseon---------	0-27	6.1-7.3	4.0-8.0	11-22	---
	27-40	6.6-7.8	0.5-2.0	2.0-11	0-5
	40-60	7.4-8.4	0.1-0.5	14-33	15-25
Wg:					
Wauseon---------	0-22	6.1-7.3	4.0-8.0	11-22	---
	22-60	7.4-8.4	0.1-0.5	6.0-15	15-25

TABLE 31.--WATER FEATURES

(Depths of layers are in feet. See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated. See text on page 207 for additional information.)

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
Ad:										
Adrian----------	A/D	Jan-May	0.0-1.0	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun-Oct	---	---	---	---	---	None	---	None
		Nov-Dec	0.0-1.0	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
ArB:										
Arkport---------	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
ArC:										
Arkport---------	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
AsA:										
Aurand----------	C	Jan-May	0.5-1.5	3.3-5.0	Perched	---	---	None	---	None
		Jun-Nov	---	---	---	---	---	None	---	None
		Dec	0.5-1.5	3.3-5.0	Perched	---	---	None	---	None
AtA:										
Aurand----------	C	Jan-May	0.5-1.5	3.3-5.0	Perched	---	---	None	---	None
		Jun-Nov	---	---	---	---	---	None	---	None
		Dec	0.5-1.5	3.3-5.0	Perched	---	---	None	---	None
BcA:										
Bixler----------	C	Jan-May	2.0-3.5	>6.0	Apparent	---	---	None	---	None
		Jun-Oct	---	---	---	---	---	None	---	None
		Nov-Dec	2.0-3.5	>6.0	Apparent	---	---	None	---	None
Ca:										
Clay pits-------	---	Jan-Dec	---	---	---	---	---	---	---	None
Ch:										
Cohoctah--------	B/D	Jan-May	0.0-0.5	>6.0	Apparent	---	---	None	Long	Occasional
		Jun-Aug	---	---	---	---	---	None	---	None
		Sep-Dec	0.0-0.5	>6.0	Apparent	---	---	None	Long	Occasional
Ck:										
Colwood---------	B	Jan-May	0.0-1.0	>5.0	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun-Sep	---	---	---	---	---	None	---	None
		Oct-Dec	0.0-1.0	>5.0	Apparent	0.0-1.0	Long	Frequent	---	None
Cm:										
Colwood---------	B	Jan-May	0.0-1.0	>5.0	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun-Sep	---	---	---	---	---	None	---	None
		Oct-Dec	0.0-1.0	>5.0	Apparent	0.0-1.0	Long	Frequent	---	None
Cn:										
Colwood---------	B/D	Jan-May	0.0-0.5	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun-Sep	---	---	---	---	---	None	---	None
		Oct-Dec	0.0-0.5	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
Co:										
Colwood---------	B/D	Jan-May	0.0-0.5	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun-Sep	---	---	---	---	---	None	---	None
		Oct-Dec	0.0-0.5	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
Cu:										
Cut and fill land-----------	---	Jan-Dec	---	---	---	---	---	---	---	None
DeA:										
Del Rey---------	C	Jan-May	0.5-1.5	>6.0	Apparent	---	---	None	---	None
		Jun-Dec	---	---	---	---	---	None	---	None
DfA:										
Del Rey---------	C	Jan-May	0.5-1.5	>6.0	Apparent	---	---	None	---	None
		Jun-Dec	---	---	---	---	---	None	---	None
DuA:										
Digby-----------	B	Jan-Apr	0.5-1.5	>6.0	Apparent	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None

Table 31.--Water Features Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
DyA:										
Digby-----------	B	Jan-Apr	0.5-1.5	>6.0	Apparent	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
DzA:										
Digby-----------	B	Jan-Apr	1.0-2.5	>6.0	Apparent	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
Ee:										
Eel-------------	B	Jan-Apr	1.5-2.0	>5.0	Apparent	---	---	None	Brief	Frequent
		May-Jun	---	---	---	---	---	None	Brief	Frequent
		Jul-Sep	---	---	---	---	---	None	---	None
		Oct-Dec	---	---	---	---	---	None	Brief	Frequent
FsA:										
Fulton----------	D	Jan-May	0.5-1.5	2.0-4.0	Perched	---	---	None	---	None
		Jun-Nov	---	---	---	---	---	None	---	None
		Dec	0.5-1.5	2.0-4.0	Perched	---	---	None	---	None
FsB:										
Fulton----------	D	Jan-May	0.5-1.5	2.0-4.0	Perched	---	---	None	---	None
		Jun-Nov	---	---	---	---	---	None	---	None
		Dec	0.5-1.5	2.0-4.0	Perched	---	---	None	---	None
FuA:										
Fulton----------	D	Jan-May	0.5-1.5	2.0-4.0	Perched	---	---	None	---	None
		Jun-Nov	---	---	---	---	---	None	---	None
		Dec	0.5-1.5	2.0-4.0	Perched	---	---	None	---	None
FuB:										
Fulton----------	D	Jan-May	0.5-1.5	2.0-4.0	Perched	---	---	None	---	None
		Jun-Nov	---	---	---	---	---	None	---	None
		Dec	0.5-1.5	2.0-4.0	Perched	---	---	None	---	None
FvA:										
Fulton Variant--	C	Jan-Apr	0.5-1.5	>6.0	Apparent	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
GaA:										
Galen-----------	B	Jan-Feb	---	---	---	---	---	None	---	None
		Mar-May	2.0-3.0	>6.0	Apparent	---	---	None	---	None
		Jun-Dec	---	---	---	---	---	None	---	None
GaB:										
Galen-----------	B	Jan-Feb	---	---	---	---	---	None	---	None
		Mar-May	2.0-3.0	>6.0	Apparent	---	---	None	---	None
		Jun-Dec	---	---	---	---	---	None	---	None
GbB:										
Galen-----------	B	Jan-Feb	---	---	---	---	---	None	---	None
		Mar-May	1.5-2.0	>6.0	Apparent	---	---	None	---	None
		Jun-Dec	---	---	---	---	---	None	---	None
Gm:										
Genesee---------	B	Jan-Jun	>3.0	>3.0	---	---	---	None	Brief	Occasional
		Jul-Sep	---	---	---	---	---	None	---	None
		Oct-Dec	>3.0	>3.0	---	---	---	None	Brief	Occasional
Go:										
Gilford---------	B/D	Jan-May	0.0-0.5	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Jun-Nov	---	---	---	---	---	None	---	None
		Dec	0.0-0.5	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
Gr:										
Granby----------	A/D	Jan-Jun	0.0-1.0	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
		Jul-Oct	---	---	---	---	---	None	---	None
		Nov-Dec	0.0-1.0	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None

Table 31.--Water Features Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
Gv:										
Gravel pits	---	Jan-Dec	---	---	---	---	---	---	---	None
HaA:										
Haney	B	Jan-Apr	1.5-2.0	>6.0	Apparent	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
HaB:										
Haney	B	Jan-Apr	1.5-2.0	>6.0	Apparent	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
HdA:										
Haney	B	Jan-Apr	1.5-2.0	>6.0	Apparent	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
HdB:										
Haney	B	Jan-Apr	1.5-2.0	>6.0	Apparent	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
HeC:										
Haney	B	Jan-Apr	1.5-2.0	>6.0	Apparent	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
Rawson	B	Jan-Apr	2.0-3.0	2.5-5.0	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
HkA:										
Haskins	C	Jan-Apr	0.5-1.0	2.5-5.0	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
HlA:										
Haskins	C	Jan-Apr	0.5-1.0	2.5-5.0	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
HlB:										
Haskins	C	Jan-Apr	0.5-1.5	2.5-5.0	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
HnA:										
Haskins	C	Jan-Apr	0.5-1.0	2.5-5.0	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
Ho:										
Hoytville	C/D	Jan-Apr	0.0-1.0	3.0-5.0	Perched	0.0-1.0	Long	Frequent	---	None
		May-Dec	---	---	---	---	---	None	---	None
Hp:										
Hoytville	C	Jan-Apr	0.0-1.0	4.0-5.5	Perched	0.0-1.0	Brief	Frequent	---	None
		May-Dec	---	---	---	---	---	None	---	None
Hr:										
Hoytville	C	Jan-Apr	0.0-1.0	3.3-5.4	Perched	0.0-1.0	Brief	Frequent	---	None
		May-Dec	---	---	---	---	---	None	---	None
Hs:										
Hoytville	C	Jan-Apr	0.0-1.0	3.3-5.4	Perched	0.0-1.0	Brief	Frequent	---	None
		May-Dec	---	---	---	---	---	None	---	None
Hv:										
Hoytville	C/D	Jan-Apr	0.0-1.0	3.0-5.0	Perched	0.0-1.0	Long	Frequent	---	None
		May-Dec	---	---	---	---	---	None	---	None
Hw:										
Hoytville Variant	D	Jan-Apr	0.0-1.0	2.0-4.0	Perched	0.0-1.0	Long	Frequent	---	None
		May-Dec	---	---	---	---	---	None	---	None
KeA:										
Kibbie	B	Jan-May	0.5-1.5	>5.0	Apparent	---	---	None	---	None
		Jun-Oct	---	---	---	---	---	None	---	None
		Nov-Dec	0.5-1.5	>5.0	Apparent	---	---	None	---	None

Table 31.--Water Features Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
KfA:										
Kibbie----------	B	Jan-May	0.5-1.0	>6.0	Apparent	---	---	None	---	None
		Jun-Oct	---	---	---	---	---	None	---	None
		Nov-Dec	0.5-1.0	>6.0	Apparent	---	---	None	---	None
KlA:										
Kibbie----------	B	Jan-May	0.5-1.0	>6.0	Apparent	---	---	None	---	None
		Jun-Oct	---	---	---	---	---	None	---	None
		Nov-Dec	0.5-1.0	>6.0	Apparent	---	---	None	---	None
La:										
Latty-----------	D	Jan-Apr	0.0-1.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		May-Dec	---	---	---	---	---	None	---	None
Lb:										
Latty-----------	D	Jan-Apr	0.0-1.0	2.8-4.6	Perched	0.0-0.5	Long	Frequent	---	None
		May-Dec	---	---	---	---	---	None	---	None
Le:										
Lenawee---------	B/D	Jan-May	0.0-1.0	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun-Oct	---	---	---	---	---	None	---	None
		Nov-Dec	0.0-1.0	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
Lf:										
Lenawee---------	B/D	Jan-May	0.0-1.0	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun-Oct	---	---	---	---	---	None	---	None
		Nov-Dec	0.0-1.0	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
LwB2:										
Lucas-----------	D	Jan-Apr	2.0-3.0	2.5-4.0	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
LwC2:										
Lucas-----------	D	Jan-Apr	2.0-3.0	2.5-4.0	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
LxC3:										
Lucas-----------	D	Jan-Apr	2.0-3.0	2.5-4.0	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
LxE3:										
Lucas-----------	D	Jan-Apr	2.0-3.0	2.5-4.0	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
Mb:										
Mermill---------	B	Jan-May	0.0-1.0	2.0-5.0	Perched	0.0-1.0	Brief	Occasional	---	None
		Jun-Nov	---	---	---	---	---	None	---	None
		Dec	0.0-1.0	2.0-5.0	Perched	0.0-1.0	Brief	Occasional	---	None
Aurand----------	C	Jan-May	0.5-1.5	3.3-5.0	Perched	---	---	None	---	None
		Jun-Nov	---	---	---	---	---	None	---	None
		Dec	0.5-1.5	3.3-5.0	Perched	---	---	None	---	None
Mc:										
Mermill---------	B/D	Jan-May	0.0-0.5	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun-Nov	---	---	---	---	---	None	---	None
		Dec	0.0-0.5	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
Md:										
Medway----------	B	Jan-Apr	2.0-3.0	>6.0	Apparent	---	---	None	Long	Occasional
		May-Jun	---	---	---	---	---	None	Long	Occasional
		Jul-Oct	---	---	---	---	---	None	---	None
		Nov-Dec	---	---	---	---	---	None	Long	Occasional
Me:										
Mermill---------	B/D	Jan-May	0.0-1.0	3.0-5.0	Perched	0.0-1.0	Long	Frequent	---	None
		Jun-Nov	---	---	---	---	---	None	---	None
		Dec	0.0-1.0	3.0-5.0	Perched	0.0-1.0	Long	Frequent	---	None
Mf:										
Mermill---------	B/D	Jan-May	0.0-1.0	3.0-5.0	Perched	0.0-1.0	Long	Frequent	---	None
		Jun-Nov	---	---	---	---	---	None	---	None
		Dec	0.0-1.0	3.0-5.0	Perched	0.0-1.0	Long	Frequent	---	None

Table 31.--Water Features Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
Mg:										
Mermill	B/D	Jan-May	0.0-1.0	3.0-5.0	Perched	0.0-1.0	Long	Frequent	---	None
		Jun-Nov	---	---	---	---	---	None	---	None
		Dec	0.0-1.0	3.0-5.0	Perched	0.0-1.0	Long	Frequent	---	None
Mh:										
Millgrove	B/D	Jan-May	0.0-1.0	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun-Oct	---	---	---	---	---	None	---	None
		Nov-Dec	0.0-1.0	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
Mk:										
Millgrove	B/D	Jan-May	0.0-1.0	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun-Oct	---	---	---	---	---	None	---	None
		Nov-Dec	0.0-1.0	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
NaA:										
Nappanee	D	Jan-May	0.5-1.0	1.0-5.0	Perched	---	---	None	---	None
		Jun-Oct	---	---	---	---	---	None	---	None
		Nov-Dec	0.5-1.0	1.0-5.0	Perched	---	---	None	---	None
NaB:										
Nappanee	D	Jan-May	0.5-1.0	1.0-5.0	Perched	---	---	None	---	None
		Jun-Oct	---	---	---	---	---	None	---	None
		Nov-Dec	0.5-1.0	1.0-5.0	Perched	---	---	None	---	None
NtA:										
Nappanee	D	Jan-May	0.5-1.0	1.0-5.0	Perched	---	---	None	---	None
		Jun-Oct	---	---	---	---	---	None	---	None
		Nov-Dec	0.5-1.0	1.0-5.0	Perched	---	---	None	---	None
NtB:										
Nappanee	D	Jan-May	0.5-1.0	1.0-5.0	Perched	---	---	None	---	None
		Jun-Oct	---	---	---	---	---	None	---	None
		Nov-Dec	0.5-1.0	1.0-5.0	Perched	---	---	None	---	None
NtB2:										
Nappanee	D	Jan-May	0.5-1.0	1.0-5.0	Perched	---	---	None	---	None
		Jun-Oct	---	---	---	---	---	None	---	None
		Nov-Dec	0.5-1.0	1.0-5.0	Perched	---	---	None	---	None
OaC:										
Oakville	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
ObB:										
Oakville	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
ObC:										
Oakville	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
OsB:										
Oshtemo	B	Jan-Dec	>4.0	>4.0	---	---	---	None	---	None
OtB:										
Ottokee	A	Jan-Apr	2.5-3.0	>6.0	Apparent	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
OuB:										
Ottokee	A	Jan-Apr	2.0-3.5	>6.0	Apparent	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
OzB:										
Ottokee	A	Jan-Apr	1.5-3.5	>5.0	Apparent	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
Spinks	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Pa:										
Paulding	D	Jan-Apr	0	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
		May-Dec	---	---	---	---	---	None	---	None
Pt:										
Pits, quarry	---	Jan-Dec	---	---	---	---	---	None	---	None

Table 31.--Water Features Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
RaB:										
Rawson----------	B	Jan-Apr	2.0-3.0	2.5-5.0	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
RdB:										
Rawson----------	B	Jan-Apr	2.0-3.0	2.5-5.0	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
ReB:										
Rawson----------	B	Jan-Apr	2.0-3.0	2.5-5.0	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
RfA:										
Rimer-----------	C	Jan-Apr	0.0-0.5	2.5-5.0	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
RgA:										
Rimer-----------	C	Jan-Apr	1.0-2.5	2.5-3.7	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
RhB:										
Rimer-----------	C	Jan-Apr	0.5-1.5	2.1-4.6	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
Tedrow----------	C	Jan-Apr	0.5-1.5	2.5-4.0	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
RmA:										
Rimer-----------	C	Jan-Apr	0.0-0.5	2.5-5.0	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
RoA:										
Roselms---------	D	Jan-Apr	0.0-0.5	2.5-5.0	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
RrA:										
Roselms---------	D	Jan-Apr	0.5-1.5	2.5-5.0	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
Rs:										
Ross------------	B	Jan	---	---	---	---	---	None	Brief	Occasional
		Feb-Apr	>3.0	>6.0	Apparent	---	---	None	Brief	Occasional
		May-Jun	---	---	---	---	---	None	Brief	Occasional
		Jul-Oct	---	---	---	---	---	None	---	None
		Nov-Dec	---	---	---	---	---	None	Brief	Occasional
SaE3:										
St. Clair-------	D	Jan-Feb	---	---	---	---	---	None	---	None
		Mar-May	2.0-3.0	2.5-5.0	Perched	---	---	None	---	None
		Jun-Dec	---	---	---	---	---	None	---	None
SbB2:										
St. Clair-------	D	Jan-Feb	---	---	---	---	---	None	---	None
		Mar-May	1.5-2.0	2.0-5.0	Perched	---	---	None	---	None
		Jun-Dec	---	---	---	---	---	None	---	None
SbC2:										
St. Clair-------	D	Jan-Feb	---	---	---	---	---	None	---	None
		Mar-May	1.5-2.0	2.0-5.0	Perched	---	---	None	---	None
		Jun-Dec	---	---	---	---	---	None	---	None
SbD2:										
St. Clair-------	D	Jan-Feb	---	---	---	---	---	None	---	None
		Mar-May	1.5-3.0	1.7-4.0	Perched	---	---	None	---	None
		Jun-Dec	---	---	---	---	---	None	---	None
SbE2:										
St. Clair-------	D	Jan-Feb	---	---	---	---	---	None	---	None
		Mar-May	1.5-3.0	1.7-4.0	Perched	---	---	None	---	None
		Jun-Dec	---	---	---	---	---	None	---	None

Table 31.--Water Features Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
ScC3:										
St. Clair-------	D	Jan-Feb	---	---	---	---	---	None	---	None
		Mar-May	1.5-2.0	2.0-5.0	Perched	---	---	None	---	None
		Jun-Dec	---	---	---	---	---	None	---	None
ScD3:										
St. Clair-------	D	Jan-Feb	---	---	---	---	---	None	---	None
		Mar-May	1.5-2.0	2.0-5.0	Perched	---	---	None	---	None
		Jun-Dec	---	---	---	---	---	None	---	None
ScE3:										
St. Clair-------	D	Jan-Feb	---	---	---	---	---	None	---	None
		Mar-May	1.5-2.0	2.0-5.0	Perched	---	---	None	---	None
		Jun-Dec	---	---	---	---	---	None	---	None
ScF3:										
St. Clair-------	D	Jan-Feb	---	---	---	---	---	None	---	None
		Mar-May	1.5-2.0	2.0-5.0	Perched	---	---	None	---	None
		Jun-Dec	---	---	---	---	---	None	---	None
SdB:										
Seward----------	B	Jan-Apr	>3.0	3.5-5.0	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
SdC:										
Seward----------	B	Jan-Apr	>3.0	3.5-5.0	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
SdD:										
Seward----------	B	Jan-Apr	>3.0	3.5-5.0	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
SeB:										
Seward----------	B	Jan-Apr	>3.0	3.5-5.0	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
SeC:										
Seward----------	B	Jan-Apr	>3.0	3.5-5.0	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
SfA:										
Shinrock Variant	C	Jan-May	1.5-2.0	2.5-3.5	Perched	---	---	None	---	None
		Jun-Nov	---	---	---	---	---	None	---	None
		Dec	1.5-2.0	2.5-3.5	Perched	---	---	None	---	None
Sh:										
Shoals----------	C	Jan-Apr	0.5-1.0	>6.0	Apparent	---	---	None	Brief	Frequent
		May-Jun	---	---	---	---	---	None	Brief	Frequent
		Jul-Sep	---	---	---	---	---	None	---	None
		Oct-Dec	---	---	---	---	---	None	Brief	Frequent
Sm:										
Sloan-----------	B	Jan-Jun	0.0-1.0	>5.0	Apparent	0.0-1.0	Brief	Frequent	Brief	Frequent
		Jul-Oct	---	---	---	---	---	None	---	None
		Nov-Dec	0.0-1.0	>5.0	Apparent	0.0-1.0	Brief	Frequent	Brief	Frequent
Sn:										
Sloan-----------	B/D	Jan-Jun	0.0-0.5	>6.0	Apparent	---	---	None	Very brief	Occasional
		Jul-Oct	---	---	---	---	---	None	---	None
		Nov-Dec	0.0-0.5	>6.0	Apparent	---	---	None	Very brief	Occasional
So:										
Sloan-----------	B/D	Jan-Jun	0.0-1.0	>6.0	Apparent	---	---	None	Brief	Frequent
		Jul-Oct	---	---	---	---	---	None	---	None
		Nov-Dec	0.0-1.0	>6.0	Apparent	---	---	None	Brief	Frequent
SpB:										
Spinks----------	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
SpC:										
Spinks----------	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
SpD:										
Spinks----------	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None

Table 31.--Water Features Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
TdA:										
Tedrow----------	B	Jan-Apr	0.5-1.0	>6.0	Apparent	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
TeA:										
Tedrow Variant--	B	Jan-Apr	0.5-1.0	>6.0	Apparent	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
To:										
Toledo----------	D	Jan-Apr	0.0-1.0	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
		May-Dec	---	---	---	---	---	None	---	None
Tt:										
Toledo----------	D	Jan-Apr	0.0-1.0	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
		May-Dec	---	---	---	---	---	None	---	None
TuB2:										
Tuscola---------	B	Jan-Apr	2.0-3.0	>6.0	Apparent	---	---	None	---	None
		May-Oct	---	---	---	---	---	None	---	None
		Nov-Dec	2.0-3.0	>6.0	Apparent	---	---	None	---	None
TuC2:										
Tuscola---------	B	Jan-Apr	2.0-3.0	>6.0	Apparent	---	---	None	---	None
		May-Oct	---	---	---	---	---	None	---	None
		Nov-Dec	2.0-3.0	>6.0	Apparent	---	---	None	---	None
Ud:										
Udorthents------	---	Jan-Dec	---	---	---	---	---	---	---	None
Ur:										
Urban land------	---	Jan-Dec	---	---	---	---	---	---	---	None
VaA:										
Vaughnsville----	C	Jan-Apr	2.0-3.0	>6.0	Apparent	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
Wa:										
Wabasha---------	D	Jan-May	0.0-1.0	>6.0	Apparent	---	---	None	Long	Frequent
		Jun	0.0-1.0	>6.0	Apparent	---	---	None	---	None
		Jul-Nov	---	---	---	---	---	None	---	None
		Dec	0.0-1.0	>6.0	Apparent	---	---	None	---	None
Wc:										
Warners---------	D	Jan-Jun	0.0-0.5	>6.0	Apparent	---	---	None	---	None
		Jul-Oct	---	---	---	---	---	None	---	None
		Nov-Dec	0.0-0.5	>6.0	Apparent	---	---	None	---	None
Wf:										
Wauseon---------	B/D	Jan-Apr	0.0-1.0	2.5-4.5	Perched	0.0-1.0	Long	Frequent	---	None
		May-Dec	---	---	---	---	---	None	---	None
Wg:										
Wauseon---------	B/D	Jan-Apr	0.0-1.0	2.5-4.5	Perched	0.0-1.0	Long	Frequent	---	None
		May-Dec	---	---	---	---	---	None	---	None

TABLE 32.--SOIL FEATURES

(See text on page 208 for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
Ad: Adrian	---	> 50	---	---		29-33	High	High	Low.
ArB: Arkport	---	> 75	---	---		---	Low	Low	Moderate.
ArC: Arkport	---	> 79	---	---		---	Low	Low	Moderate.
AsA: Aurand	Dense material	40- 60	---	---	---	---	High	High	Moderate.
AtA: Aurand	Dense material	40- 60	---	---	---	---	High	High	Moderate.
BcA: Bixler	---	> 60	---	---		---	High	Moderate	Moderate.
Ca: Clay pits	---	---	---	---		---	---	---	---
Ch: Cohoctah	---	> 71	---	---		---	High	High	Low.
Ck: Colwood	---	> 60	---	---	---	---	High	High	Low.
Cm: Colwood	---	> 60	---	---	---	---	High	High	Low.
Cn: Colwood	---	> 65	---	---		---	High	High	Low.
Co: Colwood	---	> 65	---	---		---	High	High	Low.
Cu: Cut and fill land	---	---	---	---		---	---	---	---
DeA: Del Rey	---	> 52	---	---		---	High	High	Moderate.
DfA: Del Rey	---	> 52	---	---		---	High	High	Moderate.
DuA: Digby	---	> 50	---	---		---	High	Moderate	Moderate.
DyA: Digby	---	> 50	---	---		---	High	Moderate	Moderate.
DzA: Digby	---	> 60	---	---		---	High	Moderate	High.
Ee: Eel	---	> 60	---	---	---	---	High	Moderate	Low.
FsA: Fulton	---	> 60	---	---		---	Moderate	High	Moderate.
FsB: Fulton	---	> 60	---	---		---	Moderate	High	Moderate.
FuA: Fulton	---	> 60	---	---		---	Moderate	High	Moderate.
FuB: Fulton	---	> 60	---	---		---	Moderate	High	Moderate.
FvA: Fulton Variant	---	> 64	---	---		---	High	High	Moderate.
GaA: Galen	---	> 92	---	---		---	Moderate	Low	Moderate.
GaB: Galen	---	> 92	---	---		---	Moderate	Low	Moderate.
GbB: Galen	---	> 68	---	---		---	Moderate	Moderate	Low.
Gm: Genesee	---	> 52	---	---		---	Moderate	Low	Low.

Table 32.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
Go:									
Gilford	---	> 60	---	---		---	High	High	Low.
Gr:									
Granby	---	> 63	---	---		---	Moderate	High	Low.
Gv:									
Gravel pits	---	---	---	---		---	---	---	---
HaA:									
Haney	---	> 80	---	---		---	High	Moderate	Moderate.
HaB:									
Haney	---	> 80	---	---		---	High	Moderate	Moderate.
HdA:									
Haney	---	> 80	---	---		---	High	Moderate	Moderate.
HdB:									
Haney	---	> 80	---	---		---	High	Moderate	Moderate.
HeC:									
Haney	---	> 80	---	---		---	High	Moderate	Moderate.
Rawson	---	> 60	---	---		---	Moderate	Moderate	High.
HkA:									
Haskins	---	> 60	---	---		---	High	High	Low.
HlA:									
Haskins	---	> 60	---	---		---	High	High	Low.
HlB:									
Haskins	---	> 60	---	---		---	High	High	Moderate.
HnA:									
Haskins	---	> 64	---	---		---	High	High	Low.
Ho:									
Hoytville	---	> 60	---	---		---	High	High	Low.
Hp:									
Hoytville	Dense material	50- 70	---	---	---	---	High	High	Low.
Hr:									
Hoytville	Dense material	50- 70	---	---	---	---	High	High	Low.
Hs:									
Hoytville	Dense material	50- 70	---	---	---	---	High	High	Low.
Hv:									
Hoytville	---	> 60	---	---		---	High	High	Low.
Hw:									
Hoytville Variant	---	> 44	---	---		---	High	High	Low.
KeA:									
Kibbie	---	> 60	---	---	---	---	High	High	Moderate.
KfA:									
Kibbie	---	> 72	---	---		---	High	High	Low.
KlA:									
Kibbie	---	> 71	---	---		---	High	High	Low.
La:									
Latty	---	> 71	---	---		---	Moderate	High	Low.
Lb:									
Latty	---	> 60	---	---		---	Moderate	High	Low.
Le:									
Lenawee	---	> 61	---	---		---	High	High	Low.
Lf:									
Lenawee	---	> 61	---	---		---	High	High	Low.
LwB2:									
Lucas	---	> 60	---	---		---	Moderate	High	Moderate.
LwC2:									
Lucas	---	> 60	---	---		---	Moderate	High	Moderate.
LxC3:									
Lucas	---	> 60	---	---		---	Moderate	High	Moderate.
LxE3:									
Lucas	---	> 60	---	---		---	Moderate	High	Moderate.

Table 32.--Soil Features--Continued

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Restrictive layer: Thickness	Restrictive layer: Hardness	Subsidence: Initial	Subsidence: Total	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In	In		In	In			
Mb:									
Mermill	---	> 80	---	---	---	---	High	High	Moderate.
Aurand	Dense material	40- 60	---	---	---	---	High	High	Moderate.
Mc:									
Mermill	---	> 60	---	---		---	High	Moderate	Moderate.
Md:									
Medway	---	> 60	---	---		---	High	Moderate	Low.
Me:									
Mermill	---	> 60	---	---		---	High	High	Low.
Mf:									
Mermill	---	> 60	---	---		---	High	High	Low.
Mg:									
Mermill	---	> 66	---	---	---	---	High	High	Low.
Mh:									
Millgrove	---	> 72	---	---		---	High	High	Moderate.
Mk:									
Millgrove	---	> 72	---	---		---	High	High	Moderate.
NaA:									
Nappanee	---	> 60	---	---		---	Moderate	High	Moderate.
NaB:									
Nappanee	---	> 60	---	---		---	Moderate	High	Moderate.
NtA:									
Nappanee	---	> 60	---	---		---	Moderate	High	Moderate.
NtB:									
Nappanee	---	> 60	---	---		---	Moderate	High	Moderate.
NtB2:									
Nappanee	---	> 60	---	---		---	Moderate	High	Moderate.
OaC:									
Oakville	---	>100	---	---		---	Low	Low	Moderate.
ObB:									
Oakville	---	> 80	---	---		---	Low	Low	Moderate.
ObC:									
Oakville	---	> 60	---	---		---	Low	Low	Moderate.
OsB:									
Oshtemo	---	> 70	---	---		---	Low	Low	Moderate.
OtB:									
Ottokee	---	> 81	---	---		---	Low	Low	Moderate.
OuB:									
Ottokee	---	> 78	---	---		---	Low	Low	Low.
OzB:									
Ottokee	---	> 60	---	---	---	---	Low	Low	Low.
Spinks	---	> 60	---	---	---	---	Low	Low	Low.
Pa:									
Paulding	---	> 60	---	---		---	Moderate	High	Moderate.
Pt:									
Pits, quarry	---	---	---	---	---	---	---	---	---
RaB:									
Rawson	---	> 60	---	---		---	Moderate	High	Moderate.
RdB:									
Rawson	---	> 60	---	---		---	Moderate	High	Moderate.
ReB:									
Rawson	---	> 60	---	---		---	Moderate	High	Moderate.
RfA:									
Rimer	---	> 70	---	---		---	High	High	Low.
RgA:									
Rimer	---	> 60	---	---		---	High	High	Moderate.

Table 32.--Soil Features--Continued

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Restrictive layer: Thickness	Restrictive layer: Hardness	Subsidence: Initial	Subsidence: Total	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In	In		In	In			
RhB:									
Rimer	---	> 60	---	---	---	---	High	High	Moderate.
Tedrow	---	> 60	---	---	---	---	Moderate	Low	Low.
RmA:									
Rimer	---	> 64	---	---		---	High	High	Low.
RoA:									
Roselms	---	> 60	---	---		---	Moderate	High	Moderate.
RrA:									
Roselms	---	> 60	---	---		---	Moderate	High	Moderate.
Rs:									
Ross	---	> 61	---	---		---	Moderate	Low	Low.
SaE3:									
St. Clair	---	> 60	---	---		---	Moderate	High	Moderate.
SbB2:									
St. Clair	---	> 60	---	---		---	Moderate	High	Moderate.
SbC2:									
St. Clair	---	> 60	---	---		---	Moderate	High	Moderate.
SbD2:									
St. Clair	---	> 60	---	---	---	---	Moderate	High	Moderate.
SbE2:									
St. Clair	---	> 60	---	---	---	---	Moderate	High	Moderate.
ScC3:									
St. Clair	---	> 60	---	---		---	Moderate	High	Moderate.
ScD3:									
St. Clair	---	> 60	---	---		---	Moderate	High	Moderate.
ScE3:									
St. Clair	---	> 60	---	---		---	Moderate	High	Moderate.
ScF3:									
St. Clair	---	> 60	---	---		---	Moderate	High	Moderate.
SdB:									
Seward	---	> 60	---	---		---	Moderate	Moderate	Moderate.
SdC:									
Seward	---	> 60	---	---		---	Moderate	Moderate	Moderate.
SdD:									
Seward	---	> 60	---	---		---	Moderate	Moderate	Moderate.
SeB:									
Seward	---	> 94	---	---		---	Moderate	Moderate	Moderate.
SeC:									
Seward	---	> 94	---	---		---	Moderate	Moderate	Moderate.
SfA:									
Shinrock Variant	---	> 82	---	---		---	High	Moderate	Moderate.
Sh:									
Shoals	---	> 60	---	---		---	High	High	Low.
Sm:									
Sloan	---	> 60	---	---	---	---	High	High	Low.
Sn:									
Sloan	---	> 67	---	---		---	High	High	Low.
So:									
Sloan	---	> 72	---	---		---	High	High	Low.
SpB:									
Spinks	---	>153	---	---		---	Low	Low	Moderate.
SpC:									
Spinks	---	>153	---	---		---	Low	Low	Moderate.
SpD:									
Spinks	---	>153	---	---		---	Low	Low	Moderate.
TdA:									
Tedrow	---	> 60	---	---		---	Moderate	Low	Low.

Table 32.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
TeA:									
Tedrow Variant-----	---	> 50	---	---		---	Moderate----	Low---------	Low.
To:									
Toledo-------------	---	> 68	---	---		---	Moderate----	High--------	Low.
Tt:									
Toledo-------------	---	> 68	---	---		---	Moderate----	High--------	Low.
TuB2:									
Tuscola------------	---	> 68	---	---		---	High--------	Moderate----	Moderate.
TuC2:									
Tuscola------------	---	> 68	---	---		---	High--------	Moderate----	Moderate.
Ud:									
Udorthents---------	---	---	---	---		---	---	---	---
Ur:									
Urban land---------	---	---	---	---		---	---	---	---
VaA:									
Vaughnsville-------	---	> 60	---	---		---	High--------	High--------	Low.
W:									
Water--------------	---	---	---	---		---	---	---	---
Wa:									
Wabasha------------	---	> 70	---	---		---	High--------	High--------	Low.
Wc:									
Warners------------	---	> 50	---	---	---	---	High--------	High--------	Low.
Wf:									
Wauseon------------	---	> 60	---	---		---	High--------	High--------	Low.
Wg:									
Wauseon------------	---	> 60	---	---		---	High--------	High--------	Low.

TABLE 33.--CLASSIFICATION OF THE SOILS

(An asterisk in the first column indicates a taxadjunct to the series. See text on page 209 for a description of those characteristics that are outside the range of the series.)

Soil name	Family or higher taxonomic class
Adrian	Sandy or sandy-skeletal, mixed, euic, mesic Terric Medisaprists
Arkport	Mixed, mesic Psammentic Hapludalfs
Aurand	Fine-loamy, mixed, active, mesic Aquic Argiudolls
Bixler	Loamy, mixed, mesic Aquic Arenic Hapludalfs
Cohoctah	Coarse-loamy, mixed, mesic Fluvaquentic Haplaquolls
Colwood	Fine-loamy, mixed, mesic Typic Haplaquolls
*Colwood	Fine-loamy, mixed, active, mesic Typic Endoaquolls
Del Rey	Fine, illitic, mesic Aeric Ochraqualfs
Digby	Fine-loamy, mixed, mesic Aeric Ochraqualfs
Eel	Fine-loamy, mixed, superactive, mesic Fluvaquentic Eutrudepts
Fulton	Fine, illitic, mesic Aeric Ochraqualfs
Fulton Variant	Fine, illitic, mesic Aeric Ochraqualfs
Galen	Mixed, mesic Psammentic Hapludalfs
Genesee	Fine-loamy, mixed, mesic Fluventic Eutrochrepts
Gilford	Coarse-loamy, mixed, mesic Typic Haplaquolls
Granby	Sandy, mixed, mesic Typic Haplaquolls
Haney	Fine-loamy, mixed, mesic Aquic Hapludalfs
Haskins	Fine-loamy, mixed, mesic Aeric Ochraqualfs
Hoytville	Fine, illitic, mesic Mollic Epiaqualfs
Hoytville	Fine, illitic, mesic Mollic Ochraqualfs
Hoytville Variant	Fine, illitic, mesic Mollic Haplaquepts
*Kibbie	Fine-loamy, mixed, active, mesic Aquollic Hapludalfs
*Kibbie	Fine-loamy, mixed, mesic Aquollic Hapludalfs
Latty	Fine, illitic, nonacid, mesic Typic Haplaquepts
*Lenawee	Fine, mixed, nonacid, mesic Mollic Haplaquepts
Lucas	Fine, illitic, mesic Typic Hapludalfs
*Medway	Fine-loamy, mixed, mesic Fluvaquentic Hapludolls
Mermill	Fine-loamy, mixed, active, mesic Mollic Epiaqualfs
Mermill	Fine-loamy, mixed, mesic Mollic Epiaqualfs
Mermill	Fine-loamy, mixed, mesic Mollic Ochraqualfs
Millgrove	Fine-loamy, mixed, mesic Typic Argiaquolls
Nappanee	Fine, illitic, mesic Aeric Ochraqualfs
Oakville	Mixed, mesic Typic Udipsamments
Oshtemo	Coarse-loamy, mixed, mesic Typic Hapludalfs
Ottokee	Mixed, mesic Alfic Udipsamments
Ottokee	Mixed, mesic Aquic Udipsamments
Paulding	Very-fine, illitic, nonacid, mesic Typic Haplaquepts
Rawson	Fine-loamy, mixed, mesic Typic Hapludalfs
Rimer	Loamy, mixed, active, mesic Aquic Arenic Hapludalfs
Rimer	Loamy, mixed, mesic Aquic Arenic Hapludalfs
Roselms	Very-fine, illitic, mesic Aeric Ochraqualfs
Ross	Fine-loamy, mixed, mesic Cumulic Hapludolls
Seward	Loamy, mixed, mesic Arenic Hapludalfs
Shinrock Variant	Fine, illitic, mesic Aquic Hapludalfs
Shoals	Fine-loamy, mixed, nonacid, mesic Aeric Fluvaquents
Sloan	Fine-loamy, mixed, mesic Fluvaquentic Haplaquolls
Sloan	Fine-loamy, mixed, superactive, mesic Fluvaquentic Endoaquolls
Spinks	Mixed, mesic Psammentic Hapludalfs
Spinks	Sandy, mixed, mesic Lamellic Hapludalfs
St. Clair	Fine, illitic, mesic Oxyaquic Hapludalfs
St. Clair	Fine, illitic, mesic Typic Hapludalfs
Tedrow	Mixed, mesic Aquic Udipsamments
Tedrow, till substratum	Mixed, mesic Aquic Udipsamments
Tedrow Variant	Mixed, mesic Aquic Udipsamments
Toledo	Fine, illitic, nonacid, mesic Mollic Haplaquepts
Tuscola	Fine-loamy, mixed, mesic Typic Hapludalfs
Udorthents	Loamy, mixed, mesic Typic Udorthents
*Vaughnsville	Fine-loamy, mixed, mesic Aquic Hapludalfs
Wabasha	Fine, illitic, nonacid, mesic Mollic Fluvaquents
Warners	Fine-silty, carbonatic, mesic Fluvaquentic Haplaquolls
Wauseon	Coarse-loamy over clayey, mixed, mesic Typic Haplaquolls

TABLE 34.--INTERPRETIVE GROUPS

(Unless otherwise indicated, a complex is treated as a single management unit in the 'Land capability' column. See text See text on page 190 for definitions of the groups. Absence of an entry indicates that the map unit is not suited to the intended use or is not rated.)

Map symbol and soil name	Land capability classification	Pasture and hayland suitability group	Prime farmland	Hydric
Ad:	4w		Not prime farmland	
Adrian		D-1		Yes
ArB:	2e		All areas are prime farmland	
Arkport		B-1		No
ArC:	3e		Not prime farmland	
Arkport		A-1		No
AsA:	2w		Prime farmland if drained	
Aurand		C-1		No
AtA:	2w		Prime farmland if drained	
Aurand		C-1		No
BcA:	2w		All areas are prime farmland	
Bixler		C-1		No
Ca:	---		Not prime farmland	
Clay Pits		Not rated		Unranked
Ch:	3w		Prime farmland if drained	
Cohoctah		B-3		Yes
Ck:	2w		Prime farmland if drained	
Colwood		C-1		Yes
Cm:	2w		Prime farmland if drained	
Colwood		C-1		Yes
Cn:	2w		Prime farmland if drained	
Colwood		C-1		Yes
Co:	2w		Prime farmland if drained	
Colwood		C-1		Yes
Cu:	---		Not prime farmland	
Cut And Fill Land		Not rated		Unranked
DeA:	2w		Prime farmland if drained	
Del Rey		C-1		No
DfA:	2w		Prime farmland if drained	
Del Rey		C-1		No

TABLE 34.--Interpretive Groups--Continued

Map symbol and soil name	Land capability classification	Pasture and hayland suitability group	Prime farmland	Hydric
DuA:	2w		Prime farmland if drained	
Digby		C-1		No
DyA:	2w		Prime farmland if drained	
Digby		C-1		No
DzA:	2w		Prime farmland if drained	
Digby		C-1		No
Ee:	2w		Prime farmland if protected from flooding or not frequently flooded during the growing season	
Eel		A-5		No
FsA:	3w		Prime farmland if drained	
Fulton		C-2		No
FsB:	3e		Prime farmland if drained	
Fulton		C-2		No
FuA:	3w		Prime farmland if drained	
Fulton		C-2		No
FuB:	3e		Prime farmland if drained	
Fulton		C-2		No
FvA:	3w		Prime farmland if drained	
Fulton Variant		C-2		No
GaA:	2s		All areas are prime farmland	
Galen		A-1		No
GaB:	2e		All areas are prime farmland	
Galen		A-1		No
GbB:	2e		All areas are prime farmland	
Galen		A-1		No
Gm:	2w		All areas are prime farmland	
Genesee		A-5		No
Go:	2w		Prime farmland if drained	
Gilford		C-1		Yes
Gr:	4w		Not prime farmland	
Granby		C-1		Yes

TABLE 34.--Interpretive Groups--Continued

Map symbol and soil name	Land capability classification	Pasture and hayland suitability group	Prime farmland	Hydric
Gv:	---		Not prime farmland	
Gravel Pits		Not rated		Unranked
HaA:	1		All areas are prime farmland	
Haney		A-6		No
HaB:	2e		All areas are prime farmland	
Haney		A-6		No
HdA:	1		All areas are prime farmland	
Haney		A-6		No
HdB:	2e		All areas are prime farmland	
Haney		A-6		No
HeC:	3e		Not prime farmland	
Haney		A-6		No
Rawson		F-5		No
HkA:	2w		Prime farmland if drained	
Haskins		C-2		No
HlA:	2w		Prime farmland if drained	
Haskins		C-2		No
HlB:	2e		Prime farmland if drained	
Haskins		C-2		No
HnA:	2w		Prime farmland if drained	
Haskins		C-2		No
Ho:	2w		Prime farmland if drained	
Hoytville		C-1		Yes
Hp:	2w		Prime farmland if drained	
Hoytville		C-1		Yes
Hr:	2w		Prime farmland if drained	
Hoytville		C-1		Yes
Hs:	2w		Prime farmland if drained	
Hoytville		C-1		Yes
Hv:	2w		Prime farmland if drained	
Hoytville		C-2		Yes

TABLE 34.--Interpretive Groups--Continued

Map symbol and soil name	Land capability classification	Pasture and hayland suitability group	Prime farmland	Hydric
Hw:	2w		Prime farmland if drained	
Hoytville Variant		C-1		Yes
KeA:	2w		Prime farmland if drained	
Kibbie		C-1		No
KfA:	2w		Prime farmland if drained	
Kibbie		C-1		No
KlA:	2w		Prime farmland if drained	
Kibbie		C-1		No
La:	3w		Prime farmland if drained	
Latty		C-2		Yes
Lb:	3w		Prime farmland if drained	
Latty		C-2		Yes
Le:	2w		Prime farmland if drained	
Lenawee		C-1		Yes
Lf:	2w		Prime farmland if drained	
Lenawee		C-1		Yes
LwB2:	3e		All areas are prime farmland	
Lucas		F-5		No
LwC2:	4e		Not prime farmland	
Lucas		F-5		No
LxC3:	6e		Not prime farmland	
Lucas		F-5		No
LxE3:	7e		Not prime farmland	
Lucas		F-6		No
Mb:	2w		Prime farmland if drained	
Mermill		C-1		Yes
Aurand		C-1		No
Mc:	2w		Prime farmland if drained	
Mermill		C-2		Yes
Md:	2w		All areas are prime farmland	
Medway		A-5		No
Me:	2w		Prime farmland if drained	
Mermill		C-1		Yes

TABLE 34.--Interpretive Groups--Continued

Map symbol and soil name	Land capability classification	Pasture and hayland suitability group	Prime farmland	Hydric
Mf:	2w		Prime farmland if drained	
Mermill		C-1		Yes
Mg:	2w		Prime farmland if drained	
Mermill		C-1		Yes
Mh:	2w		Prime farmland if drained	
Millgrove		C-1		Yes
Mk:	2w		Prime farmland if drained	
Millgrove		C-1		Yes
NaA:	3w		Prime farmland if drained	
Nappanee		C-2		No
NaB:	3e		Prime farmland if drained	
Nappanee		C-2		No
NtA:	3w		Prime farmland if drained	
Nappanee		C-2		No
NtB:	3e		Prime farmland if drained	
Nappanee		C-2		No
NtB2:	3e		Prime farmland if drained	
Nappanee		C-2		No
OaC:	6s		Not prime farmland	
Oakville		B-1		No
ObB:	4s		Not prime farmland	
Oakville		B-1		No
ObC:	6s		Not prime farmland	
Oakville		B-1		No
OsB:	3s		All areas are prime farmland	
Oshtemo		A-1		No
OtB:	3s		Not prime farmland	
Ottokee		B-1		No
OuB:	3s		Farmland of local importance	
Ottokee		B-1		No
OzB:	3s		Not prime farmland	
Ottokee		B-1		No
Spinks		B-1		No

TABLE 34.--Interpretive Groups--Continued

Map symbol and soil name	Land capability classification	Pasture and hayland suitability group	Prime farmland	Hydric
Pa:	3w		Not prime farmland	
Paulding		F-7		Yes
Pt:	---		Not prime farmland	
Pits, Quarry		Not rated		Unranked
RaB:	2e		All areas are prime farmland	
Rawson		F-5		No
RdB:	2e		All areas are prime farmland	
Rawson		F-5		No
ReB:	2e		All areas are prime farmland	
Rawson		F-5		No
RfA:	2w		Prime farmland if drained	
Rimer		C-2		No
RgA:	2w		Prime farmland if drained	
Rimer		C-1		No
RhB:	2e		Prime farmland if drained	
Rimer		C-1		No
Tedrow		C-1		No
RmA:	2w		Prime farmland if drained	
Rimer		C-1		No
RoA:	3w		Not prime farmland	
Roselms		F-7		No
RrA:	3w		Not prime farmland	
Roselms		F-7		No
Rs:	2w		All areas are prime farmland	
Ross		A-5		No
SaE3:	7e		Not prime farmland	
St. Clair		F-6		No
SbB2:	3e		All areas are prime farmland	
St. Clair		F-5		No
SbC2:	4e		Not prime farmland	
St. Clair		F-5		No
SbD2:	6e		Not prime farmland	
St. Clair		F-5		No
SbE2:	7e		Not prime farmland	
St. Clair		F-5		No

TABLE 34.--Interpretive Groups--Continued

Map symbol and soil name	Land capability classification	Pasture and hayland suitability group	Prime farmland	Hydric
ScC3:	6e		Not prime farmland	
St. Clair		F-5		No
ScD3:	7e		Not prime farmland	
St. Clair		F-5		No
ScE3:	7e		Not prime farmland	
St. Clair		F-5		No
ScF3:	7e		Not prime farmland	
St. Clair		F-6		No
SdB:	2e		Not prime farmland	
Seward		F-5		No
SdC:	3e		Not prime farmland	
Seward		F-5		No
SdD:	4e		Not prime farmland	
Seward		F-5		No
SeB:	2e		Not prime farmland	
Seward		A-1		No
SeC:	3e		Not prime farmland	
Seward		A-1		No
SfA:	2s		All areas are prime farmland	
Shinrock Variant		A-6		No
Sh:	2w		Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season	
Shoals		C-3		No
Sm:	3w		Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season	
Sloan		C-3		Yes
Sn:	3w		Prime farmland if drained	
Sloan		C-3		Yes
So:	3w		Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season	
Sloan		C-3		Yes

TABLE 34.--Interpretive Groups--Continued

Map symbol and soil name	Land capability classification	Pasture and hayland suitability group	Prime farmland	Hydric
SpB:	3s		Not prime farmland	
Spinks		B-1		No
SpC:	3e		Not prime farmland	
Spinks		B-1		No
SpD:	4e		Not prime farmland	
Spinks		B-1		No
TdA:	3s		Not prime farmland	
Tedrow		C-1		No
TeA:	2w		Not prime farmland	
Tedrow Variant		C-1		No
To:	3w		Prime farmland if drained	
Toledo		C-2		Yes
Tt:	3w		Prime farmland if drained	
Toledo		C-2		Yes
TuB2:	2e		All areas are prime farmland	
Tuscola		A-6		No
TuC2:	3e		Not prime farmland	
Tuscola		A-6		No
Ud:	---		Not prime farmland	
Udorthents		Not rated		Unranked
Ur:	---		Not prime farmland	
Urban Land		Not rated		Unranked
VaA:	2w		All areas are prime farmland	
Vaughnsville		A-6		No
W:	---		Not prime farmland	
Water		Not rated		Unranked
Wa:	3w		Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season	
Wabasha		C-3		Yes
Wc:	3w		Not prime farmland	
Warners		D-1		Yes
Wf:	3w		Prime farmland if drained	
Wauseon		C-1		Yes
Wg:	3w		Prime farmland if drained	
Wauseon		C-1		Yes