United States Department of Agriculture

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Natural Resources Conservation Service

Iowa Department of Agriculture and Land Stewardship

IOWA STATE UNIVERSITY
Iowa Agriculture and Home Economics Experiment Station

IOWA STATE UNIVERSITY
University Extension

In cooperation with Iowa Agriculture and Home Economics Experiment Station and Cooperative Extension Service, Iowa State University; and Division of Soil Conservation, Iowa Department of Agriculture and Land Stewardship

Soil Survey of Black Hawk County, Iowa

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How To Use This Soil Survey

General Soil Map

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

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

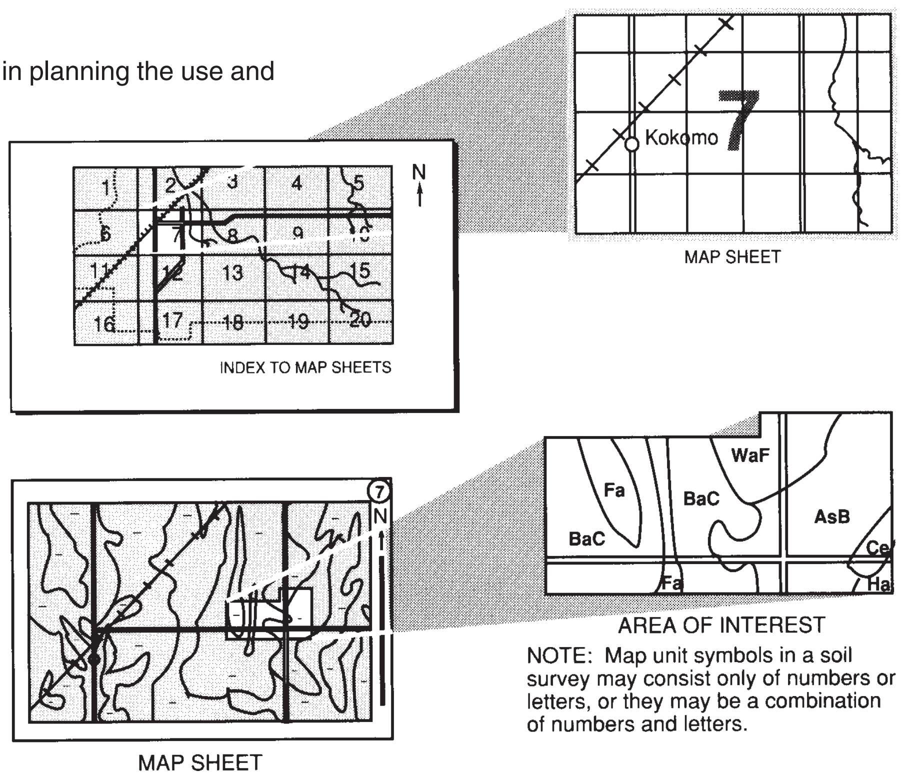
Detailed Soil Maps

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

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

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

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



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

Major fieldwork for this soil survey was completed in 2001. Soil names and descriptions were approved in 2001. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 2001. This survey was made cooperatively by the Natural Resources Conservation Service and the Iowa Agriculture and Home Economics Experiment Station. It is part of the technical assistance furnished to the Black Hawk County Soil and Water Conservation District. Assistance with the survey was provided by the Cooperative Extension Service, Iowa State University; the Division of Soil Conservation, Iowa Department of Agriculture and Land Stewardship; and the Black Hawk County Board of Supervisors. Funds appropriated by Black Hawk County were used to defray part of the cost of the survey.

Cover: An aerial view of the Sparta-Finchford-Saude association in the Cedar River valley.

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

Contents

Issued 2006

Foreword

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

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

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, and information on specific uses is given. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Richard Van Klaveren
State Conservationist
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Soil Survey of
Black Hawk County, Iowa

By Sam R. Steckly, Natural Resources Conservation Service

Fieldwork by Leland D. Camp, Robert O. Didericksen, Joseph A. Falkenberg, and Sam R. Steckly, Natural Resources Conservation Service

United States Department of Agriculture, Natural Resources Conservation Service, in cooperation with
the Iowa Agriculture and Home Economics Experiment Station; the Cooperative Extension Service, Iowa State University; and the Division of Soil Conservation, Iowa Department of Agriculture and Land Stewardship

BLACK HAWK COUNTY is in east-central Iowa (fig. 1). It is bordered on the north by Bremer County, on the south by Tama and Benton Counties, on the east by Buchanan County, and on the west by Butler and Grundy Counties. The county has an area of about 366,600 acres, or approximately 573 square miles. In 2000, the population of the county was 128,012 (U.S. Department of Commerce, 2000). Waterloo, the county seat, had a population of 68,747.

About 72 percent of the county is cropland; 20 percent is urban land; 5 percent is used for recreational activities; 2 percent is woodland; and 1 percent is permanent pasture.

This soil survey updates the survey of Black Hawk County published in 1978 (Fouts and Highland, 1978). It provides additional information and has larger maps, which show the soils in greater detail.

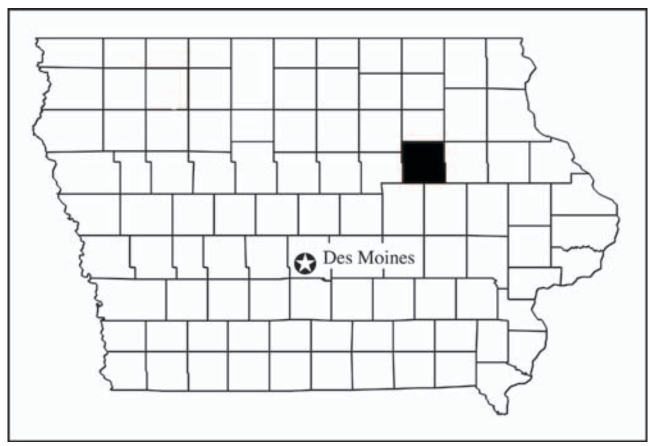

Figure 1.—Location of Black Hawk County in Iowa.

General Nature of the County

This section provides some general information about the survey area. It describes history; industry; farming; transportation facilities; recreation; physiography, drainage, and geology; and climate.

History

Black Hawk County was established in 1843. The Sauk and Fox (Meskwaki) tribes had lived here for many years, owning the area until 1837. The county was named after the renowned Sauk Chief Black Hawk.

In 1845, the county was attached to Benton County for judicial, election, and revenue purposes, and in 1851 it was attached to Buchanan County. Black Hawk County did not have its own government until 1853.

One of the earliest Europeans to visit the survey area is believed to have been a Frenchman named Gervais Paul Somaneaux. He arrived during the spring of 1837, left during the winter, and returned about 10 years later to settle in Cedar Falls, where he lived until his death in 1850 (Cedar Falls Historical Society).

The first permanent white settlement in Black Hawk County was started in March 1845 by William Sturgis and his brother-in-law, Erasmus D. Adams. They named their settlement Sturgis Falls. Sturgis built a double log cabin on the banks of the Red Cedar River and broke 5 acres of prairie. This was considered to be the first breaking of prairie land in the county. The name of Sturgis Falls was changed to Cedar Falls in 1851.

Black Hawk County has undergone a fundamental change from a strictly rural county to a predominantly urban county. By 1895, more than 50 percent of the population of the county lived in the Waterloo-Cedar Falls urban areas. In 2000, nearly 90 percent of the county's population lived in urban areas that made up 22 percent of the county's land area (fig. 2).

Industry

Manufacturing is of major economic importance in Black Hawk County. In 1994, manufacturing made up 33.4 percent of the earnings of employed persons, and farming accounted for only 1.5 percent.

Farming

In 2000, Black Hawk County had 264,700 acres of farmland, according to the USDA National Agricultural Statistics Service. Corn and soybeans were grown on 254,300 acres. The remaining agricultural acreage was used for hay, corn silage, or oats or was idle land.

In recent years, the number of farms in the county has been decreasing and the average size of farms has been increasing. In 1999, the number of farms was 1,060 and the average size of farms was 285 acres. The figures reported in 1993 were 1,160 farms with an average size of 262 acres.

Transportation Facilities

The major highways in Black Hawk County are U.S. Highway 218 and Interstate 380, which cross the county from northwest to southeast; U.S. Highway 20, which crosses from east to west; and U.S. Highway 63, which crosses from north to south. All of these highways intersect in Waterloo. Hard surface state or county roads connect these highways to all of the other communities in the county. All farms are along hard surface highways and roads or gravel roads. The major hard surface county roads are well distributed throughout the county.

One rail line provides railroad service to the communities of Waterloo, Cedar Falls, Dunkerton, LaPorte City, Hudson, and Raymond. The county has one municipal airport on the north end of Waterloo. Motor freight lines serve every trading center in the county.

Recreation

Many parks have been established throughout the county. These include Black Hawk Park, 1.5 miles north and 1 mile west of Cedar Falls; McFarlane Park, 2.5 miles east of LaPorte City; Sigglekov Park, 4 miles north and 1 mile east of Dunkerton; Thunder Woman Park, 4 miles west and 1 mile south of Janesville; Washington Union Access, 4 miles north and 2 miles west of Cedar Falls; and Byron Sergeant Memorial Park, 1 mile northeast of Hudson. The small lakes and reservoirs, rivers, creeks, and wetlands in the county provide excellent potential for recreational activities, such as hunting, fishing, and canoeing.

Physiography, Drainage, and Geology

The topography in most of the county is characterized by long, gentle slopes with open views; slightly rounded ridges; and broad, nearly level valleys with unclear valley edges and well established low gradient drainageways. The Cedar River, the Wapsipinicon River, and Black Hawk Creek are the major drainage systems in the county.

Black Hawk County is in Major Land Resource Area 104, the Iowan Erosional Surface. Erosion on a large scale is the key to the geological origins of the Iowan Erosional Surface. The landscape was last glaciated in Pre-Illinoisian time (more than 150,000 years ago) and since has lain exposed to various episodes of weathering and erosion. Extensive freeze-thaw action, massive dislodgement of loosened material, sheetwash of slopes, and violent winds were forms of erosional scouring that took place throughout the cold but ice-free tundra-covered areas some 15,000 to 20,000 years ago. The climatic conditions during this time wore down the landscape. The Pre-Illinoisian upland summits and divides were lowered, and only a small portion of the former landscapes remain in the form of a paleosol (Prior, 1991).

Climate

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

Figure 2.—An aerial view of Waterloo along the Cedar River showing some of the urban development that has taken place in the last 150 years.

In winter, the average temperature is 18 degrees F and the average daily minimum temperature is 9 degrees F. In summer, the average temperature is 71 degrees F and the average daily maximum temperature is 82 degrees F.

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

The total annual precipitation is about 34 inches. Of this total, 24 inches, or more than 70 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 13 inches.

The average seasonal snowfall is about 32 inches. On the average, 69 days of the year have at least 1 inch of snow on the ground. The number of such days varies greatly from year to year.

How This Survey Was Made

This survey was made to provide updated information about the soils and miscellaneous areas in the survey area, which is a subset of Major Land Resource Area 104. Major land resource areas (MLRAs) are geographically associated land resource units that share a common land use, elevation and topography, climate, water, soils, and vegetation (USDA, 1981). Map unit design and the detailed soil descriptions are based on the occurrence of each soil throughout the MLRA. In some cases a soil may be referred to that does not occur in the Black Hawk County survey area but that is representative of the MLRA.

The information in this survey includes a description of the soils and miscellaneous areas and their location and a discussion of their properties and the subsequent effects on 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 or segment of the landscape. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landscape, soil scientists develop a concept, or model, of how the soils were formed. Thus, during mapping, this model enables the soil scientists to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Individual soils on the landscape commonly merge into one another as their characteristics gradually change. To construct an accurate 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, soil 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. Interpretations are modified as necessary to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

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

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

The descriptions, names, and delineations of the soils in this survey may not fully agree with those of the soils in adjacent survey areas. Differences are the result of an improved knowledge of soils, modifications in series concepts, or variations in the intensity of mapping or in the extent of the soils in the survey areas.

General Soil Map Units

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

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

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

1. Dinsmore-Klingmore-Maxmore Association

Extent of the association in the survey area: 4 percent

Component Description

Dinsmore and similar soils

Extent: 47 to 57 percent of the mapped areas
Geomorphic setting: Uplands; hills
Position on the landform: Summits
Geomorphic component: Interfluves
Slope range: 2 to 5 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Parent material: Loess and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 4 feet (April)
Deepest depth to wet zone: More than 6.7 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.7 inches
Content of organic matter in the upper 10 inches: 3.3 percent

Klingmore and similar soils

Extent: 16 to 26 percent of the mapped areas
Geomorphic setting: Uplands; hills
Position on the landform: Summits
Geomorphic component: Interfluves
Slope range: 1 to 3 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Somewhat poorly drained
Parent material: Loess and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 1 foot (April)
Deepest depth to wet zone: 4 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 12.1 inches
Content of organic matter in the upper 10 inches: 5.3 percent

Maxmore and similar soils

Extent: 14 to 24 percent of the mapped areas
Geomorphic setting: Flats; uplands
Position on the landform: Summits
Geomorphic component: Interfluves
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Poorly drained
Parent material: Loess and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: At the surface (April)
Deepest depth to wet zone: 3 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.9 inches
Content of organic matter in the upper 10 inches: 6.6 percent

Minor Dissimilar Components

Sawmill and similar soils

Extent: 3 to 13 percent of the mapped areas

2. Dinsdale-Klinger-Maxfield Association (fig. 3)

Extent of the association in the survey area: 11 percent

Component Description

Dinsdale and similar soils

Extent: 38 to 48 percent of the mapped areas
Geomorphic setting: Uplands; hills
Position on the landform: Summits
Geomorphic component: Interfluves
Slope range: 2 to 9 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Parent material: Loess and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 4 feet (April)
Deepest depth to wet zone: More than 6.7 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.6 inches
Content of organic matter in the upper 10 inches: 3.2 percent

Klinger and similar soils

Extent: 16 to 26 percent of the mapped areas
Geomorphic setting: Uplands; hills
Position on the landform: Summits
Geomorphic component: Interfluves
Slope range: 1 to 3 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Somewhat poorly drained
Parent material: Loess and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 1 foot (April)
Deepest depth to wet zone: 4 feet (September)
Ponding: None

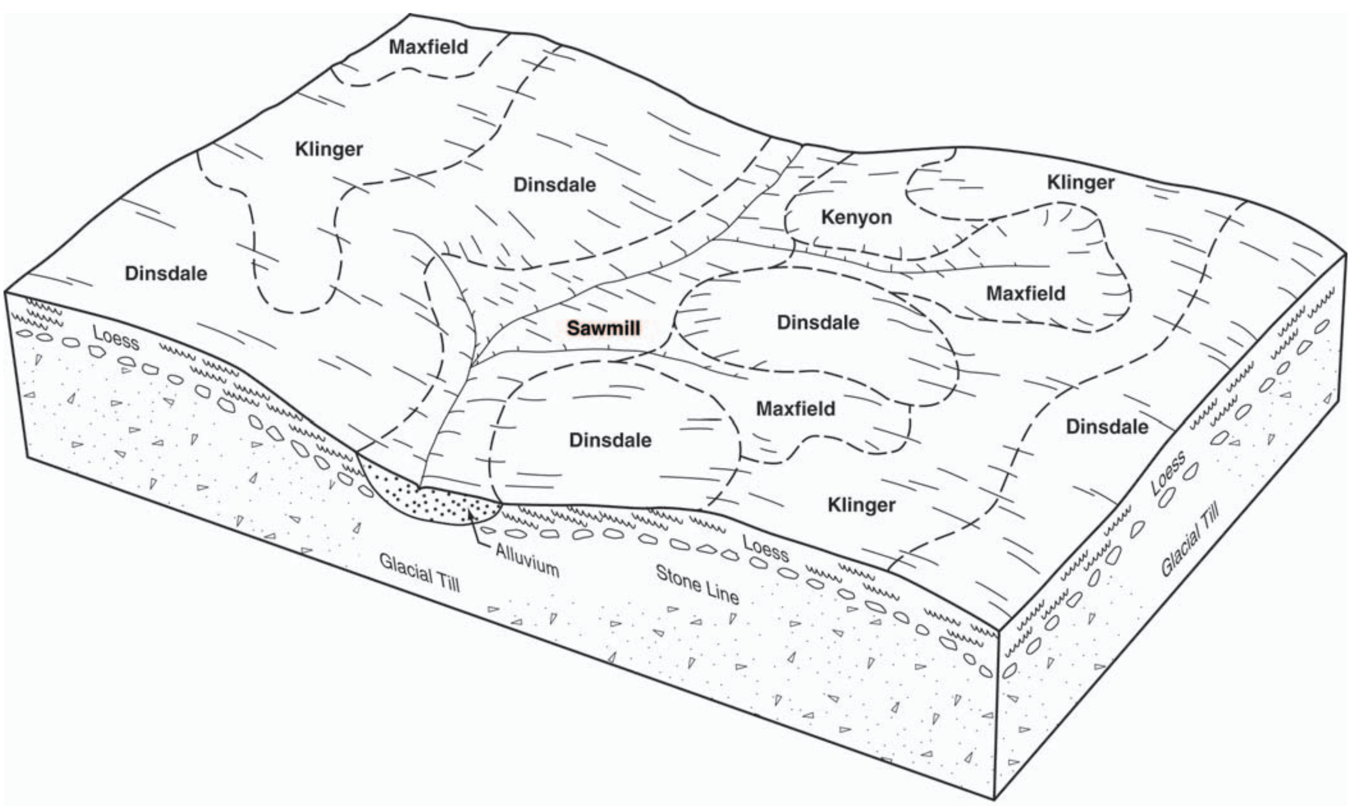

Figure 3.—Typical pattern of soils and parent material in the Dinsdale-Klinger-Maxfield association.

Available water capacity to a depth of 60 inches: 11.8 inches
Content of organic matter in the upper 10 inches: 5.4 percent

Maxfield and similar soils

Extent: 11 to 21 percent of the mapped areas
Geomorphic setting: Flats on uplands
Position on the landform: Summits
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Poorly drained
Parent material: Loess and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: At the surface (April)
Deepest depth to wet zone: 3 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.6 inches
Content of organic matter in the upper 10 inches: 6.4 percent

Minor Dissimilar Components

Kenyon and similar soils

Extent: 5 to 15 percent of the mapped areas

Sawmill and similar soils

Extent: 5 to 15 percent of the mapped areas

3. Kenyon-Clyde-Floyd Association

Extent of the association in the survey area: 34 percent

Component Description

Kenyon and similar soils

Extent: 35 to 45 percent of the mapped areas
Geomorphic setting: Hills; uplands
Position on the landform: Summits
Geomorphic component: Interfluves
Slope range: 2 to 14 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 4 feet (April)
Deepest depth to wet zone: More than 6.7 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.3 inches
Content of organic matter in the upper 10 inches: 3.3 percent

Clyde and similar soils

Extent: 14 to 24 percent of the mapped areas
Geomorphic setting: Drainageways on uplands
Slope range: 0 to 3 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Poorly drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: At the surface (April)
Deepest depth to wet zone: 3 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.7 inches
Content of organic matter in the upper 10 inches: 7 percent

Floyd and similar soils

Extent: 12 to 22 percent of the mapped areas
Geomorphic setting: Hills; uplands
Position on the landform: Footslopes
Geomorphic component: Base slopes
Slope range: 1 to 4 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Somewhat poorly drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 1 foot (April)
Deepest depth to wet zone: 4 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 10.7 inches
Content of organic matter in the upper 10 inches: 5.2 percent

Minor Dissimilar Components

Olin and similar soils

Extent: 0 to 9 percent of the mapped areas

Marquis and similar soils

Extent: 0 to 9 percent of the mapped areas

Sparta and similar soils

Extent: 0 to 9 percent of the mapped areas

Klinger and similar soils

Extent: 0 to 8 percent of the mapped areas

Maxfield and similar soils

Extent: 0 to 8 percent of the mapped areas

Dinsdale and similar soils

Extent: 0 to 8 percent of the mapped areas

Sawmill and similar soils

Extent: 0 to 8 percent of the mapped areas

Available water capacity to a depth of 60 inches: 11.1 inches
Content of organic matter in the upper 10 inches: 6.4 percent

Minor Dissimilar Components

Marquis and similar soils

Extent: 0 to 10 percent of the mapped areas

Kenyon and similar soils

Extent: 0 to 8 percent of the mapped areas

4. Readlyn-Tripoli Association

Extent of the association in the survey area: 6 percent

Component Description

Readlyn and similar soils

Extent: 51 to 61 percent of the mapped areas
Geomorphic setting: Hills; uplands
Position on the landform: Summits
Geomorphic component: Interfluves
Slope range: 1 to 3 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Somewhat poorly drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 1 foot (April)
Deepest depth to wet zone: 4 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.3 inches
Content of organic matter in the upper 10 inches: 4.7 percent

Tripoli and similar soils

Extent: 31 to 41 percent of the mapped areas
Geomorphic setting: Flats on uplands
Position on the landform: Summits
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Poorly drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: At the surface (April)
Deepest depth to wet zone: 3 feet (September)
Ponding: None

5. Sparta-Finchford-Saude Association

Extent of the association in the survey area: 23 percent

Component Description

Sparta and similar soils

Extent: 17 to 27 percent of the mapped areas
Geomorphic setting: Uplands; stream terraces
Position on the landform: Summits
Slope range: 0 to 9 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Excessively drained
Parent material: Eolian sands
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 4.7 inches
Content of organic matter in the upper 10 inches: 1.5 percent

Finchford and similar soils

Extent: 16 to 26 percent of the mapped areas
Geomorphic setting: Stream terraces
Geomorphic component: Treads
Slope range: 0 to 9 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Excessively drained
Parent material: Alluvium
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 3.5 inches
Content of organic matter in the upper 10 inches: 1.3 percent

Saude and similar soils

Extent: 13 to 23 percent of the mapped areas
Geomorphic setting: Stream terraces
Geomorphic component: Treads
Slope range: 0 to 5 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Alluvium
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 6.5 inches
Content of organic matter in the upper 10 inches: 3.4 percent

Minor Dissimilar Components

Marshan and similar soils

Extent: 7 to 17 percent of the mapped areas

Lawler and similar soils

Extent: 4 to 14 percent of the mapped areas

Spillville and similar soils

Extent: 2 to 12 percent of the mapped areas

Coland and similar soils

Extent: 2 to 12 percent of the mapped areas

Wiota and similar soils

Extent: 0 to 9 percent of the mapped areas

6. Coland-Spillville Association (fig. 4)

Extent of the association in the survey area: 11 percent

Component Description

Coland and similar soils

Extent: 37 to 47 percent of the mapped areas
Geomorphic setting: Flood plains
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Poorly drained
Parent material: Alluvium
Months in which flooding does not occur: January, December
Highest frequency of flooding: Occasional (February, March, April, May, June, July, August, September, October, November)
Shallowest depth to wet zone: At the surface (April)
Deepest depth to wet zone: 3 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.4 inches
Content of organic matter in the upper 10 inches: 5.7 percent

Spillville and similar soils

Extent: 23 to 33 percent of the mapped areas
Geomorphic setting: Flood plains
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Somewhat poorly drained
Parent material: Alluvium
Months in which flooding does not occur: January, December
Highest frequency of flooding: Occasional (February, March, April, May, June, July, August, September, October, November)
Shallowest depth to wet zone: 1 foot (April)
Deepest depth to wet zone: 4 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.8 inches
Content of organic matter in the upper 10 inches: 4.1 percent

Minor Dissimilar Components

Sigglekov and similar soils

Extent: 2 to 12 percent of the mapped areas

Saude and similar soils

Extent: 1 to 11 percent of the mapped areas

Finchford and similar soils

Extent: 0 to 10 percent of the mapped areas

Nevin and similar soils

Extent: 0 to 10 percent of the mapped areas

Lawler and similar soils

Extent: 0 to 8 percent of the mapped areas

Sparta and similar soils

Extent: 0 to 7 percent of the mapped areas

Marshan and similar soils

Extent: 0 to 7 percent of the mapped areas

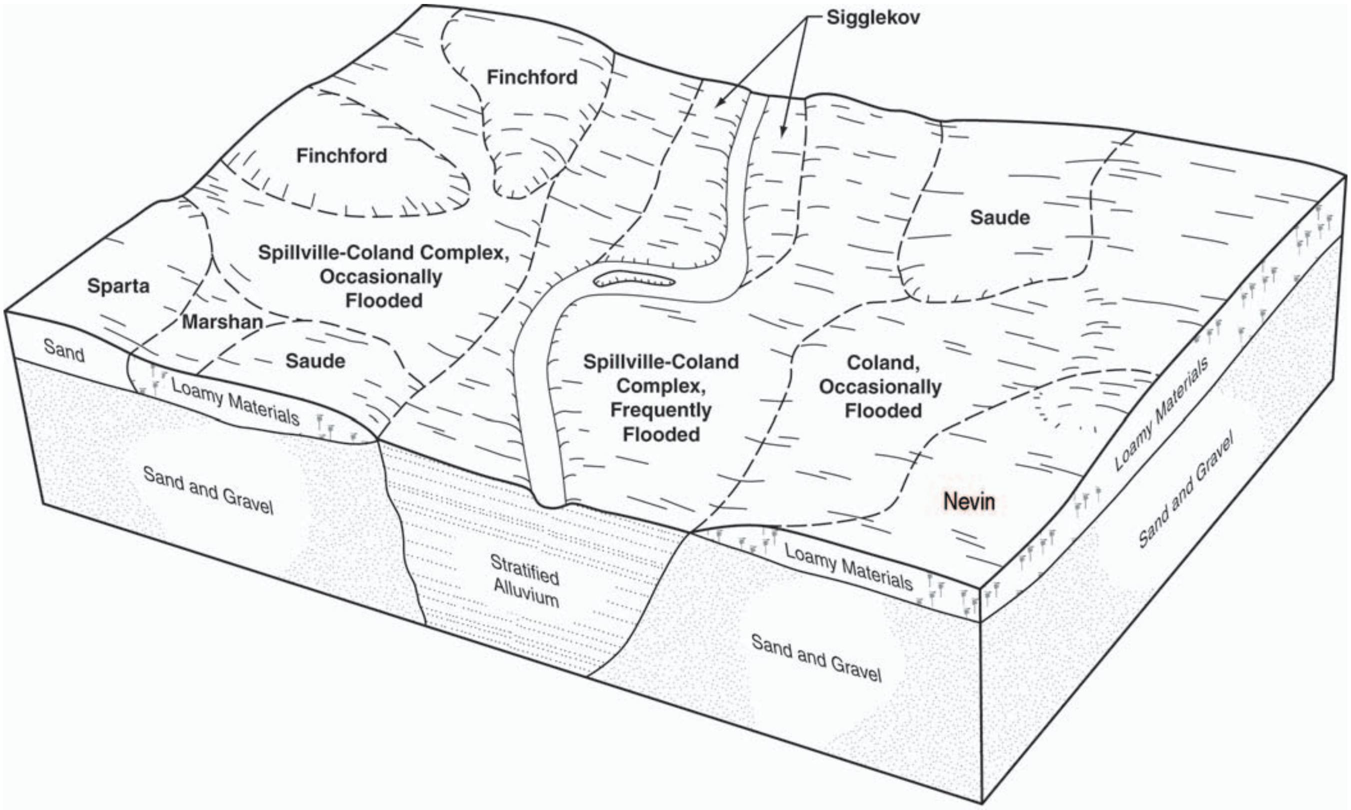

Figure 4.—Typical pattern of soils and parent material in the Coland-Spillville association.

7. Marquis-Clyde-Floyd Association (fig. 5)

Extent of the association in the survey area: 11 percent

Component Description

Marquis and similar soils

Extent: 43 to 53 percent of the mapped areas
Geomorphic setting: Uplands; hills
Position on the landform: Summits
Geomorphic component: Interfluves
Slope range: 2 to 5 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 2 feet (April)
Deepest depth to wet zone: 5 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.3 inches
Content of organic matter in the upper 10 inches: 3.5 percent

Clyde and similar soils

Extent: 18 to 28 percent of the mapped areas
Geomorphic setting: Drainageways on uplands
Slope range: 0 to 3 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Poorly drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: At the surface (April)
Deepest depth to wet zone: 3 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.7 inches
Content of organic matter in the upper 10 inches: 7 percent

Floyd and similar soils

Extent: 15 to 25 percent of the mapped areas
Geomorphic setting: Hills; uplands

Position on the landform: Footslopes
Geomorphic component: Base slopes
Slope range: 1 to 4 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Somewhat poorly drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 1 foot (April)
Deepest depth to wet zone: 4 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 10.7 inches
Content of organic matter in the upper 10 inches: 5.2 percent

Minor Dissimilar Components

Kenyon and similar soils

Extent: 1 to 11 percent of the mapped areas

Olin and similar soils

Extent: 0 to 8 percent of the mapped areas

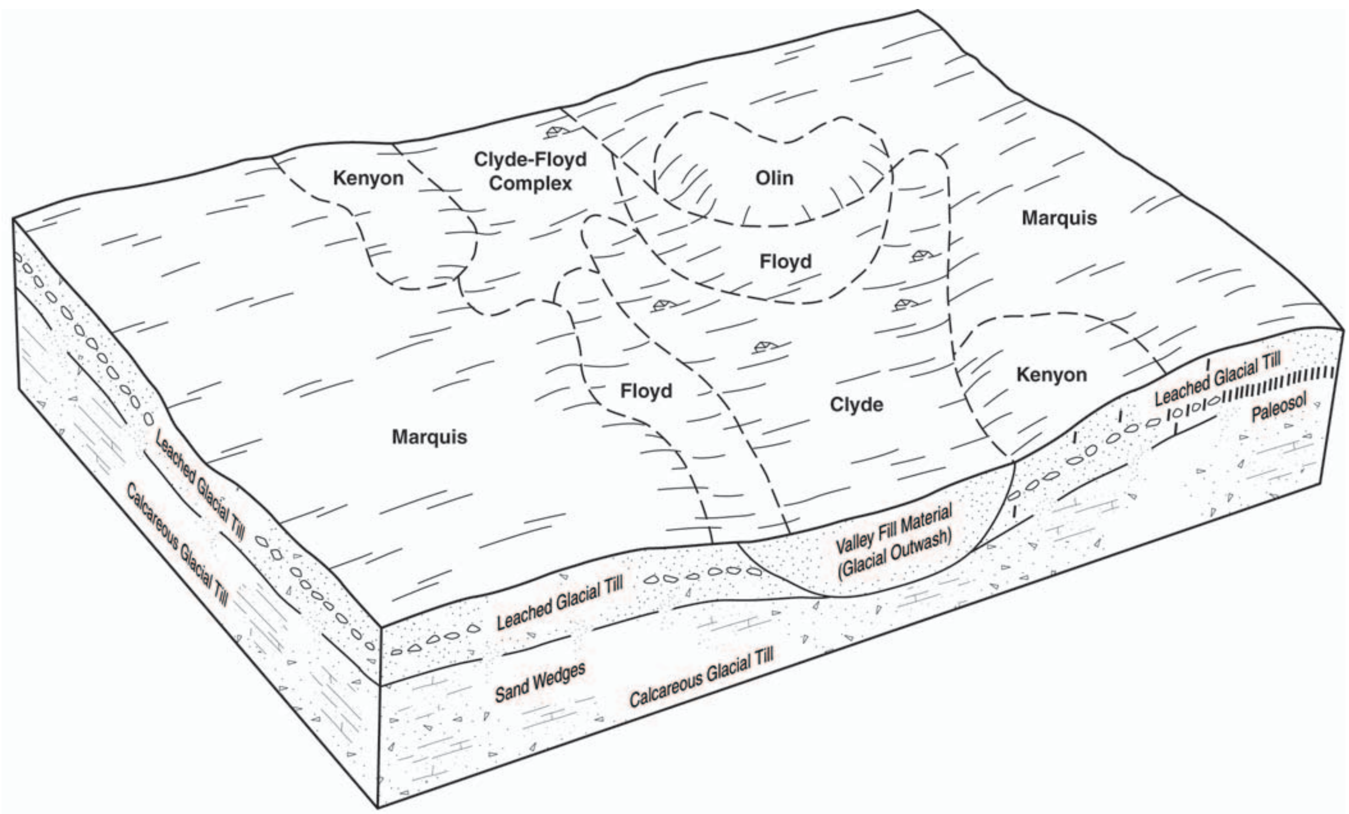

Figure 5.—Typical pattern of soils and parent material in the Marquis-Clyde-Floyd association.

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.

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, Kenyon loam, 2 to 5 percent slopes, is a phase of the Kenyon series.

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

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

Table 4 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.

7—Wiota silty clay loam, 0 to 2 percent slopes

Component Description

Wiota and similar soils

Extent: 70 to 90 percent of the mapped areas
Geomorphic setting: Stream terraces
Geomorphic component: Treads
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Alluvium
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 11.4 inches
Content of organic matter in the upper 10 inches: 3.6 percent

Minor Dissimilar Components

Nevin and similar soils

Extent: 0 to 20 percent of the mapped areas

Waukee and similar soils

Extent: 0 to 20 percent of the mapped areas

41—Sparta loamy fine sand, 0 to 2 percent slopes

Component Description

Sparta and similar soils

Extent: 80 to 100 percent of the mapped areas
Geomorphic setting: Stream terraces
Geomorphic component: Treads
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Excessively drained
Parent material: Eolian sands
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 4.7 inches
Content of organic matter in the upper 10 inches: 1.5 percent

Minor Dissimilar Components

Watseka and similar soils

Extent: 0 to 20 percent of the mapped areas

41B—Sparta loamy fine sand, 2 to 5 percent slopes

Component Description

Sparta and similar soils

Extent: 100 percent of the map unit
Geomorphic setting: Uplands; stream terraces
Position on the landform: Summits
Slope range: 2 to 5 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Excessively drained
Parent material: Eolian sands
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 4.7 inches
Content of organic matter in the upper 10 inches: 1.5 percent

41C—Sparta loamy fine sand, 5 to 9 percent slopes

Component Description

Sparta and similar soils

Extent: 100 percent of the map unit
Geomorphic setting: Hillsides; uplands
Position on the landform: Shoulders, backslopes
Geomorphic component: Interfluves
Slope range: 5 to 9 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Excessively drained
Parent material: Eolian sands
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None

Available water capacity to a depth of 60 inches: 4.7 inches
Content of organic matter in the upper 10 inches: 1.4 percent

41D—Sparta loamy fine sand, 9 to 14 percent slopes

Component Description

Sparta and similar soils

Extent: 100 percent of the map unit
Geomorphic setting: Hillsides; uplands
Position on the landform: Backslopes
Geomorphic component: Side slopes
Slope range: 9 to 14 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Excessively drained
Parent material: Eolian sands
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 4.6 inches
Content of organic matter in the upper 10 inches: 1.4 percent

63B—Chelsea loamy fine sand, 2 to 5 percent slopes

Component Description

Chelsea and similar soils

Extent: 85 to 95 percent of the mapped areas
Geomorphic setting: Stream terraces; uplands
Position on the landform: Summits
Slope range: 2 to 5 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Excessively drained
Parent material: Eolian sands
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 4.7 inches
Content of organic matter in the upper 10 inches: 0.9 percent

Minor Dissimilar Components

Billett and similar soils

Extent: 5 to 15 percent of the mapped areas

63C—Chelsea loamy fine sand, 5 to 9 percent slopes

Component Description

Chelsea and similar soils

Extent: 80 to 90 percent of the mapped areas
Geomorphic setting: Uplands; hillsides
Position on the landform: Shoulders, backslopes
Geomorphic component: Interfluves
Slope range: 5 to 9 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Excessively drained
Parent material: Eolian sands
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 4.7 inches
Content of organic matter in the upper 10 inches: 0.9 percent

Minor Dissimilar Components

Billett and similar soils

Extent: 10 to 20 percent of the mapped areas

63D—Chelsea loamy fine sand, 9 to 14 percent slopes

Component Description

Chelsea and similar soils

Extent: 85 to 95 percent of the mapped areas
Geomorphic setting: Hillsides; uplands
Position on the landform: Backslopes
Geomorphic component: Side slopes
Slope range: 9 to 14 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Excessively drained
Parent material: Eolian sands
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 4.7 inches
Content of organic matter in the upper 10 inches: 0.9 percent

Minor Dissimilar Components

Billett and similar soils

Extent: 5 to 15 percent of the mapped areas

83B—Kenyon loam, 2 to 5 percent slopes

Component Description

Kenyon and similar soils

Extent: 80 to 100 percent of the mapped areas
Geomorphic setting: Uplands; hills
Position on the landform: Summits
Geomorphic component: Interfluves
Slope range: 2 to 5 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 4 feet (April)
Deepest depth to wet zone: More than 6.7 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.3 inches
Content of organic matter in the upper 10 inches: 3.3 percent

Minor Dissimilar Components

Aredale and similar soils

Extent: 0 to 20 percent of the mapped areas

83C—Kenyon loam, 5 to 9 percent slopes

Component Description

Kenyon and similar soils

Extent: 70 to 90 percent of the mapped areas
Geomorphic setting: Uplands; hillsides
Position on the landform: Shoulders, backslopes
Geomorphic component: Interfluves
Slope range: 5 to 9 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 4 feet (April)
Deepest depth to wet zone: More than 6.7 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.3 inches
Content of organic matter in the upper 10 inches: 3.3 percent

Minor Dissimilar Components

Kenyon, moderately eroded, and similar soils

Extent: 0 to 20 percent of the mapped areas

Aredale and similar soils

Extent: 0 to 20 percent of the mapped areas

83C2—Kenyon loam, 5 to 9 percent slopes, moderately eroded

Component Description

Kenyon, moderately eroded, and similar soils

Extent: 65 to 85 percent of the mapped areas
Geomorphic setting: Uplands; hillsides
Position on the landform: Backslopes, shoulders
Geomorphic component: Interfluves
Slope range: 5 to 9 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 4 feet (April)
Deepest depth to wet zone: More than 6.7 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.2 inches
Content of organic matter in the upper 10 inches: 2.4 percent

Minor Dissimilar Components

Aredale, moderately eroded, and similar soils

Extent: 5 to 25 percent of the mapped areas

Kenyon and similar soils

Extent: 0 to 20 percent of the mapped areas

83D2—Kenyon loam, 9 to 14 percent slopes, moderately eroded

Component Description

Kenyon, moderately eroded, and similar soils

Extent: 80 to 100 percent of the mapped areas
Geomorphic setting: Uplands; hillsides
Position on the landform: Backslopes
Geomorphic component: Side slopes
Slope range: 9 to 14 percent

Depth to restrictive feature: More than 60 inches
Drainage class: Moderately well drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 4 feet (April)
Deepest depth to wet zone: More than 6.7 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.2 inches
Content of organic matter in the upper 10 inches: 2.4 percent

Minor Dissimilar Components

Kenyon and similar soils

Extent: 0 to 20 percent of the mapped areas

84—Clyde silty clay loam, 0 to 3 percent slopes

Component Description

Clyde and similar soils

Extent: 75 to 95 percent of the mapped areas
Geomorphic setting: Drainageways on uplands
Slope range: 0 to 3 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Poorly drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: At the surface (April)
Deepest depth to wet zone: 3 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.7 inches
Content of organic matter in the upper 10 inches: 7 percent

Minor Dissimilar Components

Floyd and similar soils

Extent: 5 to 25 percent of the mapped areas

88—Nevin silty clay loam, 0 to 2 percent slopes

Component Description

Nevin and similar soils

Extent: 60 to 80 percent of the mapped areas
Geomorphic setting: Stream terraces
Geomorphic component: Treads
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Somewhat poorly drained
Parent material: Alluvium
Months in which flooding does not occur: January, February, December
Highest frequency of flooding: Rare (March, April, May, June, July, August, September, October, November)
Shallowest depth to wet zone: 1 foot (April)
Deepest depth to wet zone: 4 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 12.1 inches
Content of organic matter in the upper 10 inches: 4.6 percent

Minor Dissimilar Components

Wiota and similar soils

Extent: 10 to 30 percent of the mapped areas

Colo, occasionally flooded, and similar soils

Extent: 0 to 20 percent of the mapped areas

133—Colo silty clay loam, 0 to 2 percent slopes, occasionally flooded

Component Description

Colo, occasionally flooded, and similar soils

Extent: 100 percent of the mapped areas
Geomorphic setting: Flood plains
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Poorly drained
Parent material: Alluvium
Months in which flooding does not occur: January, December
Highest frequency of flooding: Occasional (February, March, April, May, June, July, August, September, October, November)
Shallowest depth to wet zone: At the surface (April)
Deepest depth to wet zone: 3 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 12.6 inches
Content of organic matter in the upper 10 inches: 5.7 percent

135—Coland clay loam, 0 to 2 percent slopes, occasionally flooded

Component Description

Coland, occasionally flooded, and similar soils

Extent: 100 percent of the map unit
Geomorphic setting: Flood plains
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Poorly drained
Parent material: Alluvium
Months in which flooding does not occur: January, December
Highest frequency of flooding: Occasional (February, March, April, May, June, July, August, September, October, November)
Shallowest depth to wet zone: At the surface (April)
Deepest depth to wet zone: 3 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.4 inches
Content of organic matter in the upper 10 inches: 5.7 percent

159—Finchford loamy sand, 0 to 2 percent slopes

Component Description

Finchford and similar soils

Extent: 80 to 100 percent of the mapped areas
Geomorphic setting: Stream terraces
Geomorphic component: Treads
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Excessively drained
Parent material: Alluvium
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 3.5 inches
Content of organic matter in the upper 10 inches: 1.3 percent

Minor Dissimilar Components

Flagler and similar soils

Extent: 0 to 20 percent of the mapped areas

159C—Finchford loamy sand, 2 to 9 percent slopes

Component Description

Finchford and similar soils

Extent: 100 percent of the map unit
Geomorphic setting: Stream terraces
Geomorphic component: Risers
Slope range: 2 to 9 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Excessively drained
Parent material: Alluvium
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 3.2 inches
Content of organic matter in the upper 10 inches: 1.3 percent

171B—Bassett loam, 2 to 5 percent slopes

Component Description

Bassett and similar soils

Extent: 80 to 100 percent of the mapped areas
Geomorphic setting: Hills; uplands
Position on the landform: Summits
Geomorphic component: Interfluves
Slope range: 2 to 5 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 2 feet (April)
Deepest depth to wet zone: 5 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.1 inches
Content of organic matter in the upper 10 inches: 2.5 percent

Minor Dissimilar Components

Kenyon and similar soils

Extent: 0 to 20 percent of the mapped areas

175—Dickinson fine sandy loam, 0 to 2 percent slopes

Component Description

Dickinson and similar soils

Extent: 70 to 90 percent of the mapped areas
Geomorphic setting: Stream terraces
Geomorphic component: Treads
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Eolian sands
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 5.4 inches
Content of organic matter in the upper 10 inches: 2.4 percent

Minor Dissimilar Components

Finchford and similar soils

Extent: 0 to 20 percent of the mapped areas

Sparta and similar soils

Extent: 0 to 20 percent of the mapped areas

175B—Dickinson fine sandy loam, 2 to 5 percent slopes

Component Description

Dickinson and similar soils

Extent: 80 to 100 percent of the mapped areas
Geomorphic setting: Uplands; stream terraces
Position on the landform: Summits
Slope range: 2 to 5 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Eolian sands
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 5.4 inches
Content of organic matter in the upper 10 inches: 2 percent

Minor Dissimilar Components

Sparta and similar soils

Extent: 0 to 20 percent of the mapped areas

177—Saude loam, 0 to 2 percent slopes

Component Description

Saude and similar soils

Extent: 80 to 100 percent of the mapped areas
Geomorphic setting: Stream terraces
Geomorphic component: Treads
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Alluvium
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 6.5 inches
Content of organic matter in the upper 10 inches: 3.4 percent

Minor Dissimilar Components

Lawler soils that are 24 to 40 inches to sand and gravel

Extent: 0 to 20 percent of the mapped areas

177B—Saude loam, 2 to 5 percent slopes

Component Description

Saude and similar soils

Extent: 80 to 100 percent of the mapped areas
Geomorphic setting: Stream terraces
Geomorphic component: Treads
Slope range: 2 to 5 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Alluvium
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 6.5 inches

Content of organic matter in the upper 10 inches: 3.4 percent

Minor Dissimilar Components

Finchford and similar soils

Extent: 0 to 20 percent of the mapped areas

178—Waukee loam, 0 to 2 percent slopes

Component Description

Waukee and similar soils

Extent: 70 to 90 percent of the mapped areas
Geomorphic setting: Stream terraces
Geomorphic component: Treads
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Alluvium (fig. 6)
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 7.6 inches
Content of organic matter in the upper 10 inches: 3.3 percent

Minor Dissimilar Components

Saude and similar soils

Extent: 0 to 20 percent of the mapped areas

Wiota and similar soils

Extent: 0 to 20 percent of the mapped areas

178B—Waukee loam, 2 to 5 percent slopes

Component Description

Waukee and similar soils

Extent: 70 to 90 percent of the mapped areas
Geomorphic setting: Stream terraces
Geomorphic component: Treads
Slope range: 2 to 5 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Alluvium
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 7.6 inches
Content of organic matter in the upper 10 inches: 3.3 percent

Minor Dissimilar Components

Saude and similar soils

Extent: 0 to 20 percent of the mapped areas

Wiota and similar soils

Extent: 0 to 20 percent of the mapped areas

184—Klinger silty clay loam, 1 to 3 percent slopes

Component Description

Klinger and similar soils

Extent: 100 percent of the map unit
Geomorphic setting: Hills; uplands
Position on the landform: Summits
Geomorphic component: Interfluves
Slope range: 1 to 3 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Somewhat poorly drained
Parent material: Loess and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 1 foot (April)
Deepest depth to wet zone: 4 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.8 inches
Content of organic matter in the upper 10 inches: 5.4 percent

198B—Floyd loam, 1 to 4 percent slopes

Component Description

Floyd and similar soils

Extent: 80 to 100 percent of the mapped areas
Geomorphic setting: Uplands; hills
Position on the landform: Footslopes
Geomorphic component: Base slopes
Slope range: 1 to 4 percent
Depth to restrictive feature: Very deep (more than 60 inches)

Figure 6.—An area of Waukee loam in the Cedar River valley. Large, flat alluvial terraces stretch for miles along either side of the Cedar River.

Drainage class: Somewhat poorly drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 1 foot (April)
Deepest depth to wet zone: 4 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 10.7 inches
Content of organic matter in the upper 10 inches: 5.2 percent

Minor Dissimilar Components

Clyde and similar soils

Extent: 0 to 20 percent of the mapped areas

213B—Rockton loam, 30 to 40 inches to limestone, 2 to 5 percent slopes

Component Description

Rockton, 30 to 40 inches to limestone, and similar soils

Extent: 60 to 80 percent of the mapped areas
Geomorphic setting: Uplands; hills
Position on the landform: Shoulders, summits
Slope range: 2 to 5 percent
Depth to restrictive feature: 30 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy sediments and the underlying clayey residuum from limestone bedrock

Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 6.4 inches
Content of organic matter in the upper 10 inches: 3.5 percent

Minor Dissimilar Components

Atkinson and similar soils

Extent: 5 to 25 percent of the mapped areas

Emeline and similar soils

Extent: 5 to 25 percent of the mapped areas

221—Klossner muck, 1 to 3 percent slopes

Component Description

Klossner and similar soils

Extent: 100 percent of the map unit
Geomorphic setting: Fens; uplands
Position on the landform: Shoulders
Slope range: 1 to 3 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Very poorly drained
Parent material: Organic material overlying loamy deposits
Flooding: None
Wet zone: At the surface all year
Ponding: None
Available water capacity to a depth of 60 inches: 21.3 inches
Content of organic matter in the upper 10 inches: 75 percent

284—Flagler sandy loam, 0 to 2 percent slopes

Component Description

Flagler and similar soils

Extent: 70 to 90 percent of the mapped areas
Geomorphic setting: Stream terraces
Geomorphic component: Treads
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Somewhat excessively drained
Parent material: Alluvium
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 5 inches
Content of organic matter in the upper 10 inches: 1.9 percent

Minor Dissimilar Components

Finchford and similar soils

Extent: 0 to 20 percent of the mapped areas

Saude and similar soils

Extent: 0 to 20 percent of the mapped areas

284B—Flagler sandy loam, 2 to 5 percent slopes

Component Description

Flagler and similar soils

Extent: 80 to 100 percent of the mapped areas
Geomorphic setting: Stream terraces
Geomorphic component: Treads
Slope range: 2 to 5 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Somewhat excessively drained
Parent material: Alluvium
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 5 inches
Content of organic matter in the upper 10 inches: 1.9 percent

Minor Dissimilar Components

Finchford and similar soils

Extent: 0 to 20 percent of the mapped areas

290—Dells silt loam, 0 to 2 percent slopes

Component Description

Dells and similar soils

Extent: 80 to 100 percent of the mapped areas
Geomorphic setting: Stream terraces
Geomorphic component: Treads
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Somewhat poorly drained

Parent material: Loess and the underlying alluvium
Flooding: None
Shallowest depth to wet zone: 1 foot (April)
Deepest depth to wet zone: 4 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 9 inches
Content of organic matter in the upper 10 inches: 2.6 percent

Minor Dissimilar Components

Nevin and similar soils

Extent: 0 to 20 percent of the mapped areas

354—Aquolls, ponded, 0 to 1 percent slopes

Component Description

Aquolls, ponded, and similar soils

Extent: 80 to 100 percent of the mapped areas
Geomorphic setting: Depressions
Slope range: 0 to 1 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Very poorly drained
Parent material: Alluvium
Flooding: None
Wet zone: At the surface all year
Shallowest ponding: 0.5 foot (August, September, October)
Deepest ponding: 2 feet (April, May)

Minor Dissimilar Components

Marshan and similar soils

Extent: 0 to 20 percent of the mapped areas

377B—Dinsdale silty clay loam, 2 to 5 percent slopes

Component Description

Dinsdale and similar soils

Extent: 100 percent of the mapped areas
Geomorphic setting: Uplands; hills
Position on the landform: Summits
Geomorphic component: Interfluves
Slope range: 2 to 5 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Parent material: Loess and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 4 feet (April)
Deepest depth to wet zone: More than 6.7 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.6 inches
Content of organic matter in the upper 10 inches: 3.2 percent

377C—Dinsdale silty clay loam, 5 to 9 percent slopes

Component Description

Dinsdale and similar soils

Extent: 70 to 90 percent of the mapped areas
Geomorphic setting: Uplands; hillsides
Position on the landform: Backslopes, shoulders
Geomorphic component: Interfluves
Slope range: 5 to 9 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Parent material: Loess and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 4 feet (April)
Deepest depth to wet zone: More than 6.7 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.6 inches
Content of organic matter in the upper 10 inches: 3.2 percent

Minor Dissimilar Components

Dinsdale, moderately eroded, and similar soils

Extent: 10 to 30 percent of the mapped areas

377C2—Dinsdale silty clay loam, 5 to 9 percent slopes, moderately eroded

Component Description

Dinsdale, moderately eroded, and similar soils

Extent: 70 to 90 percent of the mapped areas
Geomorphic setting: Uplands; hillsides
Position on the landform: Backslopes, shoulders
Geomorphic component: Interfluves
Slope range: 5 to 9 percent
Depth to restrictive feature: Very deep (more than 60 inches)

Drainage class: Moderately well drained
Parent material: Loess and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 4 feet (April)
Deepest depth to wet zone: More than 6.7 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.3 inches
Content of organic matter in the upper 10 inches: 2.4 percent

Minor Dissimilar Components

Dinsdale and similar soils

Extent: 10 to 30 percent of the mapped areas

382—Maxfield silty clay loam, 0 to 2 percent slopes

Component Description

Maxfield and similar soils

Extent: 100 percent of the map unit
Geomorphic setting: Flats on uplands
Position on the landform: Summits
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Poorly drained
Parent material: Loess and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: At the surface (April)
Deepest depth to wet zone: 3 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.6 inches
Content of organic matter in the upper 10 inches: 6.4 percent

391B—Clyde-Floyd complex, 1 to 4 percent slopes

Component Description

Clyde and similar soils

Extent: 55 to 75 percent of the mapped areas
Geomorphic setting: Drainageways on uplands
Position on the landform: Footslopes
Slope range: 1 to 3 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Poorly drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: At the surface (April)
Deepest depth to wet zone: 3 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.7 inches
Content of organic matter in the upper 10 inches: 7 percent

Floyd and similar soils

Extent: 25 to 45 percent of the mapped areas
Geomorphic setting: Uplands; hills
Slope range: 1 to 4 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Somewhat poorly drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 1 foot (April)
Deepest depth to wet zone: 4 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 10.7 inches
Content of organic matter in the upper 10 inches: 5.2 percent

395B—Marquis loam, 2 to 5 percent slopes

Component Description

Marquis and similar soils

Extent: 80 to 90 percent of the mapped areas
Geomorphic setting: Hills; uplands
Position on the landform: Summits
Geomorphic component: Interfluves
Slope range: 2 to 5 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 2 feet (April)
Deepest depth to wet zone: 5 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.3 inches
Content of organic matter in the upper 10 inches: 3.5 percent

Minor Dissimilar Components

Kenyon and similar soils

Extent: 5 to 15 percent of the mapped areas

Aredale and similar soils

Extent: 0 to 10 percent of the mapped areas

398—Tripoli clay loam, 0 to 2 percent slopes

Component Description

Tripoli and similar soils

Extent: 80 to 100 percent of the mapped areas
Geomorphic setting: Flats on uplands
Position on the landform: Summits
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Poorly drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: At the surface (April)
Deepest depth to wet zone: 3 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.1 inches
Content of organic matter in the upper 10 inches: 6.4 percent

Minor Dissimilar Components

Readlyn and similar soils

Extent: 0 to 20 percent of the mapped areas

399—Readlyn loam, 1 to 3 percent slopes

Component Description

Readlyn and similar soils

Extent: 75 to 95 percent of the mapped areas
Geomorphic setting: Uplands; hills
Position on the landform: Summits
Geomorphic component: Interfluves
Slope range: 1 to 3 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Somewhat poorly drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 1 foot (April)
Deepest depth to wet zone: 4 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.3 inches
Content of organic matter in the upper 10 inches: 4.7 percent

Minor Dissimilar Components

Tripoli and similar soils

Extent: 5 to 25 percent of the mapped areas

408B—Olin fine sandy loam, 2 to 5 percent slopes

Component Description

Olin and similar soils

Extent: 70 to 90 percent of the mapped areas
Geomorphic setting: Hills; uplands
Position on the landform: Summits
Geomorphic component: Interfluves
Slope range: 2 to 5 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Sandy sediments and the underlying glacial till
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 9.5 inches
Content of organic matter in the upper 10 inches: 1.9 percent

Minor Dissimilar Components

Sparta and similar soils

Extent: 5 to 15 percent of the mapped areas

Kenyon and similar soils

Extent: 0 to 20 percent of the mapped areas

408C—Olin fine sandy loam, 5 to 9 percent slopes

Component Description

Olin and similar soils

Extent: 65 to 85 percent of the mapped areas
Geomorphic setting: Hillsides; uplands
Position on the landform: Shoulders, backslopes
Geomorphic component: Interfluves

Slope range: 5 to 9 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Sandy sediments and the underlying glacial till
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 9.5 inches
Content of organic matter in the upper 10 inches: 1.9 percent

Minor Dissimilar Components

Sparta and similar soils

Extent: 5 to 25 percent of the mapped areas

Kenyon and similar soils

Extent: 0 to 20 percent of the mapped areas

412C—Emeline loam, 2 to 9 percent slopes

Component Description

Emeline and similar soils

Extent: 65 to 85 percent of the mapped areas
Geomorphic setting: Uplands; hillsides
Position on the landform: Backslopes
Slope range: 2 to 9 percent
Depth to restrictive feature: 4 to 12 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material: Loamy sediments overlying limestone bedrock
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 1.8 inches
Content of organic matter in the upper 10 inches: 2.8 percent

Minor Dissimilar Components

Rockton soils that are 30 to 40 inches to limestone

Extent: 5 to 25 percent of the mapped areas

Rock outcrop

Extent: 0 to 20 percent of the mapped areas

426B—Aredale loam, 2 to 5 percent slopes

Component Description

Aredale and similar soils

Extent: 70 to 90 percent of the mapped areas
Geomorphic setting: Uplands; hills
Position on the landform: Summits
Geomorphic component: Interfluves
Slope range: 2 to 5 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 10 inches
Content of organic matter in the upper 10 inches: 3.2 percent

Minor Dissimilar Components

Kenyon and similar soils

Extent: 10 to 30 percent of the mapped areas

426C—Aredale loam, 5 to 9 percent slopes

Component Description

Aredale and similar soils

Extent: 65 to 85 percent of the mapped areas
Geomorphic setting: Uplands; hillsides
Position on the landform: Shoulders, backslopes
Geomorphic component: Interfluves
Slope range: 5 to 9 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 10 inches
Content of organic matter in the upper 10 inches: 3.2 percent

Minor Dissimilar Components

Kenyon and similar soils

Extent: 5 to 25 percent of the mapped areas

Aredale, moderately eroded, and similar soils

Extent: 0 to 20 percent of the mapped areas

426C2—Aredale loam, 5 to 9 percent slopes, moderately eroded

Component Description

Aredale, moderately eroded, and similar soils

Extent: 65 to 85 percent of the mapped areas
Geomorphic setting: Uplands; hillsides
Position on the landform: Shoulders, backslopes
Geomorphic component: Interfluves
Slope range: 5 to 9 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 9.9 inches
Content of organic matter in the upper 10 inches: 2.3 percent

Minor Dissimilar Components

Kenyon and similar soils

Extent: 5 to 25 percent of the mapped areas

Aredale and similar soils

Extent: 0 to 20 percent of the mapped areas

468B—Dunkerton sandy loam, 2 to 5 percent slopes

Component Description

Dunkerton and similar soils

Extent: 60 to 80 percent of the mapped areas
Geomorphic setting: Uplands; hills
Position on the landform: Summits
Geomorphic component: Interfluves
Slope range: 2 to 5 percent
Depth to restrictive feature: More than 60 inches
Drainage class: Somewhat poorly drained
Parent material: Sandy sediments and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 1 foot (April)
Deepest depth to wet zone: 4 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 9.8 inches
Content of organic matter in the upper 10 inches: 1 percent

Minor Dissimilar Components

Bassett and similar soils

Extent: 10 to 30 percent of the mapped areas

Olin and similar soils

Extent: 0 to 20 percent of the mapped areas

468C—Dunkerton sandy loam, 5 to 9 percent slopes

Component Description

Dunkerton and similar soils

Extent: 60 to 80 percent of the mapped areas
Geomorphic setting: Hillsides; uplands
Position on the landform: Shoulders, backslopes
Geomorphic component: Interfluves
Slope range: 5 to 9 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Somewhat poorly drained
Parent material: Sandy sediments and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 1 foot (April)
Deepest depth to wet zone: 4 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 9.8 inches
Content of organic matter in the upper 10 inches: 1 percent

Minor Dissimilar Components

Bassett and similar soils

Extent: 10 to 30 percent of the mapped areas

Sparta and similar soils

Extent: 0 to 20 percent of the mapped areas

471—Oran loam, 1 to 3 percent slopes

Component Description

Oran and similar soils

Extent: 75 to 95 percent of the mapped areas
Geomorphic setting: Uplands; hills
Position on the landform: Summits
Geomorphic component: Interfluves
Slope range: 1 to 3 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Somewhat poorly drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 1 foot (April)
Deepest depth to wet zone: 4 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11 inches
Content of organic matter in the upper 10 inches: 2.9 percent

Minor Dissimilar Components

Tripoli and similar soils

Extent: 5 to 25 percent of the mapped areas

485—Spillville loam, 0 to 2 percent slopes, occasionally flooded

Component Description

Spillville, occasionally flooded, and similar soils

Extent: 75 to 85 percent of the mapped areas
Geomorphic setting: Flood plains
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Somewhat poorly drained
Parent material: Alluvium
Months in which flooding does not occur: January, December
Highest frequency of flooding: Occasional (February, March, April, May, June, July, August, September, October, November)
Shallowest depth to wet zone: 1 foot (April)
Deepest depth to wet zone: 4 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.8 inches
Content of organic matter in the upper 10 inches: 4.1 percent

Minor Dissimilar Components

Coland, occasionally flooded, and similar soils

Extent: 0 to 20 percent of the mapped areas

Marshan soils that are 24 to 40 inches to sand and gravel

Extent: 0 to 15 percent of the mapped areas

585—Spillville-Coland complex, 0 to 2 percent slopes, occasionally flooded

Component Description

Spillville, occasionally flooded, and similar soils

Extent: 40 to 60 percent of the mapped areas
Geomorphic setting: Flood plains
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Somewhat poorly drained
Parent material: Alluvium
Months in which flooding does not occur: January, December
Highest frequency of flooding: Occasional (February, March, April, May, June, July, August, September, October, November)
Shallowest depth to wet zone: 1 foot (April)
Deepest depth to wet zone: 4 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.8 inches
Content of organic matter in the upper 10 inches: 4.1 percent

Coland, occasionally flooded, and similar soils

Extent: 20 to 40 percent of the mapped areas
Geomorphic setting: Flood plains
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Poorly drained
Parent material: Alluvium
Months in which flooding does not occur: January, December
Highest frequency of flooding: Occasional (February, March, April, May, June, July, August, September, October, November)
Shallowest depth to wet zone: At the surface (April)
Deepest depth to wet zone: 3 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.4 inches

Content of organic matter in the upper 10 inches: 5.7 percent

Minor Dissimilar Components

Marshan soils that are 24 to 40 inches to sand and gravel

Extent: 10 to 30 percent of the mapped areas

626—Hayfield loam, 24 to 40 inches to sand and gravel, 0 to 2 percent slopes

Component Description

Hayfield, 24 to 40 inches to sand and gravel, and similar soils

Extent: 70 to 90 percent of the mapped areas
Geomorphic setting: Stream terraces
Geomorphic component: Treads
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Somewhat poorly drained
Parent material: Alluvium
Flooding: None
Shallowest depth to wet zone: 1 foot (April)
Deepest depth to wet zone: 4 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 7 inches
Content of organic matter in the upper 10 inches: 2.9 percent

Minor Dissimilar Components

Nevin and similar soils

Extent: 0 to 20 percent of the mapped areas

Saude and similar soils

Extent: 0 to 20 percent of the mapped areas

761—Franklin silt loam, 1 to 3 percent slopes

Component Description

Franklin and similar soils

Extent: 100 percent of the map unit
Geomorphic setting: Hills; uplands
Position on the landform: Summits
Geomorphic component: Interfluves
Slope range: 1 to 3 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Somewhat poorly drained
Parent material: Loess and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 1 foot (April)
Deepest depth to wet zone: 4 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.4 inches
Content of organic matter in the upper 10 inches: 2.4 percent

771B—Waubeek silt loam, 2 to 5 percent slopes

Component Description

Waubeek and similar soils

Extent: 60 to 80 percent of the mapped areas
Geomorphic setting: Uplands; hills
Position on the landform: Summits
Geomorphic component: Interfluves
Slope range: 2 to 5 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Parent material: Loess and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 4 feet (April)
Deepest depth to wet zone: More than 6.7 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.5 inches
Content of organic matter in the upper 10 inches: 2.4 percent

Minor Dissimilar Components

Franklin and similar soils

Extent: 10 to 20 percent of the mapped areas

Billett and similar soils

Extent: 0 to 20 percent of the mapped areas

775B—Billett sandy loam, 2 to 5 percent slopes

Component Description

Billett and similar soils

Extent: 100 percent of the map unit
Geomorphic setting: Hills; uplands
Position on the landform: Summits

Geomorphic component: Interfluves
Slope range: 2 to 5 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Eolian sands
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 5.8 inches
Content of organic matter in the upper 10 inches: 1.3 percent

776C—Lilah sandy loam, 2 to 9 percent slopes

Component Description

Lilah and similar soils

Extent: 50 to 70 percent of the mapped areas
Geomorphic setting: Stream terraces
Geomorphic component: Treads
Slope range: 2 to 9 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Excessively drained
Parent material: Loamy sediments and the underlying gravels and sands
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 3.1 inches
Content of organic matter in the upper 10 inches: 1 percent

Minor Dissimilar Components

Burkhardt and similar soils

Extent: 10 to 30 percent of the mapped areas

Flagler and similar soils

Extent: 0 to 20 percent of the mapped areas

Dickinson and similar soils

Extent: 0 to 20 percent of the mapped areas

777—Wapsie loam, 1 to 3 percent slopes

Component Description

Wapsie and similar soils

Extent: 70 to 90 percent of the mapped areas
Geomorphic setting: Stream terraces
Geomorphic component: Treads
Slope range: 1 to 3 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Alluvium
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 6.3 inches
Content of organic matter in the upper 10 inches: 2.9 percent

Minor Dissimilar Components

Sattre and similar soils

Extent: 0 to 20 percent of the mapped areas

Hayfield soils that are 24 to 40 inches to sand and gravel

Extent: 0 to 20 percent of the mapped areas

781B—Lourdes loam, 2 to 5 percent slopes

Component Description

Lourdes and similar soils

Extent: 85 to 95 percent of the mapped areas
Geomorphic setting: Uplands; hills
Position on the landform: Summits
Geomorphic component: Interfluves
Slope range: 2 to 5 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 4 feet (April)
Deepest depth to wet zone: More than 6.7 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 9.9 inches
Content of organic matter in the upper 10 inches: 2.9 percent

Minor Dissimilar Components

Riceville and similar soils

Extent: 5 to 15 percent of the mapped areas

781C2—Lourdes loam, 5 to 9 percent slopes, moderately eroded

Component Description

Lourdes, moderately eroded, and similar soils

Extent: 90 to 100 percent of the mapped areas
Geomorphic setting: Hillsides; uplands
Position on the landform: Backslopes, shoulders
Geomorphic component: Interfluves
Slope range: 5 to 9 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 4 feet (April)
Deepest depth to wet zone: More than 6.7 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 9.8 inches
Content of organic matter in the upper 10 inches: 2.2 percent

Minor Dissimilar Components

Riceville and similar soils

Extent: 0 to 10 percent of the mapped areas

782B—Donnan loam, 2 to 5 percent slopes

Component Description

Donnan and similar soils

Extent: 70 to 90 percent of the mapped areas
Geomorphic setting: Uplands; hills
Position on the landform: Summits
Geomorphic component: Interfluves
Slope range: 2 to 5 percent
Depth to restrictive feature: More than 60 inches
Drainage class: Somewhat poorly drained
Parent material: Loamy sediments and the underlying clayey paleosol
Flooding: None
Shallowest depth to wet zone: 1 foot (April)
Deepest depth to wet zone: 4 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 10.1 inches
Content of organic matter in the upper 10 inches: 2.5 percent

Minor Dissimilar Components

Bassett and similar soils

Extent: 0 to 20 percent of the mapped areas

Oran and similar soils

Extent: 0 to 20 percent of the mapped areas

798—Protivin loam, 1 to 3 percent slopes

Component Description

Protivin and similar soils

Extent: 75 to 95 percent of the mapped areas
Geomorphic setting: Hills; uplands
Position on the landform: Summits
Geomorphic component: Interfluves
Slope range: 1 to 3 percent
Depth to restrictive feature: More than 60 inches
Drainage class: Somewhat poorly drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 1 foot (April)
Deepest depth to wet zone: 4 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 10.2 inches
Content of organic matter in the upper 10 inches: 6.4 percent

Minor Dissimilar Components

Readlyn and similar soils

Extent: 0 to 20 percent of the mapped areas

Donnan and similar soils

Extent: 0 to 10 percent of the mapped areas

809B—Bertram fine sandy loam, 2 to 5 percent slopes

Component Description

Bertram and similar soils

Extent: 65 to 85 percent of the mapped areas
Geomorphic setting: Hills; uplands
Position on the landform: Summits
Slope range: 2 to 5 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy sediments overlying limestone bedrock

Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 4.6 inches
Content of organic matter in the upper 10 inches: 2 percent

Minor Dissimilar Components

Atkinson and similar soils

Extent: 0 to 20 percent of the mapped areas

Emeline and similar soils

Extent: 0 to 20 percent of the mapped areas

Dickinson and similar soils

Extent: 0 to 10 percent of the mapped areas

877B—Dinsmore silty clay loam, 2 to 5 percent slopes

Component Description

Dinsmore and similar soils

Extent: 100 percent of the map unit
Geomorphic setting: Uplands; hills
Position on the landform: Summits
Geomorphic component: Interfluves
Slope range: 2 to 5 percent
Depth to restrictive feature: More than 60 inches
Drainage class: Moderately well drained
Parent material: Loess and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 4 feet (April)
Deepest depth to wet zone: More than 6.7 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.7 inches
Content of organic matter in the upper 10 inches: 3.3 percent

884—Klingmore silty clay loam, 1 to 3 percent slopes

Component Description

Klingmore and similar soils

Extent: 100 percent of the map unit
Geomorphic setting: Uplands; hills
Position on the landform: Summits
Geomorphic component: Interfluves
Slope range: 1 to 3 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Somewhat poorly drained
Parent material: Loess and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 1 foot (April)
Deepest depth to wet zone: 4 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 12.1 inches
Content of organic matter in the upper 10 inches: 5.3 percent

911B—Colo-Ely complex, 2 to 5 percent slopes

Component Description

Colo and similar soils

Extent: 50 to 70 percent of the mapped areas
Geomorphic setting: Drainageways on uplands
Slope range: 2 to 3 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Poorly drained
Parent material: Alluvium
Flooding: None
Shallowest depth to wet zone: At the surface (April)
Deepest depth to wet zone: 3 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 12.6 inches
Content of organic matter in the upper 10 inches: 5.7 percent

Ely and similar soils

Extent: 30 to 50 percent of the mapped areas
Geomorphic setting: Uplands; hills
Position on the landform: Footslopes
Geomorphic component: Base slopes
Slope range: 3 to 5 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Somewhat poorly drained
Parent material: Local alluvium
Flooding: None
Shallowest depth to wet zone: 1 foot (April)
Deepest depth to wet zone: 4 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 12.3 inches
Content of organic matter in the upper 10 inches: 5 percent

933—Sawmill silty clay loam, 0 to 2 percent slopes, occasionally flooded

Component Description

Sawmill, occasionally flooded, and similar soils

Extent: 80 to 100 percent of the mapped areas
Geomorphic setting: Flood plains
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Poorly drained
Parent material: Alluvium
Months in which flooding does not occur: January, December
Highest frequency of flooding: Occasional (February, March, April, May,
June, July, August, September, October, November)
Shallowest depth to wet zone: At the surface (April)
Deepest depth to wet zone: 3 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 12.3 inches
Content of organic matter in the upper 10 inches: 6 percent

Minor Dissimilar Components

Nevin and similar soils

Extent: 0 to 20 percent of the mapped areas

982—Maxmore silty clay loam, 0 to 2 percent slopes

Component Description

Maxmore and similar soils

Extent: 100 percent of the map unit
Geomorphic setting: Flats; uplands
Position on the landform: Summits
Geomorphic component: Interfluves
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Poorly drained
Parent material: Loess and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: At the surface (April)
Deepest depth to wet zone: 3 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.9 inches
Content of organic matter in the upper 10 inches: 6.6 percent

1152—Marshan clay loam, 24 to 40 inches to sand and gravel, 0 to 2 percent slopes

Component Description

Marshan, 24 to 40 inches to sand and gravel, and similar soils

Extent: 65 to 85 percent of the mapped areas
Geomorphic setting: Stream terraces
Geomorphic component: Treads
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Poorly drained
Parent material: Alluvium
Flooding: None
Shallowest depth to wet zone: At the surface (April)
Deepest depth to wet zone: 3 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 7 inches
Content of organic matter in the upper 10 inches: 5.5 percent

Minor Dissimilar Components

Coland, occasionally flooded, and similar soils

Extent: 10 to 20 percent of the mapped areas

Lawler soils that are 24 to 40 inches to sand and gravel

Extent: 5 to 10 percent of the mapped areas

Saude and similar soils

Extent: 0 to 5 percent of the mapped areas

1226—Lawler loam, 24 to 40 inches to sand and gravel, 0 to 2 percent slopes

Component Description

Lawler, 24 to 40 inches to sand and gravel, and similar soils

Extent: 65 to 75 percent of the mapped areas
Geomorphic setting: Stream terraces
Geomorphic component: Treads
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Somewhat poorly drained
Parent material: Alluvium
Flooding: None
Shallowest depth to wet zone: 1 foot (April)

Deepest depth to wet zone: 4 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 7.8 inches
Content of organic matter in the upper 10 inches: 4.3 percent

Minor Dissimilar Components

Waukee and similar soils

Extent: 5 to 15 percent of the mapped areas

Marshan, 24 to 40 inches to sand and gravel, and similar soils

Extent: 0 to 20 percent of the mapped areas

Nevin and similar soils

Extent: 5 to 15 percent of the mapped areas

1285G—Burkhardt-Bassett-Chelsea complex, 18 to 60 percent slopes

Component Description

Burkhardt and similar soils

Extent: 30 to 50 percent of the mapped areas
Geomorphic setting: Hillsides; uplands
Position on the landform: Backslopes
Slope range: 18 to 60 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Somewhat excessively drained
Parent material: Alluvium and outwash
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 4.1 inches
Content of organic matter in the upper 10 inches: 1.5 percent

Bassett and similar soils

Extent: 25 to 45 percent of the mapped areas
Geomorphic setting: Uplands; hillsides
Position on the landform: Backslopes
Slope range: 18 to 60 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 2 feet (April)
Deepest depth to wet zone: 5 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.1 inches
Content of organic matter in the upper 10 inches: 1.9 percent

Chelsea and similar soils

Extent: 10 to 30 percent of the mapped areas
Geomorphic setting: Uplands; hillsides
Position on the landform: Backslopes
Slope range: 18 to 60 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Excessively drained
Parent material: Eolian sands
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 4.4 inches
Content of organic matter in the upper 10 inches: 0.6 percent

Minor Dissimilar Components

Emeline and similar soils

Extent: 0 to 10 percent of the mapped areas

1585—Spillville-Coland, channeled-Aquolls, ponded, complex, 0 to 2 percent slopes, frequently flooded (fig. 7)

Component Description

Spillville, frequently flooded, and similar soils

Extent: 35 to 45 percent of the mapped areas
Geomorphic setting: Flood plains
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Somewhat poorly drained
Parent material: Alluvium
Months in which flooding does not occur: January, December
Highest frequency of flooding: Frequent (February, March, April, May, June, July, August, September, October, November)
Shallowest depth to wet zone: 1 foot (April)
Deepest depth to wet zone: 4 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.8 inches

Figure 7.—An area of Spillville-Coland, channeled-Aquolls, ponded, complex, frequently flooded, along the Cedar River north of Cedar Falls. Flooding occurs nearly every year in this area, depositing new sediment and slightly changing the appearance of the flood plain.

Content of organic matter in the upper 10 inches: 4 percent

Coland, frequently flooded, and similar soils

Extent: 25 to 45 percent of the mapped areas
Geomorphic setting: Flood plains
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Poorly drained
Parent material: Alluvium
Months in which flooding does not occur: January, December
Highest frequency of flooding: Frequent (February, March, April, May, June, July, August, September, October, November)
Shallowest depth to wet zone: At the surface (April)
Deepest depth to wet zone: 3 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.4 inches
Content of organic matter in the upper 10 inches: 4.5 percent

Aquolls, ponded, and similar soils

Extent: 5 to 25 percent of the mapped areas
Geomorphic setting: Oxbows on flood plains
Slope range: 0 to 1 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Very poorly drained
Flooding: None
Wet zone: At the surface all year
Shallowest ponding: 0.5 foot (August, September, October)
Deepest ponding: 2 feet (April, May)

Minor Dissimilar Components

Marshan, 24 to 40 inches to sand and gravel, and similar soils

Extent: 5 to 15 percent of the mapped areas

1586—Sigglekov-Fluvaquents, channeled-Aquents, ponded, complex, 0 to 2 percent slopes, frequently flooded

Component Description

Sigglekov, frequently flooded, and similar soils

Extent: 45 to 65 percent of the mapped areas
Geomorphic setting: Flood plains
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Somewhat poorly drained
Parent material: Alluvium
Months in which flooding does not occur: January, December
Highest frequency of flooding: Frequent (February, March, April, May, June, July, August, September, October, November)
Shallowest depth to wet zone: 1 foot (April)
Deepest depth to wet zone: 4 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 2.8 inches
Content of organic matter in the upper 10 inches: 0.9 percent

Fluvaquents, frequently flooded, and similar soils

Extent: 20 to 40 percent of the mapped areas
Geomorphic setting: Flood plains
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Very poorly drained
Parent material: Alluvium
Months in which flooding does not occur: January, December
Highest frequency of flooding: Frequent (February, March, April, May, June, July, August, September, October, November)
Shallowest depth to wet zone: At the surface (April)
Deepest depth to wet zone: 3 feet (September)
Ponding: None

Aquents, ponded, and similar soils

Extent: 5 to 25 percent of the mapped areas
Geomorphic setting: Oxbows on flood plains
Slope range: 0 to 1 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Very poorly drained
Flooding: None
Wet zone: At the surface all year
Shallowest ponding: 0.5 foot (August, September, October)
Deepest ponding: 2 feet (April, May)

4000—Urban land

• This map unit consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.

4007—Wiota-Urban land complex, 0 to 2 percent slopes

Component Description

Wiota and similar soils

Extent: 30 to 50 percent of the mapped areas
Geomorphic setting: Stream terraces
Geomorphic component: Treads
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Alluvium
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 11.4 inches
Content of organic matter in the upper 10 inches: 3.6 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 30 to 50 percent of the mapped areas

Minor Dissimilar Components

Nevin and similar soils

Extent: 0 to 20 percent of the mapped areas

Waukee and similar soils

Extent: 0 to 20 percent of the mapped areas

4041—Sparta-Urban land complex, 0 to 2 percent slopes

Component Description

Sparta and similar soils

Extent: 35 to 55 percent of the mapped areas
Geomorphic setting: Stream terraces
Geomorphic component: Treads
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Excessively drained
Parent material: Eolian sands
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 4.7 inches
Content of organic matter in the upper 10 inches: 1.5 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 35 to 55 percent of the mapped areas

Minor Dissimilar Components

Watseka and similar soils

Extent: 0 to 20 percent of the mapped areas

4041B—Sparta-Urban land complex, 2 to 5 percent slopes

Component Description

Sparta and similar soils

Extent: 40 to 60 percent of the mapped areas
Geomorphic setting: Uplands; stream terraces
Position on the landform: Summits
Slope range: 2 to 5 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Excessively drained
Parent material: Eolian sands
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 4.7 inches
Content of organic matter in the upper 10 inches: 1.5 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 40 to 60 percent of the mapped areas

4041C—Sparta-Urban land complex, 5 to 9 percent slopes

Component Description

Sparta and similar soils

Extent: 40 to 60 percent of the mapped areas
Geomorphic setting: Hillsides; uplands
Position on the landform: Shoulders, backslopes
Geomorphic component: Interfluves
Slope range: 5 to 9 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Excessively drained
Parent material: Eolian sands
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 4.7 inches
Content of organic matter in the upper 10 inches: 1.4 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 40 to 60 percent of the mapped areas

4041D—Sparta-Urban land complex, 9 to 14 percent slopes

Component Description

Sparta and similar soils

Extent: 40 to 60 percent of the mapped areas

Geomorphic setting: Hillsides; uplands
Position on the landform: Backslopes
Geomorphic component: Side slopes
Slope range: 9 to 14 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Excessively drained
Parent material: Eolian sands
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 4.6 inches
Content of organic matter in the upper 10 inches: 1.4 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 40 to 60 percent of the mapped areas

4063B—Chelsea-Urban land complex, 2 to 5 percent slopes

Component Description

Chelsea and similar soils

Extent: 35 to 55 percent of the mapped areas
Geomorphic setting: Stream terraces; uplands
Position on the landform: Summits
Slope range: 2 to 5 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Excessively drained
Parent material: Eolian sands
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 4.7 inches
Content of organic matter in the upper 10 inches: 0.9 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 35 to 55 percent of the mapped areas

Minor Dissimilar Components

Billett and similar soils

Extent: 5 to 15 percent of the mapped areas

4063C—Chelsea-Urban land complex, 5 to 9 percent slopes

Component Description

Chelsea and similar soils

Extent: 35 to 55 percent of the mapped areas
Geomorphic setting: Uplands; hillsides
Position on the landform: Shoulders, backslopes
Geomorphic component: Interfluves
Slope range: 5 to 9 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Excessively drained
Parent material: Eolian sands
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 4.7 inches
Content of organic matter in the upper 10 inches: 0.9 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 30 to 50 percent of the mapped areas

Minor Dissimilar Components

Billett and similar soils

Extent: 10 to 20 percent of the mapped areas

4063D—Chelsea-Urban land complex, 9 to 14 percent slopes

Component Description

Chelsea and similar soils

Extent: 35 to 55 percent of the mapped areas
Geomorphic setting: Uplands; hillsides
Position on the landform: Backslopes
Geomorphic component: Side slopes
Slope range: 9 to 14 percent

Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Excessively drained
Parent material: Eolian sands
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 4.7 inches
Content of organic matter in the upper 10 inches: 0.9 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 35 to 55 percent of the mapped areas

Minor Dissimilar Components

Billett and similar soils

Extent: 5 to 15 percent of the mapped areas

4083B—Kenyon-Urban land complex, 2 to 5 percent slopes

Component Description

Kenyon and similar soils

Extent: 35 to 55 percent of the mapped areas
Geomorphic setting: Uplands; hills
Position on the landform: Summits
Geomorphic component: Interfluves
Slope range: 2 to 5 percent
Depth to restrictive feature: More than 60 inches
Drainage class: Moderately well drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 4 feet (April)
Deepest depth to wet zone: More than 6.7 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.3 inches
Content of organic matter in the upper 10 inches: 3.3 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 35 to 55 percent of the mapped areas

Minor Dissimilar Components

Aredale and similar soils

Extent: 0 to 20 percent of the mapped areas

4083C—Kenyon-Urban land complex, 5 to 9 percent slopes

Component Description

Kenyon and similar soils

Extent: 35 to 55 percent of the mapped areas
Geomorphic setting: Uplands; hillsides
Position on the landform: Backslopes, shoulders
Geomorphic component: Interfluves
Slope range: 5 to 9 percent
Depth to restrictive feature: More than 60 inches
Drainage class: Moderately well drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 4 feet (April)
Deepest depth to wet zone: More than 6.7 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.3 inches
Content of organic matter in the upper 10 inches: 3.3 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 35 to 55 percent of the mapped areas

Minor Dissimilar Components

Aredale and similar soils

Extent: 0 to 20 percent of the mapped areas

4083D—Kenyon-Urban land complex, 9 to 14 percent slopes

Component Description

Kenyon and similar soils

Extent: 35 to 55 percent of the mapped areas

Geomorphic setting: Uplands; hillsides
Position on the landform: Backslopes, shoulders
Geomorphic component: Side slopes
Slope range: 9 to 14 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 4 feet (April)
Deepest depth to wet zone: More than 6.7 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.3 inches
Content of organic matter in the upper 10 inches: 3.3 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 35 to 55 percent of the mapped areas

Minor Dissimilar Components

Aredale and similar soils

Extent: 0 to 20 percent of the mapped areas

4084—Clyde-Urban land complex, 0 to 3 percent slopes

Component Description

Clyde and similar soils

Extent: 35 to 55 percent of the mapped areas
Geomorphic setting: Drainageways on uplands
Slope range: 0 to 3 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Poorly drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: At the surface (April)
Deepest depth to wet zone: 3 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.7 inches
Content of organic matter in the upper 10 inches: 7 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 30 to 50 percent of the mapped areas

Minor Dissimilar Components

Floyd and similar soils

Extent: 5 to 25 percent of the mapped areas

4088—Nevin-Urban land complex, 0 to 2 percent slopes

Component Description

Nevin and similar soils

Extent: 25 to 45 percent of the mapped areas
Geomorphic setting: Stream terraces
Geomorphic component: Treads
Slope range: 0 to 2 percent
Depth to restrictive feature: More than 60 inches
Drainage class: Somewhat poorly drained
Parent material: Alluvium
Months in which flooding does not occur: January, February, December
Highest frequency of flooding: Rare (March, April, May, June, July, August, September, October, November)
Shallowest depth to wet zone: 1 foot (April)
Deepest depth to wet zone: 4 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 12.1 inches
Content of organic matter in the upper 10 inches: 4.6 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 25 to 45 percent of the mapped areas

Minor Dissimilar Components

Wiota and similar soils

Extent: 10 to 30 percent of the mapped areas

Colo, occasionally flooded, and similar soils

Extent: 0 to 20 percent of the mapped areas

4133—Colo, occasionally flooded-Urban land complex, 0 to 2 percent slopes

Component Description

Colo, occasionally flooded, and similar soils

Extent: 40 to 60 percent of the mapped areas
Geomorphic setting: Flood plains
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Poorly drained
Parent material: Alluvium
Months in which flooding does not occur: January, December
Highest frequency of flooding: Occasional (February, March, April, May, June, July, August, September, October, November)
Shallowest depth to wet zone: At the surface (April)
Deepest depth to wet zone: 3 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 12.6 inches
Content of organic matter in the upper 10 inches: 5.7 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 40 to 60 percent of the mapped areas

4135—Coland, occasionally flooded-Urban land complex, 0 to 2 percent slopes

Component Description

Coland, occasionally flooded, and similar soils

Extent: 40 to 60 percent of the mapped areas
Geomorphic setting: Flood plains
Slope range: 0 to 2 percent
Depth to restrictive feature: More than 60 inches
Drainage class: Poorly drained
Parent material: Alluvium
Months in which flooding does not occur: January, December
Highest frequency of flooding: Occasional (February, March, April, May, June, July, August, September, October, November)
Shallowest depth to wet zone: At the surface (April)
Deepest depth to wet zone: 3 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.4 inches
Content of organic matter in the upper 10 inches: 5.7 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 40 to 60 percent of the mapped areas

4152—Marshan-Urban land complex, 0 to 2 percent slopes

Component Description

Marshan, 24 to 40 inches to sand and gravel, and similar soils

Extent: 30 to 50 percent of the mapped areas
Geomorphic setting: Stream terraces
Geomorphic component: Treads
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Poorly drained
Parent material: Alluvium
Flooding: None
Shallowest depth to wet zone: At the surface (April)
Deepest depth to wet zone: 3 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 7 inches
Content of organic matter in the upper 10 inches: 5.5 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 25 to 45 percent of the mapped areas

Minor Dissimilar Components

Coland, occasionally flooded, and similar soils

Extent: 10 to 20 percent of the mapped areas

Lawler soils that are 24 to 40 inches to sand and gravel

Extent: 5 to 10 percent of the mapped areas

Saude and similar soils

Extent: 0 to 5 percent of the mapped areas

4159—Finchford-Urban land complex, 0 to 2 percent slopes

Component Description

Finchford and similar soils

Extent: 35 to 55 percent of the mapped areas
Geomorphic setting: Stream terraces
Geomorphic component: Treads
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Excessively drained
Parent material: Alluvium
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 3.5 inches
Content of organic matter in the upper 10 inches: 1.3 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 35 to 55 percent of the mapped areas

Minor Dissimilar Components

Flagler and similar soils

Extent: 0 to 20 percent of the mapped areas

4159C—Finchford-Urban land complex, 2 to 9 percent slopes

Component Description

Finchford and similar soils

Extent: 40 to 60 percent of the mapped areas
Geomorphic setting: Stream terraces
Geomorphic component: Risers
Slope range: 2 to 9 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Excessively drained
Parent material: Alluvium
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 3.2 inches
Content of organic matter in the upper 10 inches: 1.3 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 40 to 60 percent of the mapped areas

4171B—Bassett-Urban land complex, 2 to 5 percent slopes

Component Description

Bassett and similar soils

Extent: 35 to 55 percent of the mapped areas
Geomorphic setting: Hills; uplands
Position on the landform: Summits
Geomorphic component: Interfluves
Slope range: 2 to 5 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 2 feet (April)
Deepest depth to wet zone: 5 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.1 inches
Content of organic matter in the upper 10 inches: 2.5 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 35 to 55 percent of the mapped areas

Minor Dissimilar Components

Kenyon and similar soils

Extent: 0 to 20 percent of the mapped areas

4171D—Bassett-Urban land complex, 5 to 14 percent slopes

Component Description

Bassett and similar soils

Extent: 40 to 60 percent of the mapped areas
Geomorphic setting: Hillsides; uplands
Position on the landform: Summits
Geomorphic component: Side slopes
Slope range: 5 to 14 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 2 feet (April)
Deepest depth to wet zone: 5 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.1 inches
Content of organic matter in the upper 10 inches: 2.5 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 35 to 55 percent of the mapped areas

Minor Dissimilar Components

Kenyon and similar soils

Extent: 0 to 10 percent of the mapped areas

4175—Dickinson-Urban land complex, 0 to 2 percent slopes

Component Description

Dickinson and similar soils

Extent: 30 to 50 percent of the mapped areas
Geomorphic setting: Stream terraces
Geomorphic component: Treads
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Eolian sands
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 5.4 inches
Content of organic matter in the upper 10 inches: 2.4 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 30 to 50 percent of the mapped areas

Minor Dissimilar Components

Sparta and similar soils

Extent: 0 to 20 percent of the mapped areas

Finchford and similar soils

Extent: 0 to 20 percent of the mapped areas

4175B—Dickinson-Urban land complex, 2 to 5 percent slopes

Component Description

Dickinson and similar soils

Extent: 35 to 55 percent of the mapped areas
Geomorphic setting: Stream terraces; uplands
Position on the landform: Summits
Slope range: 2 to 5 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Eolian sands
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 5.4 inches
Content of organic matter in the upper 10 inches: 2 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other

structures. The original soils can no longer be identified.
Extent: 35 to 55 percent of the mapped areas

Minor Dissimilar Components

Sparta and similar soils

Extent: 0 to 20 percent of the mapped areas

4177—Saude-Urban land complex, 0 to 2 percent slopes

Component Description

Saude and similar soils

Extent: 35 to 55 percent of the mapped areas
Geomorphic setting: Stream terraces
Geomorphic component: Treads
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Alluvium
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 6.5 inches
Content of organic matter in the upper 10 inches: 3.4 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 35 to 55 percent of the mapped areas

Minor Dissimilar Components

Lawler soils that are 24 to 40 inches to sand and gravel

Extent: 0 to 20 percent of the mapped areas

4177B—Saude-Urban land complex, 2 to 5 percent slopes

Component Description

Saude and similar soils

Extent: 35 to 55 percent of the mapped areas
Geomorphic setting: Stream terraces
Geomorphic component: Treads
Slope range: 2 to 5 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Alluvium
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 6.5 inches
Content of organic matter in the upper 10 inches: 3.4 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 35 to 55 percent of the mapped areas

Minor Dissimilar Components

Finchford and similar soils

Extent: 0 to 20 percent of the mapped areas

4178—Waukee-Urban land complex, 0 to 2 percent slopes

Component Description

Waukee and similar soils

Extent: 30 to 50 percent of the mapped areas
Geomorphic setting: Stream terraces
Geomorphic component: Treads
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Alluvium
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 7.6 inches
Content of organic matter in the upper 10 inches: 3.3 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.

Extent: 30 to 50 percent of the mapped areas

Minor Dissimilar Components

Wiota and similar soils

Extent: 0 to 20 percent of the mapped areas

Saude and similar soils

Extent: 0 to 20 percent of the mapped areas

4184—Klinger-Urban land complex, 1 to 3 percent slopes

Component Description

Klinger and similar soils

Extent: 40 to 60 percent of the mapped areas
Geomorphic setting: Uplands; hills
Position on the landform: Summits
Geomorphic component: Interfluves
Slope range: 1 to 3 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Somewhat poorly drained
Parent material: Loess and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 1 foot (April)
Deepest depth to wet zone: 4 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.8 inches
Content of organic matter in the upper 10 inches: 5.4 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 40 to 60 percent of the mapped areas

4198B—Floyd-Urban land complex, 1 to 4 percent slopes

Component Description

Floyd and similar soils

Extent: 35 to 55 percent of the mapped areas
Geomorphic setting: Hills; uplands
Position on the landform: Footslopes
Geomorphic component: Base slopes
Slope range: 1 to 4 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Somewhat poorly drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 1 foot (April)
Deepest depth to wet zone: 4 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 10.7 inches
Content of organic matter in the upper 10 inches: 5.2 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 35 to 55 percent of the mapped areas

Minor Dissimilar Components

Clyde and similar soils

Extent: 0 to 20 percent of the mapped areas

4226—Lawler-Urban land complex, 0 to 2 percent slopes

Component Description

Lawler, 24 to 40 inches to sand and gravel, and similar soils

Extent: 25 to 45 percent of the mapped areas
Geomorphic setting: Stream terraces
Geomorphic component: Treads
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Somewhat poorly drained
Parent material: Alluvium
Flooding: None
Shallowest depth to wet zone: 1 foot (April)
Deepest depth to wet zone: 4 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 7.8 inches
Content of organic matter in the upper 10 inches: 4.3 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets,

parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 25 to 45 percent of the mapped areas

Minor Dissimilar Components

Waukee and similar soils

Extent: 5 to 15 percent of the mapped areas

Marshan soils that are 24 to 40 inches to sand and gravel

Extent: 0 to 20 percent of the mapped areas

Nevin and similar soils

Extent: 5 to 15 percent of the mapped areas

4284—Flagler-Urban land complex, 0 to 2 percent slopes

Component Description

Flagler and similar soils

Extent: 30 to 50 percent of the mapped areas
Geomorphic setting: Stream terraces
Geomorphic component: Treads
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Somewhat excessively drained
Parent material: Alluvium
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 5 inches
Content of organic matter in the upper 10 inches: 1.9 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 30 to 50 percent of the mapped areas

Minor Dissimilar Components

Saude and similar soils

Extent: 0 to 20 percent of the mapped areas

Finchford and similar soils

Extent: 0 to 20 percent of the mapped areas

4284B—Flagler-Urban land complex, 2 to 5 percent slopes

Component Description

Flagler and similar soils

Extent: 35 to 55 percent of the mapped areas
Geomorphic setting: Stream terraces
Geomorphic component: Treads
Slope range: 2 to 5 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Somewhat excessively drained
Parent material: Alluvium
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 5 inches
Content of organic matter in the upper 10 inches: 1.9 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 35 to 55 percent of the mapped areas

Minor Dissimilar Components

Finchford and similar soils

Extent: 0 to 20 percent of the mapped areas

4377B—Dinsdale-Urban land complex, 2 to 5 percent slopes

Component Description

Dinsdale and similar soils

Extent: 40 to 60 percent of the mapped areas
Geomorphic setting: Hills; uplands
Position on the landform: Summits
Geomorphic component: Interfluves
Slope range: 2 to 5 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Parent material: Loess and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 4 feet (April)
Deepest depth to wet zone: More than 6.7 feet (September)

Ponding: None
Available water capacity to a depth of 60 inches: 11.6 inches
Content of organic matter in the upper 10 inches: 3.2 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 40 to 60 percent of the mapped areas

4377C—Dinsdale-Urban land complex, 5 to 9 percent slopes

Component Description

Dinsdale and similar soils

Extent: 40 to 60 percent of the mapped areas
Geomorphic setting: Hillsides; uplands
Position on the landform: Shoulders, backslopes
Geomorphic component: Interfluves
Slope range: 5 to 9 percent
Depth to restrictive feature: More than 60 inches
Drainage class: Moderately well drained
Parent material: Loess and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 4 feet (April)
Deepest depth to wet zone: More than 6.7 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.6 inches
Content of organic matter in the upper 10 inches: 3.2 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 40 to 60 percent of the mapped areas

4382—Maxfield-Urban land complex, 0 to 2 percent slopes

Component Description

Maxfield and similar soils

Extent: 40 to 60 percent of the mapped areas
Geomorphic setting: Flats on uplands
Position on the landform: Summits
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Poorly drained
Parent material: Loess and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: At the surface (April)
Deepest depth to wet zone: 3 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.6 inches
Content of organic matter in the upper 10 inches: 6.4 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 40 to 60 percent of the mapped areas

4391B—Clyde-Floyd-Urban land complex, 1 to 4 percent slopes

Component Description

Clyde and similar soils

Extent: 30 to 40 percent of the mapped areas
Geomorphic setting: Drainageways on uplands
Slope range: 1 to 3 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Poorly drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: At the surface (April)
Deepest depth to wet zone: 3 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.7 inches
Content of organic matter in the upper 10 inches: 7 percent

Floyd and similar soils

Extent: 30 to 40 percent of the mapped areas
Geomorphic setting: Hills on uplands
Slope range: 1 to 4 percent
Depth to restrictive feature: Very deep (more than 60 inches)

Drainage class: Somewhat poorly drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 1 foot (April)
Deepest depth to wet zone: 4 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 10.7 inches
Content of organic matter in the upper 10 inches: 5.2 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 20 to 40 percent of the mapped areas

4398—Tripoli-Urban land complex, 0 to 2 percent slopes

Component Description

Tripoli and similar soils

Extent: 35 to 55 percent of the mapped areas
Geomorphic setting: Flats on uplands
Position on the landform: Summits
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Poorly drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: At the surface (April)
Deepest depth to wet zone: 3 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.1 inches
Content of organic matter in the upper 10 inches: 6.4 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 35 to 55 percent of the mapped areas

Minor Dissimilar Components

Readlyn and similar soils

Extent: 0 to 20 percent of the mapped areas

4399—Readlyn-Urban land complex, 1 to 3 percent slopes

Component Description

Readlyn and similar soils

Extent: 35 to 55 percent of the mapped areas
Geomorphic setting: Hills; uplands
Position on the landform: Summits
Geomorphic component: Interfluves
Slope range: 1 to 3 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Somewhat poorly drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 1 foot (April)
Deepest depth to wet zone: 4 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.3 inches
Content of organic matter in the upper 10 inches: 4.7 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 30 to 50 percent of the mapped areas

Minor Dissimilar Components

Tripoli and similar soils

Extent: 5 to 25 percent of the mapped areas

4408B—Olin-Urban land complex, 2 to 5 percent slopes

Component Description

Olin and similar soils

Extent: 30 to 50 percent of the mapped areas
Geomorphic setting: Uplands; hills

Position on the landform: Summits
Geomorphic component: Interfluves
Slope range: 2 to 5 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Sandy sediments and the underlying glacial till
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 9.5 inches
Content of organic matter in the upper 10 inches: 1.9 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 30 to 50 percent of the mapped areas

Minor Dissimilar Components

Kenyon and similar soils

Extent: 0 to 20 percent of the mapped areas

Sparta and similar soils

Extent: 5 to 15 percent of the mapped areas

4408C—Olin-Urban land complex, 5 to 9 percent slopes

Component Description

Olin and similar soils

Extent: 30 to 50 percent of the mapped areas
Geomorphic setting: Uplands; hillsides
Position on the landform: Shoulders, backslopes
Geomorphic component: Interfluves
Slope range: 5 to 9 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Sandy sediments and the underlying glacial till
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 9.5 inches
Content of organic matter in the upper 10 inches: 1.9 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 25 to 45 percent of the mapped areas

Minor Dissimilar Components

Sparta and similar soils

Extent: 5 to 25 percent of the mapped areas

Kenyon and similar soils

Extent: 0 to 20 percent of the mapped areas

4426B—Aredale-Urban land complex, 2 to 5 percent slopes

Component Description

Aredale and similar soils

Extent: 30 to 50 percent of the mapped areas
Geomorphic setting: Uplands; hills
Position on the landform: Summits
Geomorphic component: Interfluves
Slope range: 2 to 5 percent
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 10 inches
Content of organic matter in the upper 10 inches: 3.2 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 30 to 50 percent of the mapped areas

Minor Dissimilar Components

Kenyon and similar soils

Extent: 10 to 30 percent of the mapped areas

4426C—Aredale-Urban land complex, 5 to 9 percent slopes

Component Description

Aredale and similar soils

Extent: 35 to 55 percent of the mapped areas
Geomorphic setting: Hillsides; uplands
Position on the landform: Backslopes, shoulders
Geomorphic component: Interfluves
Slope range: 5 to 9 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Depth to wet zone: More than 6.7 feet all year
Ponding: None
Available water capacity to a depth of 60 inches: 10 inches
Content of organic matter in the upper 10 inches: 3.2 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 30 to 50 percent of the mapped areas

Minor Dissimilar Components

Kenyon and similar soils

Extent: 5 to 25 percent of the mapped areas

4585—Spillville, occasionally flooded-Coland, occasionally flooded-Urban land complex, 0 to 2 percent slopes

Component Description

Spillville, occasionally flooded, and similar soils

Extent: 25 to 45 percent of the mapped areas
Geomorphic setting: Flood plains
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Somewhat poorly drained
Parent material: Alluvium
Months in which flooding does not occur: January, December
Highest frequency of flooding: Occasional (February, March, April, May, June, July, August, September, October, November)
Shallowest depth to wet zone: 1 foot (April)
Deepest depth to wet zone: 4 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.8 inches
Content of organic matter in the upper 10 inches: 4.1 percent

Coland, occasionally flooded, and similar soils

Extent: 15 to 35 percent of the mapped areas
Geomorphic setting: Flood plains
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Poorly drained
Parent material: Alluvium
Months in which flooding does not occur: January, December
Highest frequency of flooding: Occasional (February, March, April, May, June, July, August, September, October, November)
Shallowest depth to wet zone: At the surface (April)
Deepest depth to wet zone: 3 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.4 inches
Content of organic matter in the upper 10 inches: 5.7 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 15 to 35 percent of the mapped areas

Minor Dissimilar Components

Marshan soils that are 24 to 40 inches to sand and gravel

Extent: 5 to 25 percent of the mapped areas

4761—Franklin-Urban land complex, 1 to 3 percent slopes

Component Description

Franklin and similar soils

Extent: 40 to 60 percent of the mapped areas
Geomorphic setting: Uplands; hills
Position on the landform: Summits
Geomorphic component: Interfluves
Slope range: 1 to 3 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Somewhat poorly drained
Parent material: Loess and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 1 foot (April)
Deepest depth to wet zone: 4 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.4 inches
Content of organic matter in the upper 10 inches: 2.4 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 40 to 60 percent of the mapped areas

4771B—Waubeek-Urban land complex, 2 to 5 percent slopes

Component Description

Waubeek and similar soils

Extent: 30 to 50 percent of the mapped areas
Geomorphic setting: Uplands; hills
Position on the landform: Summits
Geomorphic component: Interfluves
Slope range: 2 to 5 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Parent material: Loess and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 4 feet (April)
Deepest depth to wet zone: More than 6.7 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.5 inches
Content of organic matter in the upper 10 inches: 2.4 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 25 to 45 percent of the mapped areas

Minor Dissimilar Components

Franklin and similar soils

Extent: 10 to 20 percent of the mapped areas

Billett and similar soils

Extent: 0 to 20 percent of the mapped areas

4771D—Waubeek-Urban land complex, 5 to 14 percent slopes

Component Description

Waubeek and similar soils

Extent: 35 to 55 percent of the mapped areas
Geomorphic setting: Hillsides; uplands
Position on the landform: Summits
Geomorphic component: Side slopes
Slope range: 5 to 14 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Parent material: Loess and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 4 feet (April)
Deepest depth to wet zone: More than 6.7 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 11.5 inches
Content of organic matter in the upper 10 inches: 2.4 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets,

parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 30 to 50 percent of the mapped areas

Minor Dissimilar Components

Billett and similar soils

Extent: 5 to 25 percent of the mapped areas

4798—Protivin-Urban land complex, 1 to 3 percent slopes

Component Description

Protivin and similar soils

Extent: 35 to 55 percent of the mapped areas
Geomorphic setting: Hills; uplands
Position on the landform: Summits
Geomorphic component: Interfluves
Slope range: 1 to 3 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Somewhat poorly drained
Parent material: Loamy sediments and the underlying glacial till
Flooding: None
Shallowest depth to wet zone: 1 foot (April)
Deepest depth to wet zone: 4 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 10.2 inches
Content of organic matter in the upper 10 inches: 6.4 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 30 to 50 percent of the mapped areas

Minor Dissimilar Components

Readlyn and similar soils

Extent: 0 to 20 percent of the mapped areas

Donnan and similar soils

Extent: 0 to 10 percent of the mapped areas

4911B—Colo-Ely-Urban land complex, 2 to 5 percent slopes

Component Description

Colo and similar soils

Extent: 30 to 50 percent of the mapped areas
Geomorphic setting: Drainageways on uplands
Slope range: 2 to 3 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Poorly drained
Parent material: Alluvium
Months in which flooding does not occur: January, December
Highest frequency of flooding: Frequent (February, March, April, May, June, July, August, September, October, November)
Shallowest depth to wet zone: At the surface (April)
Deepest depth to wet zone: 3 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 12.6 inches
Content of organic matter in the upper 10 inches: 5.7 percent

Ely and similar soils

Extent: 20 to 40 percent of the mapped areas
Geomorphic setting: Uplands; hills
Position on the landform: Footslopes
Geomorphic component: Base slopes
Slope range: 3 to 5 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Somewhat poorly drained
Parent material: Local alluvium
Flooding: None
Shallowest depth to wet zone: 1 foot (April)
Deepest depth to wet zone: 4 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 12.3 inches
Content of organic matter in the upper 10 inches: 5 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other

structures. The original soils can no longer be identified.
Extent: 20 to 40 percent of the mapped areas

4933—Sawmill, occasionally flooded-Urban land complex, 0 to 2 percent slopes

Component Description

Sawmill, occasionally flooded, and similar soils

Extent: 35 to 55 percent of the mapped areas
Geomorphic setting: Flood plains
Slope range: 0 to 2 percent
Depth to restrictive feature: Very deep (more than 60 inches)
Drainage class: Poorly drained
Parent material: Alluvium
Months in which flooding does not occur: January, December
Highest frequency of flooding: Occasional (February, March, April, May, June, July, August, September, October, November)
Shallowest depth to wet zone: At the surface (April)
Deepest depth to wet zone: 3 feet (September)
Ponding: None
Available water capacity to a depth of 60 inches: 12.3 inches
Content of organic matter in the upper 10 inches: 6 percent

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 35 to 55 percent of the mapped areas

Minor Dissimilar Components

Nevin and similar soils

Extent: 0 to 20 percent of the mapped areas

4946—Orthents-Urban land complex

Component Description

Orthents, loamy, and similar soils

Extent: 40 to 60 percent of the mapped areas
Depth to restrictive feature: More than 60 inches
Flooding: None
Ponding: None

Urban land

General description: This component consists of areas that are covered by buildings, roads, streets, parking lots, mobile home parks, and other structures. The original soils can no longer be identified.
Extent: 40 to 60 percent of the mapped areas

5010—Pits, sand and gravel

Definition: This map unit consists of areas from which sand and gravel have been removed.
Extent: 100 percent of the map unit

5030—Pits, limestone quarries

Definition: This map unit consists of areas from which limestone has been removed.
Extent: 100 percent of the map unit

5040—Orthents, loamy

Component Description

Orthents, loamy, and similar soils

Extent: 100 percent of the map unit
Depth to restrictive feature: More than 60 inches
Flooding: None
Ponding: None

5053—Psammaquents, frequently flooded

Component Description

Psammaquents, frequently flooded, and similar soils

Extent: 100 percent of the map unit
Geomorphic setting: Flood plains
Slope range: 0 to 2 percent
Depth to restrictive feature: More than 60 inches
Drainage class: Very poorly drained
Months in which flooding does not occur: January, December
Highest frequency of flooding: Frequent (February, March, April, May, June, July, August, September, October, November)

Shallowest depth to wet zone: 0.5 foot (January, February, March, April, May, June, July, November, December)
Deepest depth to wet zone: More than 6 feet (August, September, October)
Ponding: None

5080—Orthents, sanitary landfill

Component Description

Orthents, sanitary landfill, and similar soils

Extent: 100 percent of the map unit
Depth to restrictive feature: More than 60 inches
Flooding: None
Ponding: None

AW—Animal waste

• This map unit consists of shallow ponds constructed to hold animal waste from farm feedlots.

SL—Sewage lagoon

• This map unit consists of shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid waste.

W—Water

• This map unit consists of natural bodies of water.

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as forestland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and as wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand, gravel, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Interpretive Ratings

The interpretive tables in this survey rate the soils in the survey area for various uses. 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.

Crops and Pasture

General management needed for crops and pasture is suggested in this section. The estimated yields of the main crops and pasture plants are listed, the system of land capability classification used by the Natural Resources Conservation Service is explained, and prime farmland is described.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under the heading “Detailed Soil Map Units.” Specific information can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Cropland Management Considerations

The management concerns affecting the use of the detailed soil map units for crops are shown in table 5. The main concerns in managing nonirrigated cropland are conserving moisture, controlling wind erosion and water erosion, and maintaining soil fertility.

Conserving moisture consists primarily of reducing the evaporation and runoff rates and increasing the water infiltration rate. Applying conservation tillage and conservation cropping systems, farming on the contour, stripcropping, establishing field windbreaks, and leaving crop residue on the surface conserve moisture.

Generally, a combination of several practices is needed to control *wind erosion* and *water erosion.* Conservation tillage, stripcropping, field windbreaks, contour farming, conservation cropping systems, crop residue management, terraces, diversions, and grassed waterways help to prevent excessive soil loss.

Measures that are effective in *maintaining soil 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 considerations shown in the table cannot be easily overcome. These are *channels, flooding, gullies,* and *ponding.*

Additional considerations include the following:

Lime content, limited available water capacity, potential poor tilth and compaction, and *restricted permeability.*—These limitations can be minimized by incorporating green manure crops, manure, or crop residue into the soil; applying a system of conservation tillage; and using conservation cropping systems. Also, crops may respond well to additions of phosphate fertilizer in areas of soils that have a high content of lime.

Potential for ground-water contamination.—The proper use of nutrients and pesticides can reduce the risk of ground-water contamination.

Potential for surface-water contamination.—The risk of surface-water contamination can be reduced by the proper use of nutrients and pesticides and by conservation farming practices that reduce the runoff rate.

Surface crusting.—This limitation retards seedling development after periods of heavy rainfall.

Surface rock fragments.—This limitation causes rapid wear of tillage equipment. It cannot be easily overcome.

Surface stones.—Stones or boulders on or near the surface can hinder normal tillage unless they are removed.

Salt content.—In areas where this is a limitation, only salt-tolerant crops should be grown.

On irrigated soils the main management concerns are efficient water use, nutrient management, control of erosion, pest and weed control, and timely planting and harvesting for a successful crop. An irrigation system that provides optimum control and distribution of water at minimum cost is needed. Overirrigation wastes water, leaches plant nutrients, and causes erosion. Also, it can increase wetness and soil salinity.

Explanation of Criteria

Acid soil.—The pH is less than 6.1.

Channeled.—The word “channeled” is included in the map unit name.

Dense layer.—The bulk density is 1.80 g/cc or greater within the soil profile.

Depth to rock.—The depth to bedrock is less than 40 inches.

Eroded.—The word “eroded” is included in the map unit name.

Excessive permeability.—Saturated hydraulic conductivity is 42 micrometers per second or more within the soil profile.

Flooding.—Flooding is occasional, frequent, or very frequent.

Gullied.—The word “gullied” is included in the map unit name.

High content of organic matter.—The surface layer has more than 20 percent organic matter.

Lime content.—The pH is 7.4 or more in the surface layer, or the wind erodibility group is 4L.

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.

Limited content of organic matter.—The content of organic matter is 2 percent or less in the surface layer.

Ponding.—Ponding duration is assigned to the map unit component. Water is above the surface.

Potential poor tilth and compaction.—The content of clay is 27 percent or more in the surface layer.

Potential for ground-water contamination (by nutrients or pesticides).—The depth to a seasonal high water table is 4 feet or less, the saturated hydraulic conductivity of any layer is more than 42 micrometers per second, or the depth to bedrock is less than 60 inches.

Potential for surface-water contamination (by nutrients or pesticides).—The map unit component is occasionally, frequently, or very frequently flooded, is subject to ponding, is assigned to hydrologic group C or D and has a slope of more than 2 percent, is assigned to hydrologic group A and has a slope of more than 6 percent, or is assigned to hydrologic group B, has a slope of 3 percent or more, and has a K factor of more than 0.17.

Restricted permeability.—Saturated hydraulic conductivity is less than 0.42 micrometer per second within the soil profile.

Salt content.—The electrical conductivity is 4 or more in the surface layer or 8 or more within a depth of 30 inches.

Seasonal high water table.—The water table is within 2.5 feet of the surface.

Slope (equipment limitation).—The slope is more than 15 percent.

Surface crusting.—The content of clay in the surface layer is 27 percent or more, and the content of organic matter is 2 percent or less.

Surface rock fragments (equipment limitation).—The terms describing the texture of the surface layer include any rock fragment modifier, except for gravelly, channery, stony, very stony, extremely stony, bouldery, very bouldery, and extremely bouldery.

Surface stones (equipment limitation).—The word "stony" or "bouldery" is included in the description of the surface layer, or at least 0.01 percent of the surface is covered with boulders.

Water erosion.—Either the slope is 6 percent or more, or the slope is more than 3 percent and less than 6 percent and the surface layer is not sandy.

Wind erosion.—The wind erodibility group is 1, 2, 3, or 4L.

Hydrologic groups are described under the heading "Water Features." Erosion factors (e.g., K factor) and wind erodibility groups are described under the heading "Physical Properties."

Crop Yield Estimates

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 6. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of each soil also is shown in the table.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations also are considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 6 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Table 6 also shows the corn suitability rating (CSR) for the soils in the survey area. Corn suitability ratings provide a relative ranking of all soils mapped in the State of Iowa based on their potential to be utilized for the intensive production of row crops. The CSR is an index that can be used to rate the potential production of one soil compared with another over a period of time. The CSR considers average weather conditions and frequency of use of the soil for row crops. Ratings range from 100 for soils that have no physical limitations, are on minimal slopes, and can be continuously row cropped to as low as 5 for soils that have severe limitations affecting the production of row crops. The ratings listed in this table assume adequate management, natural weather conditions (no irrigation), artificial drainage where required, and no land leveling or terracing. They also assume that soils in the lower positions on the landscape are not affected by frequent damaging floods. The weighted CSR for a given field can be modified by the occurrence of sandy spots, local deposits, rock and gravel outcrops, field boundaries, and noncrossable drainageways. Even though predicted average yields will change with time, the CSRs are expected to remain relatively constant in relation to one another.

The CSRs in Black Hawk County range from 95 (for map unit 7) to 5 (for map unit 159C, for example). No ratings are provided for miscellaneous areas because of the variability of properties and use of these areas.

Inherent subsoil fertility levels, in terms of potential plant-available phosphorus and potassium, also are given in table 6. Soil tests of the tilled layer are used to determine the most profitable rates of fertilizers for various crops. Nutrient levels in the subsurface layers influence crop yields, particularly in the drier seasons when the nutrients in the dry tilled layer become temporarily unavailable to plants. The availability of nutrients in the tilled layer and the subsoil influences the relative uptake from the two zones in the soil profile. Fertilizer recommendations based on soil tests of the tilled layer may be adjusted by the average nutrient levels in the subsoil of each soil series. The ratings given in the table are described as follows:

Subsoil phosphorus.—The amount of plant-available phosphorus in the subsoil expressed in parts per million and based on the weighted average of air-dried soil samples from the subsoil (at a depth of 30 to 42 inches). (The value listed for complexes is the most limiting value of the soils identified in the map unit name.) A rating of very low (VL) indicates less than 7.5 ppm; low (L), 7.5 to 13.0 ppm; medium (M), 13.0 to 22.5 ppm; and high (H), more than 22.5 ppm.

Subsoil potassium.—The amount of plant-available potassium in the subsoil expressed in parts per million and based on the weighted average of air-dried soil samples from the subsoil (at a depth of 12 to 24 inches). (The value listed for complexes is the most limiting value of the soils identified in the map unit name.) A rating of very low (VL) indicates less than 50 ppm; low (L), 50 to 79 ppm; medium (M), 79 to 125 ppm; and high (H), more than 125 ppm.

Pasture and Hayland Interpretations

Under good management, proper grazing is essential for the production of high-quality forage, stand survival, and erosion control. Proper grazing helps plants to maintain sufficient and generally vigorous top growth during the growing season. Brush control is essential in many areas, and weed control generally is needed. Rotation grazing and renovation also are important management practices.

The average yields per acre that can be expected of the principal pasture and hay crops under a high level of management are shown in table 7. Yield estimates are often provided in animal unit months (AUM), or the amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about forage yields other than those shown in the table.

Land Capability Classification

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

In the capability system, soils generally are grouped at three levels—capability class, subclass, and unit (USDA, 1961). These categories indicate the degree and kinds of limitations affecting mechanized farming systems that produce the more commonly grown field crops, such as corn, small grain, cotton, hay, and field-grown vegetables. Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use.

If properly managed, soils in classes 1, 2, 3, and 4 are suitable for the mechanized production of commonly grown field crops and for pasture and woodland. The degree of the soil limitations affecting the production of cultivated crops increases progressively from class 1 to class 4. The limitations can affect levels of production and the risk of permanent soil deterioration caused by erosion and other factors.

Soils in classes 5, 6, and 7 are generally not suited to the mechanized production of commonly grown field crops without special management, but they are suitable for plants that provide a permanent cover, such as grasses and trees. The severity of the soil limitations affecting crops increases progressively from class 5 to class 7.

Areas in class 8 are generally not suitable for crops, pasture, or woodland without a level of management that is impractical. These areas may have potential for other uses, such as recreational facilities and wildlife habitat.

Capability subclasses identify the dominant kind of limitation in the class. They are designated by adding a small letter, *e, w, s,* or *c*, to the class numeral, for example, 2e. The letter *e* shows that the main hazard is the risk of erosion unless a close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness has been partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

There are no subclasses in class 1 because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w, s,* or *c* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use mainly to pasture, woodland, wildlife habitat, or recreation.

The capability classification of the soils in the survey area is given in tables 6 and 7.

Prime Farmland

Prime farmland is of major importance in meeting the Nation's short- and long-range needs for food and fiber. The acreage of high-quality farmland is limited, and the U.S. Department of Agriculture recognizes that government at local, State, and Federal levels, as well as individuals, must encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland soils, as defined by the U.S. Department of Agriculture, are soils that are best suited to food, feed, forage, fiber, and oilseed crops. Such soils have properties that favor the economic production of sustained high yields of crops. The soils need only to be treated and managed by acceptable farming methods. An adequate moisture supply and a sufficiently long growing season are required. Prime farmland soils produce the highest yields with minimal expenditure of energy and economic resources, and farming these soils results in the least damage to the environment.

Prime farmland soils may presently be used as cropland, pasture, or woodland or for other purposes. They either are used for food and fiber or are available for these uses. Urban or built-up land, public land, and water areas cannot be considered prime farmland. Urban or built-up land is any contiguous unit of land 10 acres or more in size that is used for such purposes as housing, industrial, and commercial sites, sites for institutions or public buildings, small parks, golf courses, cemeteries, railroad yards, airports, sanitary landfills, sewage treatment plants, and water-control structures. Public land is land not available for farming in National forests, National parks, military reservations, and State parks.

Prime farmland soils commonly receive an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable, and the level of acidity or alkalinity and the content of salts and sodium are acceptable. The soils have few, if any, rocks and are permeable to water and air. They are not excessively erodible or saturated with water for long periods, and they are not frequently flooded during the growing season or are protected from flooding. Slopes range mainly from 0 to 6 percent.

Soils that have a high water table or are subject to flooding may qualify as prime farmland where these limitations are overcome by drainage measures or flood control. Onsite evaluation is necessary to determine the effectiveness of corrective measures. More information about the criteria for prime farmland can be obtained at the local office of the Natural Resources Conservation Service.

A recent trend in land use has been the conversion of prime farmland to urban and industrial uses. The loss of prime farmland to other uses puts pressure on lands that are less productive than prime farmland.

The map units in the survey area that meet the requirements for prime farmland are listed in table 8. This list does not constitute a recommendation for a particular land use. On some soils included in the table, measures that overcome limitations are needed. The need for these measures is indicated in parentheses after the map unit name. The location of each map unit is shown on the detailed soil maps. The soil qualities that affect use and management are described in the section "Detailed Soil Map Units."

Windbreaks and Environmental Plantings

Windbreaks protect livestock, buildings, yards, fruit trees, gardens, and cropland from wind and snow; help to keep snow on fields; and provide food and cover for wildlife. Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To ensure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Table 9 shows the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates in table 9 are based on measurements and observation of established plantings that have been given adequate care. They can be used as a guide in planning windbreaks and screens. Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from the local office of the Natural Resources Conservation Service or of the Cooperative Extension Service or from a commercial nursery.

Woodland Management and Productivity

Table 10 can help woodland owners or forest managers plan the use of soils for wood crops. Only the soils commonly used for wood crops are listed.

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

The *volume,* a number, is the yield likely to be produced by the most important trees. This number, expressed as cubic feet per acre per year, indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

Trees to manage are those that are suitable for commercial wood production.

Recreation

The soils of the survey area are rated in tables 11a and 11b 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 tables 11a and 11b 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 12, 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, soybeans, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture also are considerations. Examples of grasses and legumes are bromegrass, timothy, orchardgrass, 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, bluegrass, dandelion, goldenrod, ragweed, wheatgrass, and nightshade.

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, box elder, birch, maple, green ash, willow, and American elm. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are Russian-olive, 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, 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 Hungarian partridge, ring-necked pheasant, bobwhite quail, sharp-tailed grouse, meadowlark, field sparrow, killdeer, cottontail rabbit, 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, owls, tree 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, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. Tables 13a and 13b 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

Tables 14a and 14b 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 72 inches or between a depth of 24 inches and a restrictive layer is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Considered in the ratings are slope, permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, flooding, large stones, and content of organic matter.

Soil permeability is a critical property affecting the suitability for sewage lagoons. Most porous soils eventually become sealed when they are used as sites for sewage lagoons. Until sealing occurs, however, the hazard of pollution is severe. Soils that have a permeability rate of more than 2 inches per hour are too porous for the proper functioning of sewage lagoons. In these soils, seepage of the effluent can result in contamination of the ground water. Ground-water contamination is also a hazard if fractured bedrock is within a depth of 40 inches, if the water table is high enough to raise the level of sewage in the lagoon, or if floodwater overtops the lagoon.

A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor. If the lagoon is to be uniformly deep throughout, the slope must be gentle enough and the soil material must be thick enough over bedrock or a cemented pan to make land smoothing practical.

A *trench sanitary landfill* is an area where solid waste is placed in successive layers in an excavated trench. The waste is spread, compacted, and covered daily with a thin layer of soil excavated at the site. When the trench is full, a final cover of soil material at least 2 feet thick is placed over the landfill. The ratings in the table are based on the soil properties that affect the risk of pollution, the ease of excavation, trafficability, and revegetation. These properties include permeability, depth to bedrock or a cemented pan, depth to a water table, ponding, slope, flooding, texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, onsite investigation may be needed.

Hard, nonrippable bedrock, creviced bedrock, or highly permeable strata in or directly below the proposed trench bottom can affect the ease of excavation and the hazard of ground-water pollution. Slope affects construction of the trenches and the movement of surface water around the landfill. It also affects the construction and performance of roads in areas of the landfill.

Soil texture and consistence affect the ease with which the trench is dug and the ease with which the soil can be used as daily or final cover. They determine the workability of the soil when dry and when wet. Soils that are plastic and sticky when wet are difficult to excavate, grade, or compact and are difficult to place as a uniformly thick cover over a layer of refuse.

The soil material used as the final cover for a trench landfill should be suitable for plants. It should not have excess sodium or salts and should not be too acid. The surface layer generally has the best workability, the highest content of organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

In an *area sanitary landfill*, solid waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site. A final cover of soil material at least 2 feet thick is placed over the completed landfill. The ratings in the table are based on the soil properties that affect trafficability and the risk of pollution. These properties include flooding, permeability, depth to a water table, ponding, slope, and depth to bedrock or a cemented pan.

Flooding is a serious problem because it can result in pollution in areas downstream from the landfill. If permeability is too rapid or if fractured bedrock, a fractured cemented pan, or the water table is close to the surface, the leachate can contaminate the water supply. Slope is a consideration because of the extra grading required to maintain roads in the steeper areas of the landfill. Also, leachate may flow along the surface of the soils in the steeper areas and cause difficult seepage problems.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste. The ratings in the table also apply to the final cover for a landfill. They are based on the soil properties that affect workability, the ease of digging, and the ease of moving and spreading the material over the refuse daily during wet and dry periods. These properties include soil texture, depth to a water table, ponding, rock fragments, slope, depth to bedrock or a cemented pan, reaction, and content of salts, sodium, or lime.

Loamy or silty soils that are free of large stones and excess gravel are the best cover for a landfill. Clayey soils may be sticky and difficult to spread; sandy soils are subject to wind erosion.

Slope affects the ease of excavation and of moving the cover material. Also, it can influence runoff, erosion, and reclamation of the borrow area.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. It should not have excess sodium, salts, or lime and should not be too acid.

Construction Materials

Tables 15a and 15b give information about the soils as potential sources of gravel, sand, reclamation material, roadfill, and topsoil. 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 15a, 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 as *possible, probable,* or *improbable* sources of gravel and are rated *good, fair,* or *poor* as potential sources of sand. In this table, gravel is defined as particles ranging from 0.2 inch to 3.0 inches in diameter. Soils rated as a *possible* source of gravel contain at least 25 percent gravel, by weight. Soils rated as a *probable* source contain at least 50 percent gravel, by weight. The likelihood of the soil being a source of gravel is reduced by the content of rock fragments larger than 3 inches in diameter. For sand, a rating of *good* or *fair* means that the source material is likely to be in or below the soil. For both sand and gravel, 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 table. 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.

Water Management

Table 16 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The 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 table 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 5 or 6 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

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.

Tables 17a and 17b show 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).

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.

Overland flow of wastewater is a process in which wastewater is applied to the upper reaches of sloped land and allowed to flow across vegetated surfaces, sometimes called terraces, to runoff-collection ditches. The length of the run generally is 150 to 300 feet. The application rate ranges from 2.5 to 16.0 inches per week. It commonly exceeds the rate needed for irrigation of cropland. The wastewater leaves solids and nutrients on the vegetated surfaces as it flows downslope in a thin film. Most of the water reaches the collection ditch, some is lost through evapotranspiration, and a small amount may percolate to the ground water.

The ratings in the table are based on the soil properties that affect absorption, plant growth, microbial activity, and the design and construction of the system. Reaction and the cation-exchange capacity affect absorption. Reaction, salinity, and the sodium adsorption ratio affect plant growth and microbial activity. Slope, permeability, depth to a water table, ponding, flooding, depth to bedrock or a cemented pan, stones, and cobbles affect design and construction. Permanently frozen soils are unsuitable for waste treatment.

Rapid infiltration of wastewater is a process in which wastewater applied in a level basin at a rate of 4 to 120 inches per week percolates through the soil. The wastewater may eventually reach the ground water. The application rate commonly exceeds the rate needed for irrigation of cropland. Vegetation is not a necessary part of the treatment; hence, the basins may or may not be vegetated. The thickness of the soil material needed for proper treatment of the wastewater is more than 72 inches. As a result, geologic and hydrologic investigation is needed to ensure proper design and performance and to determine the risk of ground-water pollution.

The ratings in the table are based on the soil properties that affect the risk of pollution and the design, construction, and performance of the system. Depth to a water table, ponding, flooding, and depth to bedrock or a cemented pan affect the risk of pollution and the design and construction of the system. Slope, stones, and cobbles also affect design and construction. Permeability and reaction affect performance. Permanently frozen soils are unsuitable for waste treatment.

Slow rate treatment of wastewater is a process in which wastewater is applied to land at a rate normally between 0.5 inch and 4.0 inches per week. The application rate commonly exceeds the rate needed for irrigation of cropland. The applied wastewater is treated as it moves through the soil. Much of the treated water may percolate to the ground water, and some enters the atmosphere through evapotranspiration. The applied water generally is not allowed to run off the surface. Waterlogging is prevented either through control of the application rate or through the use of tile drains, or both.

The ratings in the table are based on the soil properties that affect absorption, plant growth, microbial activity, erodibility, and the application of waste. The properties that affect absorption include the sodium adsorption ratio, depth to a water table, ponding, available water capacity, permeability, depth to bedrock or a cemented pan, reaction, the cation-exchange capacity, and slope. Reaction, the sodium adsorption ratio, salinity, and bulk density affect plant growth and microbial activity. The wind erodibility group, the soil erodibility factor K, and slope are considered in estimating the likelihood of wind erosion or water erosion. Stones, cobbles, a water table, ponding, and flooding can hinder the application of waste. Permanently frozen soils are unsuitable for waste treatment.

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.

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.

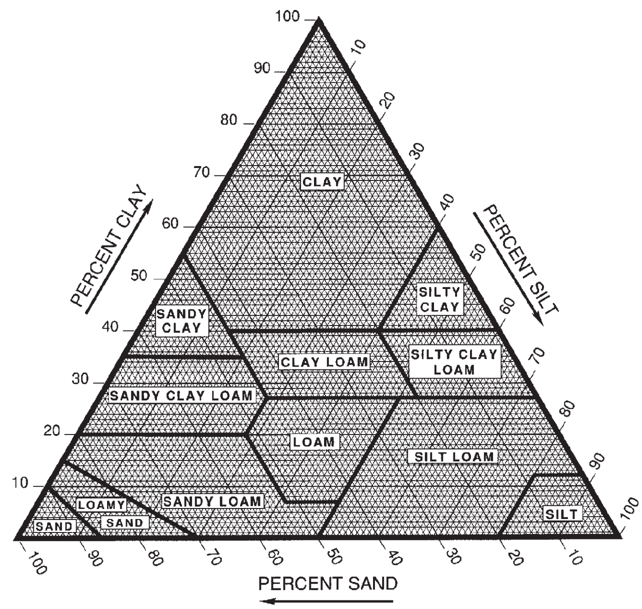

Figure 8.—Percentages of clay, silt, and sand in the basic USDA soil textural classes.

Engineering Index Properties

Table 18 gives the engineering classifications and the range of index properties for the layers of each soil in the survey area.

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter (fig. 8). "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (ASTM, 2005) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2004).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

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

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

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

Physical Properties

Table 19 shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In table 19, 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 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 term “permeability,” as used in soil surveys, indicates saturated hydraulic conductivity (K_{sat}). The estimates in the table indicate the rate of water movement, in inches per hour, when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at $^1/_3$- or $^1/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. Volume change is influenced by the amount and type of clay minerals in the soil.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 19, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained by returning crop residue to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion factors are shown in table 19 as the K factor (Kw and Kf) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and permeability. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. Descriptions of these groups are available in the National Soil Survey Handbook (USDA/NRCS).

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

Chemical Properties

Table 20 shows estimates of some chemical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Cation-exchange capacity is the total amount of extractable bases that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. The ability to retain cations reduces the hazard of ground-water pollution.

Effective cation-exchange capacity refers to the sum of extractable bases plus aluminum expressed in terms of milliequivalents per 100 grams of soil. It is determined for soils that have pH of less than 5.5.

Soil reaction is a measure of acidity or alkalinity. The pH of each soil horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Calcium carbonate equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil. Incorporating nitrogen fertilizer into calcareous soils helps to prevent nitrite accumulation and ammonium-N volatilization.

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of soil if used as construction material, and the potential of the soil to corrode metal and concrete.

Water Features

Table 21 gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

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 21 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 21 indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and *frequency* 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 22 gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, 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 23 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 Mollisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aquolls (*Aqu*, meaning water, plus *oll*, from Mollisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; 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 Endoaquolls (*Endo*, meaning within, plus *aquoll*, the suborder of the Mollisols that has an aquic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic 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 Endoaquolls.

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, superactive, mesic Typic Endoaquolls.

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. 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.

Aredale Series

Typical Pedon

Aredale loam, 2 to 5 percent slopes, in a cultivated field; 1,500 feet south and 80 feet east of the northwest corner of sec. 2, T. 89 N., R. 11 W.; USGS Littleton SW topographic quarter quadrangle; lat. 42 degrees 33 minutes 03.9 seconds N. and long. 92 degrees 07 minutes 15.75 seconds W., NAD 83:

Ap—0 to 8 inches; black (10YR 2/1) loam, very dark gray (10YR 3/1) dry; weak fine granular structure; friable; common fine roots; common fine tubular pores; neutral; clear smooth boundary.

A1—8 to 14 inches; black (10YR 2/1) loam, very dark gray (10YR 3/1) dry; weak fine granular structure; friable; common fine roots; common fine tubular pores; neutral; clear smooth boundary.

A2—14 to 18 inches; about 60 percent very dark brown (10YR 2/2) and 40 percent very dark grayish brown (10YR 3/2) loam, dark grayish brown (10YR 4/2) dry; weak fine subangular blocky structure parting to weak fine and medium granular; friable; common very fine roots; common fine tubular pores; neutral; clear smooth boundary.

AB—18 to 24 inches; about 50 percent dark brown (10YR 3/3) and 50 percent brown (10YR 4/3) loam; weak fine subangular blocky structure parting to weak fine and medium granular; friable; common very fine roots; common fine tubular pores; neutral; clear smooth boundary.

Bw1—24 to 29 inches; dark yellowish brown (10YR 4/4) and brown (10YR 4/3) loam; weak fine subangular blocky structure parting to weak fine and medium granular; friable; few very fine roots; common fine tubular pores; slightly acid; gradual smooth boundary.

Bw2—29 to 35 inches; yellowish brown (10YR 5/4) loam; weak fine subangular blocky structure; friable; few very fine roots; common fine tubular pores; slightly acid; gradual smooth boundary.

Bw3—35 to 44 inches; yellowish brown (10YR 5/4) loam; weak fine and medium subangular blocky structure; friable; few fine tubular pores; few fine very dark grayish brown (10YR 3/2) masses of iron-manganese; discontinuous stone line consisting of rounded gravel and cobbles 1 to 6 inches in diameter (5 to 10 percent of this horizon); few fine prominent strong brown (7.5YR 5/8) redoximorphic concentrations; slightly acid; gradual smooth boundary.

2Bw4—44 to 60 inches; yellowish brown (10YR 5/6) loam; weak fine and medium subangular blocky structure; firm; few very fine tubular pores; common fine very dark brown (10YR 2/2) masses of iron-manganese; about 2 percent subrounded mixed gravel; common fine distinct strong brown (7.5YR 5/8) redoximorphic concentrations; common fine prominent grayish brown (10YR 5/2) redoximorphic depletions; slightly acid; gradual wavy boundary.

2BC—60 to 68 inches; yellowish brown (10YR 5/6) loam; moderate fine prismatic and moderate fine and medium subangular blocky structure; firm; common fine very dark brown (10YR 2/2) masses of iron-manganese; about 2 percent subrounded mixed gravel; common fine prominent grayish brown (10YR 5/2) redoximorphic depletions; moderately acid; abrupt smooth boundary.

2Cg—68 to 80 inches; grayish brown (10YR 5/2) loam; massive; firm; common fine prominent strong brown (7.5YR 5/8) redoximorphic concentrations; moderately acid.

Range in Characteristics

Thickness of the mollic epipedon: 12 to 24 inches
Depth to till: 42 to 60 inches
Depth to carbonates: More than 48 inches

Ap and A horizons:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture—loam

Bw horizon:
Hue—10YR
Value—4 or 5
Chroma—3 or 4
Texture—loam or sandy loam; a stone line is commonly at the lower boundary of this horizon

2Bw horizon:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—2 to 6
Texture—loam or sandy loam

2BC and 2C horizons:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—2 to 6
Texture—loam

Taxadjunct features: The Aredale soil in map unit 462C2 is a taxadjunct because the surface layer does not meet the requirements for a mollic epipedon.

Atkinson Series

Typical Pedon

Atkinson loam, 2 to 5 percent slopes, in a cultivated field; Winneshiek County, Iowa; 465 feet east and 45 feet south of the northwest corner of sec. 18, T. 96 N., R. 10 W.; USGS Protivin SW topographic quarter quadrangle; lat. 43 degrees 08 minutes 27.08 seconds N. and long. 92 degrees 04 minutes 46.16 seconds W., NAD 83:

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) loam, dark grayish brown (10YR 4/2) dry; weak and moderate fine granular structure; friable; neutral; abrupt smooth boundary.

A—7 to 13 inches; very dark grayish brown (10YR 3/2) loam, dark grayish brown (10YR 4/2) dry; weak and moderate fine granular structure; friable; slightly acid; clear smooth boundary.

BA—13 to 19 inches; dark brown (10YR 3/3) loam, brown (10YR 4/3) dry; weak fine and medium subangular blocky structure; friable; many fine and medium pores; few very dark brown (10YR 2/2) coatings on faces of peds; moderately acid; clear smooth boundary.

Bt1—19 to 24 inches; brown (10YR 4/3) loam; weak fine and medium subangular blocky structure; friable; common faint discontinuous dark yellowish brown (10YR 3/4) clay films on faces of peds and in pores; stone line with a few stones up to 6 inches in diameter; moderately acid; abrupt smooth boundary.

Bt2—24 to 35 inches; yellowish brown (10YR 5/4) clay loam; moderate medium subangular blocky structure; firm; common fine pores; many faint discontinuous dark yellowish brown (10YR 4/4) clay films on faces of peds and in pores; about 5 percent pebbles; moderately acid; clear smooth boundary.

Bt3—35 to 45 inches; yellowish brown (10YR 5/4 and 5/6) clay loam; moderate medium subangular blocky structure; firm; many fine pores; many faint discontinuous dark yellowish brown (10YR 4/4) clay films on faces of peds and in pores; about 5 percent pebbles; moderately acid; abrupt wavy boundary.

2Bt4—45 to 50 inches; strong brown (7.5YR 5/6) clay; moderate fine and medium subangular blocky structure; very firm; moderately acid; abrupt wavy boundary.

2R—50 inches; hard, fractured limestone bedrock.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Depth to bedrock: 40 to 55 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—loam or silt loam

BA horizon:
Hue—10YR
Value—3 or 4
Chroma—2 or 3
Texture—loam or silt loam

Bt horizon:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—3 to 6
Texture—clay loam, sandy clay loam, or loam

2Bt horizon:
Hue—7.5YR, 5YR, or 10YR
Value—3 to 6
Chroma—3 to 8
Texture—clay or silty clay

Bassett Series

Typical Pedon

Bassett loam, 2 to 5 percent slopes, in a cultivated field; 2,600 feet north and 630 feet west of the southeast corner of sec. 8, T. 90 N., R. 14 W.; USGS New Hartford NE topographic quarter quadrangle; lat. 42 degrees 37 minutes 16.2 seconds N. and long. 92 degrees 31 minutes 01.3 seconds W., NAD 83:

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

E—8 to 14 inches; dark grayish brown (10YR 4/2) and brown (10YR 4/3) loam; weak fine and medium subangular blocky structure; friable; common fine roots; common fine tubular pores; common distinct discontinuous dark brown (10YR 3/3) organic coatings on faces of peds; slightly acid; clear smooth boundary.

BE—14 to 19 inches; brown (10YR 4/3) loam; weak fine and medium subangular blocky structure; friable; common very fine roots; common fine tubular pores; few faint discontinuous very dark grayish brown (10YR 3/3) organic coatings on faces of peds; moderately acid; clear smooth boundary.

Bt1—19 to 24 inches; dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/4) loam; moderate fine and medium subangular blocky structure; friable; few very fine roots; common fine tubular pores; few faint discontinuous very dark grayish brown (10YR 4/3) clay films on faces of peds; about 2 percent subrounded mixed gravel; discontinuous stone line consisting of rounded gravel and cobbles 1 to 6 inches in diameter (5 to 10 percent of this horizon); common fine prominent yellowish brown (10YR 5/8) redoximorphic concentrations; moderately acid; gradual smooth boundary.

2Bt2—24 to 32 inches; yellowish brown (10YR 5/6 and 5/8) loam; moderate fine and medium subangular blocky structure; firm; few prominent discontinuous very dark grayish brown (10YR 3/2) clay films; common fine black (10YR 2/1) masses of iron-manganese; about 5 percent subrounded mixed gravel; common fine prominent grayish brown (10YR 5/2) redoximorphic depletions; moderately acid; gradual smooth boundary.

2Bt3—32 to 48 inches; yellowish brown (10YR 5/6) and grayish brown (10YR 5/2) loam; moderate medium prismatic structure; firm; few prominent discontinuous very dark grayish brown (10YR 3/2) clay films; few prominent continuous light brownish gray (10YR 6/2) silt coatings on faces of peds; common fine very dark brown (10YR 2/2) masses of iron-manganese; about 5 percent subrounded mixed gravel; common fine prominent strong brown (7.5YR 5/8) redoximorphic concentrations; slightly acid; gradual smooth boundary.

2Bt4—48 to 60 inches; yellowish brown (10YR 5/6) and grayish brown (10YR 5/2) clay loam; moderate medium and coarse prismatic structure; firm; few prominent discontinuous very dark grayish brown (10YR 3/2) clay films; few prominent continuous light brownish gray (10YR 6/2) silt coatings on faces of peds; common fine very dark brown (10YR 2/2) masses of iron-manganese; about 8 percent subrounded mixed gravel; common fine prominent strong brown (7.5YR 5/8) redoximorphic concentrations; slightly acid; gradual smooth boundary.

2BC—60 to 72 inches; yellowish brown (10YR 5/6) and grayish brown (10YR 5/2) clay loam; weak medium and coarse prismatic structure; firm; common fine very dark brown (10YR 2/2) masses of iron-manganese; about 8 percent subrounded mixed gravel; common fine prominent strong brown (7.5YR 5/8) redoximorphic concentrations; slightly acid; gradual smooth boundary.

2C—72 to 80 inches; yellowish brown (10YR 5/6) and grayish brown (10YR 5/2) clay loam; massive; firm; common fine very dark brown (10YR 2/2) masses of iron-manganese; about 8 percent subrounded mixed gravel; common fine prominent strong brown (7.5YR 5/8) redoximorphic concentrations; slightly acid.

Range in Characteristics

Thickness of the mollic epipedon: 6 to 10 inches
Depth to till: 12 to 26 inches

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

E and BE horizons:
Hue—10YR
Value—4
Chroma—2 or 3
Texture—loam

Bt horizon:
Hue—10YR
Value—4 or 5
Chroma—2 to 8
Texture—loam; a stone line is commonly at the lower boundary of this horizon

2Bt horizon:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—2 to 8
Texture—loam, clay loam, or sandy clay loam

2BC or 2C horizon:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—2 to 8
Texture—loam, clay loam, or sandy clay loam

Bertram Series

Typical Pedon

Bertram fine sandy loam, 2 to 5 percent slopes, in a grass field; 550 feet south and 50 feet east of the northwest corner of sec. 1, T. 88 N., R. 11 W.; USGS Jesup NW topographic quarter quadrangle; lat. 42 degrees 27 minutes 59.1 seconds N. and long. 92 degrees 05 minutes 02.2 seconds W., NAD 83:

A1—0 to 9 inches; very dark brown (10YR 2/2) fine sandy loam, dark grayish brown (10YR 4/2) dry; weak fine granular structure; very friable; many very fine and fine roots; neutral; clear smooth boundary.

A2—9 to 18 inches; very dark grayish brown (10YR 3/2) fine sandy loam, grayish brown (10YR 5/2) dry; weak medium subangular blocky structure; very friable; common very fine roots; slightly acid; gradual smooth boundary.

Bw1—18 to 27 inches; brown (10YR 4/3) fine sandy loam; weak medium subangular blocky structure; very friable; common very fine roots; slightly acid; gradual smooth boundary.

2Bw2—27 to 31 inches; dark yellowish brown (10YR 4/4) sandy clay loam; weak fine subangular blocky structure; friable; few very fine roots; slightly alkaline; abrupt smooth boundary.

2C—31 to 34 inches; brown (10YR 4/3) sandy clay loam; massive; friable; few very fine roots; slightly alkaline; abrupt smooth boundary.

2R—34 inches; limestone bedrock.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Depth to bedrock: 20 to 40 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—2 or 3
Texture—fine sandy loam or sandy loam

Bw horizon:
Hue—10YR
Value—3 to 5
Chroma—3 or 4
Texture—fine sandy loam or sandy loam

2Bw horizon:
Hue—10YR
Value—4 or 5
Chroma—3 or 4
Texture—sandy clay loam or clay loam

2C horizon:
Hue—10YR
Value—4 or 5
Chroma—3 or 4
Texture—sandy clay loam or sandy loam

Billett Series

Typical Pedon

Billett sandy loam, 2 to 5 percent slopes, in a cultivated field; 2,240 feet north and 2,500 feet west of the southeast corner of sec. 28, T. 87 N., R. 11 W.; USGS LaPorte City NE topographic quarter quadrangle; lat. 42 degrees 19 minutes 04.4 seconds N. and long. 92 degrees 07 minutes 56.4 seconds W., NAD 83:

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) sandy loam, grayish brown (10YR 5/2) dry; weak medium subangular blocky structure; very friable; common very fine and fine roots; common very fine and fine tubular pores; neutral; clear smooth boundary.

BE—7 to 15 inches; brown (10YR 4/3) fine sandy loam; moderate thin platy structure; very friable; common very fine roots; common very fine and fine interstitial and tubular pores; common faint discontinuous dark brown (10YR 3/3) organic coatings on faces of peds; neutral; clear smooth boundary.

Bt1—15 to 24 inches; dark yellowish brown (10YR 4/4) fine sandy loam; moderate fine and medium subangular blocky structure; very friable; few very fine roots; common very fine and fine interstitial and tubular pores; few faint discontinuous brown (10YR 4/3) clay films on faces of peds; moderately acid; gradual smooth boundary.

Bt2—24 to 38 inches; strong brown (7.5YR 5/6) fine sandy loam; moderate fine and medium subangular blocky structure; very friable; few very fine roots; many very fine and fine interstitial pores; few distinct discontinuous brown (7.5YR 4/4) clay films on faces of peds; moderately acid; gradual smooth boundary.

BC—38 to 51 inches; strong brown (7.5YR 5/6) and grayish brown (10YR 5/3) fine sandy loam; weak coarse subangular blocky structure; very friable; many very fine and fine interstitial pores; few prominent discontinuous dark yellowish brown (10YR 4/4) clay films on faces of peds; moderately acid; gradual smooth boundary.

C—51 to 80 inches; light yellowish brown (10YR 6/4) loamy fine sand; single grain; loose; few medium and coarse prominent strong brown (7.5YR 5/6) redoximorphic concentrations; moderately acid.

Range in Characteristics

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

BE horizon:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—2 to 4
Texture—sandy loam or fine sandy loam

Bt horizon:
Hue—10YR or 7.5YR
Value—4 to 6
Chroma—3 to 6
Texture—sandy loam, fine sandy loam, sandy clay loam, or loam

BC and C horizons:
Hue—10YR or 7.5YR
Value—4 to 7

Chroma—3 to 6
Texture—loamy sand, fine sandy loam, sand, loamy fine sand or fine sand or the gravelly analogs of these textures

Value—4 to 6
Chroma—4 to 6
Texture—sand or coarse sand or the gravelly and very gravelly analogs of these textures

Burkhardt Series

Typical Pedon

Burkhardt sandy loam, in an area of Burkhardt-Bassett-Chelsea complex, 18 to 60 percent slopes; in a wooded area; 2,100 feet west and 25 feet south of the northeast corner of sec. 32, T. 90 N., R. 14 W.; USGS New Hartford NE topographic quarter quadrangle; lat. 42 degrees 34 minutes 12.64 seconds N. and long. 92 degrees 31 minutes 20.80 seconds W., NAD 83:

A—0 to 7 inches; dark brown (10YR 3/3) sandy loam, brown (10YR 5/3) dry; weak fine and medium subangular blocky structure; very friable; common very fine and fine roots; many very fine and fine interstitial and tubular pores; slightly acid; clear smooth boundary.

Bt—7 to 20 inches; brown (10YR 4/3) sandy loam; weak fine and medium subangular blocky structure; very friable; common very fine roots; many very fine and fine interstitial and tubular pores; few faint discontinuous dark grayish brown (10YR 4/2) clay films; slightly acid; clear smooth boundary.

2C1—20 to 32 inches; brown (7.5YR 5/4) sand; single grain; loose; common very fine roots; moderately acid; gradual smooth boundary.

2C2—32 to 80 inches; strong brown (7.5YR 5/6) sand; single grain; loose; moderately acid.

Range in Characteristics

Thickness of the mollic epipedon: 7 to 20 inches
Depth to sandy material: 10 to 20 inches

A horizon:
Hue—10YR or 7.5YR
Value—2 or 3
Chroma—1 to 3
Texture—sandy loam, loam, or gravelly sandy loam

Bt horizon:
Hue—10YR or 7.5YR
Value—3 or 4
Chroma—2 to 4
Texture—sandy loam or gravelly sandy loam

2C horizon:
Hue—10YR or 7.5YR

Chelsea Series

Typical Pedon

Chelsea loamy fine sand, 2 to 5 percent slopes, in a cultivated field; 340 feet south and 2,400 feet east of the northwest corner of sec. 23, T. 90 N., R. 11 W.; USGS Littleton SW topographic quarter quadrangle; lat. 42 degrees 35 minutes 51.91 seconds N. and long. 92 degrees 06 minutes 44.87 seconds W., NAD 83:

Ap—0 to 6 inches; dark brown (10YR 3/3) loamy fine sand, brown (10YR 5/3) dry; weak coarse subangular blocky structure; very friable; common fine roots; neutral; clear smooth boundary.

E1—6 to 11 inches; dark grayish brown (10YR 4/2) and dark yellowish brown (10YR 4/4) fine sand; single grain; loose; few very fine roots; slightly acid; gradual smooth boundary.

E2—11 to 26 inches; yellowish brown (10YR 4/4) fine sand; single grain; loose; few very fine roots; strongly acid; clear smooth boundary.

E&Bt1—26 to 53 inches; light yellowish brown (10YR 6/4) and brownish yellow (10YR 6/6) fine sand (E); single grain; loose; brown (7.5YR 4/4 and 5/4) lamellae of fine sandy loam $^1/_2$ inch to 2 inches thick (Bt); strongly acid; gradual smooth boundary.

E&Bt2—53 to 80 inches; pale brown (10YR 6/3) fine sand (E); single grain; loose; brown (7.5YR 4/4 and 5/4) lamellae of fine sandy loam $^1/_2$ inch to 2 inches thick (Bt); strongly acid.

Range in Characteristics

Ap or A horizon:
Hue—10YR
Value—3 or 4
Chroma—2 to 4
Texture—loamy fine sand or fine sand

E horizon:
Hue—10YR or 7.5YR
Value—4
Chroma—2 to 6
Texture—fine sand or loamy fine sand

E part of the E&Bt horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 to 6
Texture—loamy fine sand or fine sand

Bt part of the E&Bt horizon:
Hue—7.5YR or 10YR
Value—3 to 5
Chroma—3 to 6
Texture—sandy loam, loamy sand, fine sandy loam, or loamy fine sand

Clyde Series

Typical Pedon

Clyde silty clay loam, 0 to 3 percent slopes, in a cultivated field; 1,250 feet north and 250 feet east of the southwest corner of sec. 9, T. 90 N., R. 14 W.; USGS New Hartford NE topographic quarter quadrangle; lat. 42 degrees 37 minutes 02.46 seconds N. and long. 92 degrees 30 minutes 48.78 seconds W., NAD 83:

Ap—0 to 8 inches; black (10YR 2/1) silty clay loam, very dark gray (10YR 3/1) dry; weak fine granular structure; friable; common fine and medium roots; common very fine tubular pores; common fine prominent yellowish red (5YR 5/6) masses of iron; slightly acid; abrupt smooth boundary.

A—8 to 18 inches; very dark gray (5Y 3/1) clay loam, gray (5Y 4/1) dry; moderate fine subangular blocky structure; friable; common fine roots; common very fine tubular pores; common fine prominent olive brown (2.5Y 4/4) redoximorphic concentrations; slightly acid; clear smooth boundary.

Bg1—18 to 28 inches; gray (2.5Y 4/1) clay loam; moderate fine and medium subangular blocky structure; friable; common very fine roots; common very fine tubular pores; common fine prominent yellowish brown (10YR 5/6) redoximorphic concentrations; slightly acid; gradual wavy boundary.

Bg2—28 to 36 inches; gray (2.5Y 5/1) clay loam; moderate fine and medium subangular blocky structure; friable; few very fine roots; common very fine tubular pores; discontinuous stone line consisting of rounded gravel and cobbles 1 to 6 inches in diameter (5 to 10 percent of this horizon); common fine prominent yellowish brown (10YR 5/6) redoximorphic concentrations; slightly acid; gradual wavy boundary.

2BCg—36 to 41 inches; about 60 percent gray (2.5Y 5/1) and 40 percent yellowish brown (10YR 5/6) loam; weak fine and medium subangular blocky structure; firm; about 2 percent subrounded mixed gravel; slightly acid; gradual wavy boundary.

2Cg—41 to 80 inches; about 70 percent grayish brown (2.5Y 5/2) and 30 percent yellowish brown (10YR 5/6) loam; massive; firm; about 2 percent subrounded mixed gravel; neutral.

Range in Characteristics

Thickness of the mollic epipedon: 18 to 24 inches
Depth to carbonates: 45 to more than 80 inches
Depth to till: 30 to 50 inches

Ap and A horizons:
Hue—10YR to 5Y or N
Value—2 or 3
Chroma—0 to 2
Texture—silty clay loam, clay loam, loam, or silt loam

Bg horizon:
Hue—2.5Y or 5Y
Value—4 to 6
Chroma—1 to 8
Texture—loam or clay loam; a stone line is commonly at the lower boundary of this horizon

2BCg and 2Cg horizons:
Hue—7.5YR to 5Y
Value—5 or 6
Chroma—1 to 8
Texture—loam or clay loam

Coland Series

Typical Pedon

Coland clay loam, 0 to 2 percent slopes, occasionally flooded, in a cultivated field; 300 feet south and 1,450 feet east of the northwest corner of sec. 15, T. 90 N., R. 12 W.; USGS Waterloo North NE topographic quarter quadrangle; lat. 42 degrees 36 minutes 47.8 seconds N. and long. 92 degrees 15 minutes 11.9 seconds W., NAD 83:

Ap—0 to 9 inches; black (10YR 2/1) clay loam, very dark gray (10YR 3/1) dry; weak fine and medium subangular blocky structure; friable; common very fine and fine roots; common very fine tubular pores; neutral; abrupt smooth boundary.

A1—9 to 20 inches; black (10YR 2/1) clay loam, very dark gray (10YR 3/1) dry; weak fine subangular blocky structure; friable; common very fine roots; common very fine tubular pores; few fine prominent brown (7.5YR 4/4) redoximorphic concentrations; moderately acid; gradual smooth boundary.

A2—20 to 31 inches; black (10YR 2/1) clay loam, dark gray (10YR 3/1) dry; weak fine subangular blocky structure; friable; few very fine roots; common very fine tubular pores; few fine prominent brown (7.5YR 4/4) redoximorphic concentrations; moderately acid; clear smooth boundary.

A3—31 to 42 inches; very dark gray (10YR 3/1) clay loam, dark gray (10YR 4/1) dry; weak fine and medium subangular blocky structure; friable; few very fine roots; few very fine tubular pores; common fine prominent strong brown (7.5YR 4/6) redoximorphic concentrations; moderately acid; clear smooth boundary.

Cg1—42 to 55 inches; gray (2.5Y 5/1) clay loam; massive; friable; few very fine tubular pores; common fine and medium prominent strong brown (7.5YR 5/6) redoximorphic concentrations; slightly acid; clear smooth boundary.

2Cg2—55 to 80 inches; grayish brown (2.5Y 5/2) loamy sand; single grain; loose; few fine and medium black (10YR 2/1) masses of iron-manganese; many medium prominent yellowish brown (10YR 5/6) redoximorphic concentrations; neutral.

Range in Characteristics

Thickness of the mollic epipedon: More than 36 inches
Depth to carbonates: 48 to more than 60 inches

Ap and A horizons:
Hue—10YR
Value—2 or 3
Chroma—1
Texture—clay loam or silty clay loam

Cg horizon:
Hue—2.5Y, 5Y, or N
Value—2 to 5
Chroma—0 to 2
Texture—clay loam, loam, sandy loam, or loamy sand

Colo Series

Typical Pedon

Colo silty clay loam, 0 to 2 percent slopes, occasionally flooded, in a cultivated field; 1,360 feet south and 1,280 feet east of the northwest corner of sec. 6, T. 87 N., R. 14 W.; USGS Zaneta SE topographic quarter quadrangle; lat. 42 degrees 22 minutes 51.6 seconds N. and long. 92 degrees 31 minutes 27.2 seconds W., NAD 83:

Ap—0 to 8 inches; black (10YR 2/1) silty clay loam, very dark gray (10YR 3/1) dry; weak medium subangular blocky structure; friable; common very fine and fine roots; common very fine tubular pores; neutral; abrupt smooth boundary.

A1—8 to 17 inches; black (10YR 2/1) silty clay loam, very dark gray (10YR 3/1) dry; moderate fine subangular blocky structure; friable; common very fine roots; common very fine tubular pores; neutral; clear smooth boundary.

A2—17 to 26 inches; very dark gray (10YR 3/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine subangular blocky structure; friable; few very fine roots; common very fine tubular pores; neutral; clear smooth boundary.

A3—26 to 40 inches; very dark gray (10YR 3/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine and medium subangular blocky structure; friable; few very fine roots; common very fine tubular pores; few fine prominent strong brown (7.5YR 4/6) redoximorphic concentrations; neutral; gradual smooth boundary.

Bg—40 to 57 inches; dark gray (2.5Y 4/1) silty clay loam; weak medium subangular blocky structure; friable; common very fine tubular pores; common fine prominent strong brown (7.5YR 4/6) redoximorphic concentrations; neutral; gradual smooth boundary.

Cg—57 to 80 inches; dark gray (2.5Y 4/1) silty clay loam; massive; firm; many fine prominent strong brown (7.5YR 4/6) redoximorphic concentrations; neutral.

Range in Characteristics

Thickness of the mollic epipedon: More than 36 inches

Ap and A horizons:
Hue—10YR or N
Value—2 or 3
Chroma—0 or 1
Texture—silty clay loam or silt loam

Bg horizon:
Hue—10YR or 2.5Y
Value—3 or 4
Chroma—1
Texture—silty clay loam

Cg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—3 to 6
Chroma—1 or 2
Texture—silty clay loam

Dells Series

Typical Pedon

Dells silt loam, 0 to 2 percent slopes, in a cultivated field; 2,200 feet west and 2,400 feet south of the northeast corner of sec. 12, T. 87 N., R. 13 W.; USGS

Eagle Center NE topographic quarter quadrangle; lat. 42 degrees 21 minutes 47.82 seconds N. and long. 92 degrees 18 minutes 24.51 seconds W., NAD 83:

Ap—0 to 8 inches; very dark brown (10YR 2/2) silt loam, dark grayish brown (10YR 4/2) dry; weak medium subangular blocky structure; friable; common very fine roots; common very fine tubular pores; neutral; abrupt smooth boundary.

E—8 to 12 inches; dark grayish brown (10YR 4/2) silt loam; weak medium subangular blocky structure parting to weak fine granular; friable; common very fine roots; common very fine tubular pores; common faint discontinuous very dark grayish brown (10YR 3/2) organic coatings on faces of peds; moderately acid; clear smooth boundary.

BE—12 to 19 inches; brown (10YR 4/3) silt loam; moderate fine and medium subangular blocky structure; friable; few very fine roots; common very fine tubular pores; common faint discontinuous very dark grayish brown (10YR 3/2) organic coatings on faces of peds; moderately acid; clear smooth boundary.

Bt1—19 to 29 inches; brown (10YR 5/3) silty clay loam; moderate fine and medium subangular blocky structure; friable; few very fine roots; common very fine tubular pores; few faint thin very dark grayish brown (10YR 4/3) clay films on faces of peds; few fine distinct yellowish brown (10YR 5/6) redoximorphic concentrations; few fine faint grayish brown (10YR 5/2) redoximorphic depletions; moderately acid; abrupt smooth boundary.

Bt2—29 to 33 inches; brown (10YR 5/3) silt loam; weak fine and medium subangular blocky structure; friable; few faint thin very dark grayish brown (10YR 4/3) clay films on faces of peds; common fine faint dark yellowish brown (10YR 4/4) redoximorphic concentrations; few fine faint light brownish gray (10YR 6/2) redoximorphic depletions; moderately acid; gradual smooth boundary.

2Bt3—33 to 36 inches; yellowish brown (10YR 5/3) loam; weak fine and medium subangular blocky structure; friable; few faint thin brown (10YR 5/3) clay films on faces of peds; common fine faint dark yellowish brown (10YR 4/4) redoximorphic concentrations; few fine faint light brownish gray (10YR 6/2) redoximorphic depletions; moderately acid; clear smooth boundary.

2C1—36 to 44 inches; light brownish gray (10YR 6/2) and yellowish brown (10YR 5/4) loamy sand; single grain; loose; common medium prominent brown (7.5YR 4/4) redoximorphic concentrations; moderately acid; gradual smooth boundary.

2C2—44 to 80 inches; yellowish brown (10YR 5/4) loamy sand; single grain; loose; few fine prominent strong brown (7.5YR 5/6) redoximorphic concentrations; about 12 percent gravel; moderately acid.

Range in Characteristics

Depth to sandy material: 20 to 36 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silt loam

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

BE horizon:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—3 to 5
Texture—silt loam

Bt horizon:
Hue—10YR or 7.5YR
Value—4 to 6
Chroma—3 to 5
Texture—silt loam or silty clay loam

2Bt horizon:
Hue—10YR or 7.5YR
Value—4 to 6
Chroma—3 to 5
Texture—sandy loam, loam, or sandy clay loam

2C horizon:
Hue—10YR or 7.5YR
Value—4 to 8
Chroma—2 to 4
Texture—loamy sand, sand, sandy loam, or loam

Dickinson Series

Typical Pedon

Dickinson fine sandy loam, 2 to 5 percent slopes, in a cultivated field; 240 feet south and 2,200 feet west of the northeast corner of sec. 7, T. 90 N., R. 13 W.; USGS Waverly SE topographic quarter quadrangle; lat. 42 degrees 37 minutes 40.3 seconds N. and long. 92 degrees 25 minutes 28 seconds W., NAD 83:

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) fine sandy loam, dark grayish brown (10YR 4/2) dry; weak medium subangular blocky structure; very friable; common very fine and fine roots; slightly acid; clear smooth boundary.

A—8 to 16 inches; very dark grayish brown (10YR 3/2) fine sandy loam, dark grayish brown (10YR 4/2) dry; weak fine and medium subangular blocky structure; very friable; common very fine roots; slightly acid; clear smooth boundary.

Bw—16 to 28 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak medium subangular blocky structure; very friable; few very fine roots; moderately acid; gradual smooth boundary.

C1—28 to 49 inches; yellowish brown (10YR 5/4) loamy fine sand; single grain; loose; slightly acid; gradual smooth boundary.

C2—49 to 80 inches; brown (10YR 5/6) loamy sand; single grain; loose; slightly acid.

Range in Characteristics

Thickness of the mollic epipedon: 12 to 24 inches
Depth to sandy material: 20 to 42 inches

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

Bw horizon:
Hue—10YR
Value—3 to 5
Chroma—2 to 4
Texture—sandy loam or fine sandy loam

C horizon:
Hue—10YR
Value—4 or 5
Chroma—3 to 6
Texture—loamy fine sand, loamy sand, fine sand, or sand

Dinsdale Series

Typical Pedon

Dinsdale silty clay loam, 2 to 5 percent slopes, in a cultivated field; 1,500 feet west and 1,680 feet north of the southeast corner of sec. 25, T. 87 N., R. 13 W.; USGS Eagle Center NE topographic quarter quadrangle; lat. 42 degrees 18 minutes 59.76 seconds N. and long. 92 degrees 18 minutes 15.17 seconds W., NAD 83:

Ap—0 to 7 inches; black (10YR 2/1) silty clay loam, very dark gray (10YR 3/1) dry; weak fine and medium subangular blocky structure; friable; common very fine and fine roots; common very fine tubular pores; moderately acid; abrupt smooth boundary.

A—7 to 12 inches; very dark brown (10YR 2/2) silty clay loam, dark grayish brown (10YR 4/2) dry; moderate fine subangular blocky structure parting to moderate fine granular; friable; common very fine roots; common very fine tubular pores; strongly acid; clear smooth boundary.

AB—12 to 19 inches; dark brown (10YR 3/3) silty clay loam, brown (10YR 4/3) dry; moderate fine subangular blocky structure; friable; few very fine roots; common very fine tubular pores; strongly acid; gradual smooth boundary.

Bt1—19 to 28 inches; brown (10YR 4/3) silty clay loam; moderate fine subangular blocky structure; friable; few very fine roots; common very fine tubular pores; few distinct dark brown (10YR 3/3) clay films on vertical faces of peds; strongly acid; clear smooth boundary.

Bt2—28 to 34 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak fine and medium subangular blocky structure; friable; common very fine tubular pores; few distinct brown (10YR 4/3) clay films on vertical faces of peds; discontinuous stone line consisting of rounded gravel and cobbles 1 to 6 inches in diameter (5 to 10 percent of this horizon); strongly acid; clear smooth boundary.

2Bt3—34 to 46 inches; about 50 percent brown (10YR 5/3) and 50 percent yellowish brown (10YR 5/6) loam; weak coarse subangular blocky structure; firm; few distinct brown (10YR 4/3) clay films on vertical faces of peds; about 3 percent subrounded gravel; common fine distinct gray (10YR 6/1) redoximorphic depletions; moderately acid; gradual smooth boundary.

2BC—46 to 58 inches; about 60 percent yellowish brown (10YR 5/4) and 40 percent yellowish brown (10YR 5/6) loam; weak coarse prismatic structure; firm; about 3 percent subrounded gravel; common fine distinct gray (10YR 6/1) redoximorphic depletions; neutral; gradual smooth boundary.

2C—58 to 80 inches; yellowish brown (10YR 5/6) loam; massive; firm; about 3 percent subrounded gravel; common fine and medium prominent gray (10YR 6/1) redoximorphic depletions; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Depth to till: 20 to 40 inches

Ap, A, and AB horizons:
Hue—10YR
Value—2 or 3

Chroma—1 to 3
Texture—silty clay loam or silt loam

Bt horizon:
Hue—10YR
Value—3 or 4
Chroma—3 or 4
Texture—silty clay loam; a stone line is commonly at the lower boundary of this horizon

2Bt and 2BC horizons:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—3 to 6
Texture—loam or clay loam

2C horizon:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—4 to 8
Texture—loam or clay loam

Taxadjunct features: The Dinsdale soil in map unit 377C2 is a taxadjunct because the surface layer does not meet the requirements for a mollic epipedon.

Dinsmore Series

Typical Pedon

Dinsmore silty clay loam, 2 to 5 percent slopes, in a cultivated field; 800 feet east and 300 feet north of the southwest corner of sec. 30, T. 87 N., R. 14 W.; USGS Reinbeck NE topographic quarter quadrangle; lat. 42 degrees 18 minutes 59.76 seconds N. and long. 92 degrees 18 minutes 15.17 seconds W., NAD 83:

Ap—0 to 8 inches; very dark brown (10YR 2/2) silty clay loam, very dark grayish brown (10YR 3/2) dry; weak fine granular structure; friable; common fine roots; common very fine tubular pores; slightly acid; clear smooth boundary.

A1—8 to 12 inches; very dark brown (10YR 2/2) silty clay loam, very dark grayish brown (10YR 3/2) dry; weak very fine subangular blocky structure; friable; common fine roots; common very fine tubular pores; moderately acid; clear smooth boundary.

A2—12 to 16 inches; very dark grayish brown (10YR 3/2) silty clay loam, dark grayish brown (10YR 4/2) dry; moderate fine subangular blocky structure; friable; common very fine roots; common very fine tubular pores; moderately acid; gradual smooth boundary.

Bt1—16 to 22 inches; brown (10YR 4/3) silty clay loam; moderate fine and medium subangular blocky structure; friable; few very fine roots; common very fine tubular pores; few distinct dark grayish brown (10YR 4/2) clay films on vertical faces of peds; moderately acid; gradual smooth boundary.

Bt2—22 to 30 inches; brown (10YR 4/3) silty clay loam; moderate medium subangular blocky structure; friable; few very fine roots; common very fine tubular pores; few distinct dark grayish brown (10YR 4/2) clay films on vertical faces of peds; strongly acid; gradual smooth boundary.

Bt3—30 to 36 inches; brown (10YR 5/3) silty clay loam; weak medium subangular blocky structure; friable; few very fine roots; common very fine tubular pores; few distinct grayish brown (10YR 5/2) clay films on vertical faces of peds; moderately acid; gradual smooth boundary.

Bt4—36 to 48 inches; yellowish brown (10YR 5/4) silty clay loam; weak medium subangular blocky structure; friable; common very fine tubular pores; few distinct grayish brown (10YR 5/2) clay films on vertical faces of peds; discontinuous stone line consisting of rounded gravel and cobbles 1 to 6 inches in diameter (5 to 10 percent of this horizon); slightly acid; gradual smooth boundary.

2C—48 to 80 inches; yellowish brown (10YR 5/4) loam; massive; friable; few very fine tubular pores; common fine and medium distinct grayish brown (10YR 5/2) redoximorphic depletions; common medium distinct (7.5YR 5/6) redoximorphic concentrations; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Depth to till: 40 to 60 inches
Depth to carbonates: 40 to more than 80 inches

Ap and A horizons:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture—silty clay loam or silt loam

Bt horizon:
Hue—10YR
Value—4 or 5
Chroma—3 to 6
Texture—silty clay loam; a stone line is commonly at the lower boundary of this horizon

2BC or 2C horizon:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—3 to 8
Texture—loam, clay loam, sandy loam, or sandy clay loam

Donnan Series

Typical Pedon

Donnan loam, 2 to 5 percent slopes, in a cultivated field; 1,290 feet south and 600 feet east of the northwest corner of sec. 35, T. 89 N., R. 11 W.; USGS Jesup NW topographic quarter quadrangle; lat. 42 degrees 28 minutes 45.7 seconds N. and long. 92 degrees 07 minutes 08.1 seconds W., NAD 83:

Ap—0 to 8 inches; very dark brown (10YR 2/2) loam, very dark grayish brown (10YR 3/2) dry; weak medium subangular blocky structure; friable; common very fine and fine roots; common very fine tubular pores; neutral; abrupt smooth boundary.

E—8 to 13 inches; dark grayish brown (10YR 4/2) loam; weak fine and medium subangular blocky structure; friable; common very fine roots; common very fine tubular pores; slightly acid; clear smooth boundary.

Bt—13 to 23 inches; brown (10YR 4/3) loam; weak fine and medium subangular blocky structure; friable; few very fine roots; few very fine tubular pores; few faint discontinuous dark grayish brown (10YR 4/2) clay films on faces of peds; few fine distinct dark grayish brown (2.5Y 4/2) redoximorphic depletions; strongly acid; clear smooth boundary.

2Btg1—23 to 36 inches; gray (2.5Y 5/1) clay; moderate fine and medium subangular blocky structure; very firm; common faint discontinuous dark gray (2.5Y 4/1) clay films on faces of peds; few fine prominent strong brown (7.5YR 5/6) redoximorphic concentrations; strongly acid; gradual smooth boundary.

2Btg2—36 to 56 inches; gray (2.5Y 5/1) clay; moderate fine and medium subangular blocky structure; very firm; common faint discontinuous dark gray (2.5Y 4/1) clay films on faces of peds; common fine and medium prominent strong brown (7.5YR 5/6) redoximorphic concentrations; strongly acid; clear smooth boundary.

2Btg3—56 to 67 inches; gray (2.5Y 5/2) clay; weak medium subangular blocky structure; firm; few faint discontinuous dark gray (2.5Y 4/1) clay films on faces of peds; common fine and medium prominent strong brown (7.5YR 5/6) redoximorphic concentrations; moderately acid; gradual smooth boundary.

2Cg—67 to 80 inches; grayish brown (2.5Y 5/2) loam; massive; friable; common fine and medium prominent strong brown (7.5YR 5/6) redoximorphic concentrations; moderately acid.

Range in Characteristics

Depth to the clayey paleosol: 20 to 36 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—loam or silt loam

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

Bt horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—3 or 4
Texture—clay loam, loam, or silty clay loam

2Btg horizon:
Hue—2.5Y or 5Y
Value—3 to 6
Chroma—1 or 2
Texture—silty clay or clay

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

Dunkerton Series

Typical Pedon

Dunkerton sandy loam, 2 to 5 percent slopes, in a cultivated field; 640 feet south and 2,540 feet east of the northwest corner of sec. 36, T. 90 N., R. 11 W.; USGS Littleton NW topographic quarter quadrangle; lat. 42 degrees 34 minutes 04.9 seconds N. and long. 92 degrees 05 minutes 31.5 seconds W., NAD 83:

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) sandy loam, dark grayish brown (10YR 4/2) dry; weak fine granular structure; friable; common fine roots; common fine tubular pores; neutral; abrupt smooth boundary.

BE—9 to 15 inches; about 50 percent dark grayish brown (10YR 4/2) and 50 percent brown (10YR 4/3) sandy loam; weak thick platy and weak fine subangular blocky structure; friable; common fine roots; common fine tubular pores; slightly acid; clear smooth boundary.

Bt1—15 to 25 inches; brown (7.5YR 4/4) sandy loam;

weak fine subangular blocky structure; friable; common very fine roots; common fine tubular pores; few distinct dark grayish brown (10YR 4/2) clay films on vertical faces of peds; discontinuous stone line consisting of rounded gravel and cobbles 1 to 6 inches in diameter (5 to 10 percent of this horizon); common fine distinct grayish brown (10YR 5/2) redoximorphic depletions; slightly acid; abrupt smooth boundary.

2Bt2—25 to 36 inches; about 60 percent strong brown (7.5YR 5/6) and 40 percent light brownish gray (10YR 6/2) sandy clay loam; weak fine and medium subangular blocky structure; firm; few very fine roots; few distinct dark grayish brown (10YR 4/2) clay films on vertical faces of peds; common fine very dark brown (10YR 2/2) masses of iron-manganese; about 2 percent subrounded mixed gravel; moderately acid; gradual smooth boundary.

2Bt3—36 to 49 inches; about 50 percent strong brown (7.5YR 5/6) and 50 percent light brownish gray (10YR 6/2) loam; weak fine prismatic structure; firm; few distinct dark grayish brown (10YR 4/2) clay films on vertical faces of peds; common fine very dark brown (10YR 2/2) masses of iron-manganese; about 2 percent subrounded mixed gravel; common fine distinct yellowish brown (10YR 5/6) redoximorphic concentrations; strongly acid; gradual wavy boundary.

2C—49 to 80 inches; about 50 percent strong brown (7.5YR 5/6) and 50 percent pinkish gray (7.5YR 6/2) loam; massive; firm; common fine very dark brown (10YR 2/2) masses of iron-manganese; about 2 percent subrounded mixed gravel; common fine prominent reddish brown (5YR 4/4) redoximorphic concentrations; moderately acid.

Range in Characteristics

Depth to till: 24 to 36 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—2 or 3
Texture—sandy loam, fine sandy loam, loamy sand, or loamy fine sand

BE horizon:
Hue—10YR
Value—4 or 5
Chroma—2 to 4
Texture—sandy loam, fine sandy loam, loamy sand, or loamy fine sand

Bt horizon:
Hue—10YR or 7.5YR
Value—4 to 6
Chroma—2 to 6
Texture—sandy clay loam or sandy loam; a stone line is commonly at the lower boundary of this horizon

2Bt horizon:
Hue—2.5Y, 10YR, 7.5YR, or 5YR
Value—4 to 6
Chroma—1 to 8
Texture—loam, clay loam, or sandy clay loam

2BC or 2C horizon:
Hue—2.5Y, 10YR, 7.5YR, or 5YR
Value—4 to 6
Chroma—1 to 8
Texture—loam, clay loam, or sandy clay loam

Ely Series

Typical Pedon

Ely silty clay loam, in an area of Colo-Ely complex, 2 to 5 percent slopes, in a cultivated field; 890 feet north and 120 feet west of the southeast corner of sec. 14, T. 87 N., R. 13 W.; USGS Eagle Center NW topographic quarter quadrangle; lat. 42 degrees 20 minutes 36.5 seconds N. and long. 92 degrees 19 minutes 07.3 seconds W., NAD 83:

Ap—0 to 8 inches; black (10YR 2/1) silty clay loam, very dark gray (10YR 3/1) dry; weak fine and medium subangular blocky structure parting to weak fine granular; friable; common very fine and fine roots; common very fine tubular pores; neutral; abrupt smooth boundary.

A1—8 to 17 inches; black (10YR 2/1) silty clay loam, very dark gray (10YR 3/1) dry; weak fine subangular blocky structure parting to moderate fine and medium granular; friable; common very fine roots; common very fine tubular pores; neutral; clear smooth boundary.

A2—17 to 28 inches; very dark gray (10YR 3/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine subangular blocky structure parting to moderate fine and medium granular; friable; common very fine roots; common very fine tubular pores; neutral; clear smooth boundary.

Bg1—28 to 37 inches; dark grayish brown (10YR 4/2) silty clay loam; moderate fine and medium subangular blocky structure; friable; few very fine roots; common very fine tubular pores; few fine prominent strong brown (7.5YR 5/6) redoximorphic concentrations; neutral; clear smooth boundary.

Bg2—37 to 48 inches; grayish brown (10YR 5/2) silty clay loam; weak fine and medium subangular blocky structure; friable; few very fine roots; common very fine tubular pores; common fine and medium prominent strong brown (7.5YR 5/6) redoximorphic concentrations; neutral; clear smooth boundary.

BCg—48 to 63 inches; grayish brown (2.5Y 5/2) silty clay loam; weak medium subangular blocky structure; friable; common very fine tubular pores; common medium prominent strong brown (7.5YR 5/6) redoximorphic concentrations; neutral; clear smooth boundary.

Cg—63 to 80 inches; grayish brown (2.5Y 5/2), stratified silty clay loam and sandy loam; massive; friable; few very fine tubular pores; many medium prominent strong brown (7.5YR 5/6) redoximorphic concentrations; neutral.

Range in Characteristics

Thickness of the mollic epipedon: 20 to 30 inches

Ap and A horizons:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silty clay loam or silt loam

Bg horizon:
Hue—2.5Y or 10YR
Value—4 or 5
Chroma—2
Texture—silty clay loam or silt loam

BCg and Cg horizons:
Hue—2.5Y or 10YR
Value—4 or 5
Chroma—1 or 2
Texture—silty clay loam, silt loam, clay loam, loam, or sandy loam

Emeline Series

Typical Pedon

Emeline loam, 2 to 9 percent slopes, in a grass field; 260 feet north and 1,100 feet east of the southwest corner of sec. 23, T. 87 N., R. 12 W.; USGS LaPorte City NW topographic quarter quadrangle; lat. 42 degrees 19 minutes 38.5 seconds N. and long. 92 degrees 12 minutes 59.2 seconds W., NAD 83:

A—0 to 9 inches; very dark brown (10YR 2/2) loam, dark grayish brown (10YR 4/2) dry; moderate fine granular structure; friable; many very fine and fine roots; many very fine tubular pores; abrupt wavy boundary.

2R—9 inches; limestone bedrock.

Range in Characteristics

Thickness of the mollic epipedon: 4 to 10 inches
Depth to bedrock: 4 to 10 inches

A horizon:
Hue—10YR or 7.5YR
Value—2 or 3
Chroma—1 to 3
Texture—loam, clay loam, or silt loam

Finchford Series

Typical Pedon

Finchford loamy sand, 0 to 2 percent slopes, in a cultivated field; 1,700 feet south and 1,450 feet west of the northeast corner of sec. 13, T. 87 N., R. 12 W.; USGS LaPorte City NE topographic quarter quadrangle; lat. 42 degrees 21 minutes 3.4 seconds N. and long. 92 degrees 11 minutes 10.9 seconds W., NAD 83:

Ap—0 to 8 inches; very dark brown (10YR 2/2) loamy sand, dark grayish brown (10YR 4/2) dry; weak fine granular structure parting to single grain; very friable; common very fine and fine roots; about 4 percent fine gravel; neutral; clear smooth boundary.

A1—8 to 18 inches; very dark grayish brown (10YR 3/2) loamy sand, dark grayish brown (10YR 4/2) dry; weak fine subangular blocky structure parting to single grain; very friable; common very fine roots; about 8 percent fine gravel; slightly acid; clear smooth boundary.

A2—18 to 30 inches; dark brown (7.5YR 3/2) sand, brown (7.5YR 5/2) dry; single grain; loose; about 12 percent fine gravel; strongly acid; gradual smooth boundary.

C1—30 to 55 inches; brown (7.5YR 4/4) gravelly coarse sand; single grain; loose; about 20 percent fine gravel; moderately acid; gradual smooth boundary.

C2—55 to 70 inches; pale brown (10YR 6/3) coarse sand; single grain; loose; about 10 percent fine gravel; moderately acid; gradual smooth boundary.

C3—70 to 80 inches; pale brown (10YR 6/3) gravelly coarse sand; single grain; loose; about 16 percent fine gravel; moderately acid.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 34 inches

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

Bw horizon (if it occurs):
Hue—10YR or 7.5YR
Value—3 to 5
Chroma—2 or 3
Texture—sand, coarse sand, loamy coarse sand, or loamy sand or the gravelly analogs of these textures

C horizon:
Hue—7.5YR or 10YR
Value—3 to 6
Chroma—3 to 6
Texture—coarse sand, sand, gravelly coarse sand, or gravelly sand

Flagler Series

Typical Pedon

Flagler sandy loam, 0 to 2 percent slopes, in a cultivated field; 40 feet north and 1,040 feet west of the southeast corner of sec. 28, T. 90 N., R. 14 W.; USGS New Hartford NE topographic quarter quadrangle; lat. 42 degrees 34 minutes 40 seconds N. and long. 92 degrees 30 minutes 01 second W., NAD 83:

Ap—0 to 8 inches; very dark brown (10YR 2/2) sandy loam, dark grayish brown (10YR 4/2) dry; weak fine granular structure; friable; common fine roots; common fine interstitial and tubular pores; slightly acid; abrupt smooth boundary.

A—8 to 20 inches; very dark grayish brown (10YR 3/2) and very dark brown (10YR 2/2) sandy loam, dark grayish brown (10YR 4/2) dry; weak fine granular structure; friable; common fine roots; common fine interstitial and tubular pores; moderately acid; clear smooth boundary.

Bw—20 to 28 inches; brown (10YR 4/3) and dark brown (10YR 3/3) sandy loam; weak fine granular structure; friable; common fine roots; common fine interstitial and tubular pores; moderately acid; clear smooth boundary.

2BC—28 to 35 inches; dark yellowish brown (10YR 4/4 and 3/4) loamy sand; weak fine granular structure; very friable; common fine roots; common fine interstitial and tubular pores; moderately acid; clear smooth boundary.

2C1—35 to 42 inches; light yellowish brown (10YR 6/4) and brownish yellow (10YR 6/6) sand; single grain; loose; about 5 percent subrounded mixed gravel; moderately acid; gradual smooth boundary.

2C2—42 to 80 inches; light yellowish brown (10YR 6/4) and brownish yellow (10YR 6/6) gravelly coarse sand; single grain; loose; about 30 percent subrounded mixed gravel; slightly acid.

Range in Characteristics

Thickness of the mollic epipedon: 12 to 24 inches
Depth to sandy material: 20 to 36 inches

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

Bw horizon:
Hue—10YR or 7.5YR
Value—3 to 5
Chroma—3 to 6
Texture—sandy loam

2BC horizon:
Hue—10YR or 7.5YR
Value—3 to 5
Chroma—4 to 6
Texture—loamy sand or sand

2C horizon:
Hue—10YR
Value—4 to 6
Chroma—4 to 6
Texture—loamy sand, sand, or coarse sand or the gravelly analogs of these textures

Floyd Series

Typical Pedon

Floyd loam, in an area of Clyde-Floyd complex, 1 to 4 percent slopes, in a grass fence row; 1,850 feet west and 450 feet north of the southeast corner of sec. 14, T. 88 N., R. 13 W.; USGS Waterloo South SW topographic quarter quadrangle; lat. 42 degrees 25 minutes 47.2 seconds N. and long. 92 degrees 19 minutes 28.8 seconds W., NAD 83:

A1—0 to 11 inches; black (10YR 2/1) loam, very dark gray (10YR 3/1) dry; weak fine granular structure; friable; common fine roots; common very fine and fine tubular pores; neutral; clear smooth boundary.

A2—11 to 18 inches; very dark brown (10YR 2/2) and very dark grayish brown (10YR 3/2) loam, dark grayish brown (10YR 4/2) dry; weak fine subangular blocky and weak fine granular structure; friable; common fine roots; common very fine and fine tubular pores; neutral; clear smooth boundary.

Bw1—18 to 25 inches; brown (10YR 4/2) loam; weak fine subangular blocky structure; friable; common fine roots; common very fine and fine tubular pores; neutral; clear smooth boundary.

Bw2—25 to 34 inches; brown (10YR 4/2) loam; weak fine subangular blocky structure; friable; common fine roots; common very fine and fine tubular pores; discontinuous stone line consisting of rounded gravel and cobbles 1 to 6 inches in diameter (5 to 10 percent of this horizon); common fine prominent strong brown (7.5YR 5/6) redoximorphic concentrations; neutral; gradual smooth boundary.

2Bw3—34 to 46 inches; yellowish brown (10YR 5/4) and grayish brown (10YR 5/2) loam; weak fine and medium subangular blocky structure; firm; common fine roots; common very fine and fine tubular pores; common fine black (10YR 2/1) masses of iron-manganese accumulation; about 5 percent subrounded mixed gravel; neutral; gradual wavy boundary.

2Bw4—46 to 54 inches; yellowish brown (10YR 5/6) and grayish brown (10YR 5/2) loam; weak medium subangular blocky structure; firm; common fine roots; common fine black (10YR 2/1) masses of iron-manganese; about 5 percent subrounded mixed gravel; neutral; gradual wavy boundary.

2C—54 to 80 inches; yellowish brown (10YR 5/6) and grayish brown (10YR 5/2) loam; massive; firm; common fine black (10YR 2/1) masses of iron-manganese; about 2 percent subrounded mixed gravel; common fine prominent strong brown (7.5YR 5/8) redoximorphic concentrations; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 16 to 24 inches
Depth to till: 32 to 46 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—loam, clay loam, silty clay loam, or silt loam

Bw horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—2 or 3
Texture—loam, sandy clay loam, or sandy loam; a stone line is commonly at the lower boundary of this horizon

2Bw horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 or 5
Chroma—2 to 8
Texture—loam, clay loam, or sandy clay loam

2C horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 or 5
Chroma—2 to 8
Texture—loam, clay loam, or sandy clay loam

Franklin Series

Typical Pedon

Franklin silt loam, 1 to 3 percent slopes, in a cultivated field; 700 feet south and 480 feet west of the northeast corner of sec. 24, T. 90 N., R. 11 W.; USGS Littleton NW topographic quarter quadrangle; lat. 42 degrees 35 minutes 48.1 seconds N. and long. 92 degrees 05 minutes 0.7 second W., NAD 83:

Ap—0 to 8 inches; very dark gray (10YR 3/1) silt loam, dark gray (10YR 4/1) dry; weak fine granular structure; friable; common very fine and fine roots; common very fine tubular pores; slightly acid; abrupt smooth boundary.

E—8 to 14 inches; dark grayish brown (10YR 4/2) silt loam; weak thin platy structure; friable; common very fine roots; common very fine tubular pores; moderately acid; clear smooth boundary.

Btg—14 to 26 inches; grayish brown (10YR 5/2) and brown (10YR 5/3) silty clay loam; weak fine subangular blocky structure; friable; few very fine roots; common very fine tubular pores; common discontinuous dark grayish brown (10YR 4/2) clay films; strongly acid; clear smooth boundary.

2Bt—26 to 42 inches; 60 percent yellowish brown (10YR 5/6) and 40 percent gray (10YR 5/2) loam; weak fine and medium subangular blocky structure; firm; few very fine roots; few very fine tubular pores; common discontinuous dark grayish brown (10YR 4/2) clay films; strongly acid; fine very dark brown (7.5YR 2/2) masses of iron-manganese; strongly acid; gradual smooth boundary.

2BC—42 to 52 inches; 80 percent yellowish brown (10YR 5/6) and 20 percent gray (10YR 5/2) loam; weak coarse prismatic structure; firm; fine very dark brown (7.5YR 2/2) masses of iron-manganese; slightly acid; gradual smooth boundary.

2C1—52 to 62 inches; 60 percent yellowish brown (10YR 5/6) and 40 percent gray (10YR 5/2) loam; massive; very firm; fine very dark brown (7.5YR 2/2) masses of iron-manganese; slightly effervescent; slightly alkaline; clear smooth boundary.
2C2—62 to 80 inches; 80 percent yellowish brown (10YR 5/6) and 20 percent gray (10YR 5/2) loam; massive; very firm; fine very dark brown (7.5YR 2/2) masses of iron-manganese; strongly effervescent; moderately alkaline.

Range in Characteristics

Depth to till: 24 to 40 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silt loam

E horizon:
Hue—10YR
Value—4 or 5
Chroma—1 or 2
Texture—silt loam

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

2Bt horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—2 to 8
Texture—loam, clay loam, or sandy clay loam

2BC and 2C horizons:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—2 to 8
Texture—loam, clay loam, or sandy clay loam

Hayfield Series

Typical Pedon

Hayfield loam, 24 to 40 inches to sand and gravel, 0 to 2 percent slopes, in a cultivated field; 130 feet north and 400 feet west of the southeast corner of sec. 22, T. 90 N., R. 11 W.; USGS Littleton NW topographic quarter quadrangle; lat. 42 degrees 55 minutes 04.1 seconds N. and long. 92 degrees 07 minutes 25.9 seconds W., NAD 83:

Ap—0 to 9 inches; very dark brown (10YR 2/2) loam, dark grayish brown (10YR 4/2) dry; weak fine granular structure; friable; common fine roots; common fine interstitial and tubular pores; moderately acid; abrupt smooth boundary.
BE—9 to 13 inches; 50 percent brown (10YR 4/3) and 50 percent dark brown (10YR 3/3) loam; weak fine and medium subangular blocky structure; friable; common fine roots; common fine interstitial and tubular pores; moderately acid; clear smooth boundary.
Bt—13 to 25 inches; dark grayish brown (10YR 4/3) clay loam; moderate medium subangular blocky structure; friable; common fine roots; common fine interstitial and tubular pores; few faint patchy very dark grayish brown (10YR 3/2) clay films on faces of peds; few fine faint dark grayish brown (2.5Y 4/2) redoximorphic depletions and common fine prominent strong brown (7.5YR 5/6 and 5/8) redoximorphic concentrations; moderately acid; abrupt smooth boundary.
2BC—25 to 33 inches; brown (10YR 5/3) gravelly sandy loam; single grain; loose; about 30 percent subrounded mixed gravel; many fine distinct yellowish brown (10YR 5/6) redoximorphic concentrations; strongly acid; gradual smooth boundary.
2C1—33 to 38 inches; yellowish brown (10YR 5/6) gravelly loamy sand; single grain; loose; about 15 percent subrounded mixed gravel; strongly acid; gradual smooth boundary.
2C2—38 to 45 inches; 60 percent strong brown (7.5YR 5/6) and 40 percent grayish brown (10YR 5/2) gravelly sand; single grain; loose; about 15 percent subrounded mixed gravel; strongly acid; gradual wavy boundary.
2C3—45 to 56 inches; light brownish gray (10YR 6/2) coarse sand; single grain; loose; about 5 percent subrounded mixed gravel; common medium and coarse prominent strong brown (7.5YR 5/8) redoximorphic concentrations; moderately acid; gradual wavy boundary.
2C4—56 to 80 inches; 60 percent grayish brown (10YR 5/2) and 40 percent light brownish gray (10YR 6/2) gravelly coarse sand; about 25 percent subrounded mixed gravel; moderately acid.

Range in Characteristics

Depth to sand and gravel: 20 to 40 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—loam or silt loam

BE or E horizon:
Hue—10YR
Value—4 or 5
Chroma—1 or 2
Texture—loam or silt loam

Bt horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—3 or 4
Texture—clay loam, loam, sandy clay loam, silt loam, or silty clay loam

2BC horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture—sandy loam or gravelly sandy loam

2C horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture—stratified coarse sand, loamy coarse sand, sand, or loamy sand or the gravelly analogs of these textures

Kenyon Series

Typical Pedon

Kenyon loam, 2 to 5 percent slopes, in a cultivated field; 400 feet north and 1,215 feet west of the southeast corner of sec. 14, T. 88 N., R. 13 W.; USGS Waterloo South SW topographic quarter quadrangle; lat. 42 degrees 25 minutes 48.5 seconds N. and long. 92 degrees 19 minutes 17.3 seconds W., NAD 83:

Ap—0 to 8 inches; black (10YR 2/1) loam, very dark gray (10YR 3/1) dry; weak fine granular structure; friable; common fine and medium roots; neutral; clear smooth boundary.

A—8 to 14 inches; black (10YR 2/1) and very dark brown (10YR 2/2) loam, dark gray (10YR 4/1) dry; weak fine granular structure; friable; common fine roots; neutral; clear smooth boundary.

AB—14 to 20 inches; very dark brown (10YR 2/2) and very dark grayish brown (10YR 3/2) loam, dark grayish brown (10YR 4/2) dry; weak fine subangular blocky and weak fine granular structure; friable; common fine roots; discontinuous stone line consisting of rounded gravel and cobbles 1 to 6 inches in diameter (5 to 10 percent of this horizon); slightly acid; clear smooth boundary.

2Bw1—20 to 28 inches; dark yellowish brown (10YR 4/4) loam; weak fine subangular blocky structure; friable; common fine roots; slightly acid; gradual smooth boundary.

2Bw2—28 to 42 inches; yellowish brown (10YR 5/6) loam; weak fine subangular blocky structure; firm; common fine roots; about 2 percent subrounded mixed gravel; moderately acid; gradual smooth boundary.

2Bw3—42 to 51 inches; yellowish brown (10YR 5/6) loam; weak fine and medium subangular blocky structure; firm; common fine roots; about 2 percent subrounded mixed gravel; common fine prominent grayish brown (10YR 5/2) redoximorphic depletions; moderately acid; clear smooth boundary.

2Bw4—51 to 61 inches; yellowish brown (10YR 5/6) loam; weak medium subangular blocky structure; firm; common fine roots; about 2 percent subrounded mixed gravel; common fine prominent grayish brown (10YR 5/2) redoximorphic depletions; slightly effervescent; slightly alkaline; clear smooth boundary.

2C—61 to 80 inches; yellowish brown (10YR 5/6) loam; massive; firm; about 2 percent subrounded mixed gravel; many fine prominent grayish brown (10YR 5/2) redoximorphic depletions; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Depth to till: 13 to 24 inches
Depth to carbonates: 45 to 66 inches

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

Bw horizon (if it occurs):
Hue—10YR
Value—4 or 5
Chroma—3 or 4
Texture—loam or silt loam; a stone line is commonly at the lower boundary of this horizon

2Bw horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—2 to 6
Texture—loam, clay loam, or sandy clay loam

2C horizon:
Hue—10YR or 2.5Y

Value—4 to 6
Chroma—1 to 6
Texture—loam, clay loam, or sandy clay loam

Taxadjunct features: The Kenyon soils in map units 83C2 and 83D2 are taxadjuncts because the surface layer does not meet the requirements for a mollic epipedon.

Klinger Series

Typical Pedon

Klinger silty clay loam, 1 to 3 percent slopes, in a cultivated field; 1,440 feet north and 2,360 feet west of the southeast corner of sec. 5, T. 89 N., R. 14 W.; USGS New Hartford SE topographic quarter quadrangle; lat. 42 degrees 32 minutes 46.9 seconds N. and long. 92 degrees 31 minutes 24.6 seconds W., NAD 83:

Ap—0 to 8 inches; black (10YR 2/1) silty clay loam, very dark gray (10YR 3/1) dry; weak medium subangular blocky structure; friable; common very fine and fine roots; common very fine tubular pores; neutral; abrupt smooth boundary.

A—8 to 18 inches; very dark brown (10YR 2/2) silty clay loam, very dark grayish brown (10YR 3/2) dry; moderate fine and medium subangular blocky structure; friable; common very fine roots; common very fine tubular pores; slightly acid; clear smooth boundary.

Bg1—18 to 26 inches; dark grayish brown (10YR 4/2) silty clay loam; moderate fine and medium subangular blocky structure; friable; few very fine roots; common very fine tubular pores; common faint discontinuous very dark gray (10YR 3/1) organic coatings on faces of peds; slightly acid; clear smooth boundary.

Bg2—26 to 33 inches; dark grayish brown (2.5Y 4/2) silty clay loam; moderate fine and medium subangular blocky structure; friable; few very fine roots; common very fine tubular pores; discontinuous stone line consisting of rounded gravel and cobbles 1 to 6 inches in diameter (5 to 10 percent of this horizon); few fine prominent yellowish brown (10YR 5/6) redoximorphic concentrations; slightly acid; clear smooth boundary.

2Bg3—33 to 44 inches; about 70 percent yellowish brown (10YR 5/6) and 30 percent grayish brown (2.5Y 5/2) loam; weak fine and medium subangular blocky structure; firm; neutral; gradual smooth boundary.

2BC—44 to 52 inches; about 60 percent yellowish brown (10YR 5/6) and 40 percent grayish brown (2.5Y 5/2) loam; weak medium subangular blocky structure; firm; neutral; clear smooth boundary.

2C—52 to 80 inches; yellowish brown (10YR 5/6) loam; massive; firm; few fine black (10YR 2/1) masses of iron-manganese; common fine carbonate concretions; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 12 to 24 inches
Depth to till: 20 to 40 inches

Ap and A horizons:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silty clay loam or silt loam

Bg horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—2 to 4
Texture—silty clay loam; a stone line is commonly at the lower boundary of this horizon

2Bg and 2BC horizons:
Hue—10YR or 2.5Y
Value—5 or 6
Chroma—2 to 6
Texture—loam or clay loam

2C horizon:
Hue—10YR or 2.5Y
Value—5 or 6
Chroma—2 to 6
Texture—loam or clay loam

Klingmore Series

Typical Pedon

Klingmore silty clay loam, 1 to 3 percent slopes, in a cultivated field; 300 feet south and 200 feet east of the northwest corner of sec. 29, T. 87 N., R. 14 W.; USGS Reinbeck NE topographic quarter quadrangle; lat. 42 degrees 19 minutes 31.20 seconds N. and long. 92 degrees 30 minutes 49.34 seconds W., NAD 83:

Ap—0 to 8 inches; black (10YR 2/1) silty clay loam, very dark gray (10YR 3/1) dry; moderate fine granular structure; friable; common fine roots; common very fine tubular pores; slightly acid; clear smooth boundary.

A1—8 to 14 inches; very dark brown (10YR 2/2) silty clay loam, very dark grayish brown (10YR 3/2) dry; moderate fine subangular blocky structure;

friable; common very fine roots; common very fine tubular pores; moderately acid; clear smooth boundary.

A2—14 to 19 inches; very dark brown (10YR 2/2) silty clay loam, very dark grayish brown (10YR 3/2) dry; moderate fine subangular blocky structure; friable; common very fine roots; common very fine tubular pores; moderately acid; gradual smooth boundary.

Btg1—19 to 25 inches; dark grayish brown (10YR 4/2) silty clay loam; moderate medium subangular blocky structure; friable; few very fine roots; common very fine tubular pores; few distinct dark gray (10YR 4/1) clay films on vertical faces of peds; moderately acid; gradual smooth boundary.

Btg2—25 to 34 inches; dark grayish brown (2.5Y 4/2) silty clay loam; moderate fine subangular blocky structure; friable; few very fine roots; common very fine tubular pores; few distinct dark gray (10YR 4/1) clay films on vertical faces of peds; strongly acid; gradual smooth boundary.

Btg3—34 to 42 inches; dark grayish brown (2.5Y 4/2) silty clay loam; moderate medium subangular blocky structure; friable; few very fine roots; common very fine tubular pores; few distinct dark gray (10YR 4/1) clay films on vertical faces of peds; few fine prominent strong brown (7.5YR 5/6) redoximorphic concentrations; moderately acid; gradual smooth boundary.

Btg4—42 to 56 inches; dark grayish brown (10YR 4/2) silty clay loam; weak medium subangular blocky structure; friable; common very fine tubular pores; few distinct dark gray (10YR 4/1) clay films on vertical faces of peds; discontinuous stone line consisting of rounded gravel and cobbles 1 to 6 inches in diameter (5 to 10 percent of this horizon); few fine prominent strong brown (7.5YR 5/6) redoximorphic concentrations; slightly acid; gradual smooth boundary.

2Cg1—56 to 70 inches; about 60 percent grayish brown (2.5Y 5/2) and 40 percent strong brown (7.5YR 5/6) loam; massive; friable; few very fine tubular pores; about 3 percent subrounded gravel; slightly alkaline; gradual smooth boundary.

2Cg2—70 to 80 inches; about 60 percent grayish brown (10YR 5/2) and 40 percent yellowish brown (10YR 5/6) loam; massive; friable; about 3 percent subrounded gravel; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 14 to 20 inches
Depth to till: 40 to 60 inches
Depth to carbonates: 40 to more than 80 inches

Ap and A horizons:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture—silty clay loam or silt loam

Btg horizon:
Hue—2.5Y or 10YR
Value—4 to 6
Chroma—1 or 2
Texture—silty clay loam; a stone line is commonly at the lower boundary of this horizon

2Btg horizon or 2BCg horizon (if it occurs):
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—1 to 8
Texture—loam, clay loam, or sandy clay loam

2Cg horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—1 to 8
Texture—loam, clay loam, or sandy clay loam

Klossner Series

Typical Pedon

Klossner muck, 1 to 3 percent slopes, in an area of wetland vegetation; 1,900 feet north and 1,650 feet west of the southeast corner of sec. 15, T. 87 N., R. 13 W.; USGS Eagle Center NW topographic quarter quadrangle; lat. 42 degrees 20 minutes 46.4 seconds N. and long. 92 degrees 20 minutes 38.6 seconds W., NAD 83:

Oa1—0 to 6 inches; black (N 2/0) muck; weak fine subangular blocky structure; very friable; many very fine and fine roots; slightly acid; clear smooth boundary.

Oa2—6 to 24 inches; black (N 2/0) muck; weak fine subangular blocky structure; very friable; many very fine and fine roots; moderately acid; clear smooth boundary.

2A1—24 to 32 inches; black (N 2/0) mucky silt loam; weak fine subangular blocky structure; very friable; common very fine roots; neutral; gradual smooth boundary.

2A2—32 to 41 inches; black (N 2/0) mucky silt loam; weak fine subangular blocky structure; very friable; few very fine roots; slightly alkaline; clear smooth boundary.

2A3—41 to 49 inches; black (N 2/0) mucky silt loam; massive; very friable; few medium prominent greenish gray (5GY 6/1) redoximorphic depletions; slightly alkaline; clear smooth boundary.

2Cg—49 to 80 inches; greenish gray (5GY 6/1) silt loam; massive; friable; slightly alkaline.

Range in Characteristics

Thickness of the organic material: 16 to 50 inches

O horizon:
Hue—10YR, 5YR, or N
Value—2 or 3
Chroma—0 to 2
Texture—muck

2A horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—2 or 3
Chroma—0 or 1
Texture—loam, silt loam, sandy clay loam, or silty clay loam or the mucky analogs of these textures

2Cg horizon:
Hue—10YR, 2.5Y, 5Y, 5GY, or N
Value—2 to 7
Chroma—0 to 2
Texture—loam, silt loam, silty clay loam, clay loam, sandy clay loam, sandy loam, or fine sandy loam or the gravelly or cobbly analogs of these textures

Lawler Series

Typical Pedon

Lawler loam, 24 to 40 inches to sand and gravel, 0 to 2 percent slopes, in a cultivated field; 1,100 feet south and 1,200 feet east of the northwest corner of sec. 7, T. 87 N., R. 11 W.; USGS LaPorte City NE topographic quarter quadrangle; lat. 42 degrees 21 minutes 59.3 seconds N. and long. 92 degrees 10 minutes 37.4 seconds W., NAD 83:

Ap—0 to 7 inches; black (10YR 2/1) loam, very dark gray (10YR 3/1) dry; weak medium subangular blocky structure; friable; common very fine and fine roots; common very fine tubular pores; neutral; abrupt smooth boundary.

A—7 to 18 inches; black (10YR 2/1) loam, very dark gray (10YR 3/1) dry; weak fine and medium subangular blocky structure; friable; common very fine roots; common very fine tubular pores; neutral; clear smooth boundary.

Bg1—18 to 26 inches; dark grayish brown (2.5Y 4/2) loam; weak fine and medium subangular blocky structure; friable; few very fine roots; common very fine tubular pores; common fine and medium prominent strong brown (7.5YR 4/6) redoximorphic concentrations; moderately acid; clear smooth boundary.

Bg2—26 to 33 inches; dark grayish brown (10YR 4/2) sandy clay loam; weak medium subangular blocky structure; friable; few very fine roots; few very fine tubular pores; common fine and medium prominent strong brown (7.5YR 4/6) redoximorphic concentrations; moderately acid; clear smooth boundary.

2C1—33 to 48 inches; brown (7.5YR 5/4) gravelly loamy sand; single grain; loose; common fine and medium faint brown (7.5YR 4/4) redoximorphic concentrations; about 25 percent mixed gravel; moderately acid; gradual smooth boundary.

2C2—48 to 80 inches; about 80 percent brown (7.5YR 5/4) and 20 percent grayish brown (2.5Y 5/2) gravelly sand; single grain; loose; about 20 percent mixed gravel; moderately acid.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Depth to sandy material: 24 to 40 inches

Ap and A horizons:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—loam or silt loam

Bg horizon:
Hue—2.5Y or 10YR
Value—4 to 6
Chroma—2 to 6
Texture—loam or sandy clay loam

2C horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 8
Chroma—1 to 6
Texture—gravelly loamy sand, gravelly sand, very gravelly sand, or loamy coarse sand

Lilah Series

Typical Pedon

Lilah sandy loam, 2 to 9 percent slopes, in a cultivated field; 600 feet south and 350 feet east of the northwest corner of sec. 2, T. 89 N., R. 11 W.; USGS Littleton SW topographic quarter quadrangle; lat. 42 degrees 33 minutes 12.96 seconds N. and long. 92 degrees 07 minutes 11.28 seconds W., NAD 83:

Ap—0 to 7 inches; very dark brown (10YR 2/2) sandy loam, dark grayish brown (10YR 4/2) dry; weak fine granular structure; friable; common fine roots; neutral; abrupt smooth boundary.

Bt1—7 to 15 inches; brown (7.5YR 4/4) gravelly sandy loam; weak fine granular structure; friable; common fine roots; few prominent discontinuous very dark brown (10YR 4/2) clay films; about 15 percent subrounded mixed gravel; neutral; abrupt smooth boundary.

2Bt2—15 to 25 inches; brown (7.5YR 5/4) gravelly loamy sand; weak fine and medium subangular blocky structure; friable; common fine roots; few prominent discontinuous very dark brown (10YR 4/4) clay films; about 15 percent subrounded mixed gravel; slightly acid; clear smooth boundary.

2Bt3—25 to 36 inches; brown (7.5YR 4/4) gravelly loamy sand; single grain; loose; common fine roots; few prominent discontinuous very dark grayish brown (10YR 4/3) clay films; about 15 percent mixed gravel; slightly acid; gradual smooth boundary.

2C—36 to 80 inches; strong brown (7.5YR 5/6) gravelly coarse sand; single grain; loose; about 25 percent mixed gravel and 5 percent mixed cobbles; moderately acid.

Range in Characteristics

Depth to sandy material: 12 to 20 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture—sandy loam

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

2Bt horizon:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—3 to 8
Texture—loamy sand, sand, gravelly loamy sand, or gravelly sand

2C horizon:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—4 to 8
Texture—loamy sand, sand, or coarse sand or the gravelly analogs of these textures

Lourdes Series

Typical Pedon

Lourdes loam, 2 to 5 percent slopes, in a cultivated field; 800 feet north and 1,800 feet west of the southeast corner of sec. 8, T. 90 N., R. 14 W.; USGS New Hartford NE topographic quarter quadrangle; lat. 42 degrees 36 minutes 58.7 seconds N. and long. 92 degrees 30 minutes 51.3 seconds W., NAD 83:

Ap—0 to 8 inches; black (10YR 2/1) and very dark brown (10YR 2/2) loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; neutral; abrupt smooth boundary.

BE—8 to 15 inches; brown (10YR 4/3) loam; weak fine subangular blocky structure; friable; common faint discontinuous dark brown (10YR 3/3) organic coatings on faces of peds; discontinuous stone line consisting of rounded gravel and cobbles 1 to 6 inches in diameter (5 to 10 percent of this horizon); slightly acid; clear smooth boundary.

2Bt1—15 to 22 inches; dark yellowish brown (10YR 4/4) clay loam; weak fine and medium subangular blocky structure; firm; few faint discontinuous very dark grayish brown (10YR 4/3) clay films on faces of peds; about 5 percent mixed gravel; slightly acid; clear smooth boundary.

2Bt2—22 to 30 inches; strong brown (7.5YR 5/6) clay loam; moderate fine and medium subangular blocky structure; very firm; few distinct discontinuous very dark grayish brown (10YR 4/3) clay films on faces of peds; about 5 percent mixed gravel; few fine prominent grayish brown (10YR 5/2) redoximorphic depletions; moderately acid; gradual smooth boundary.

2Bt3—30 to 37 inches; about 70 percent strong brown (7.5YR 5/6) and 30 percent grayish brown (10YR 5/2) clay loam; moderate fine prismatic structure; very firm; few distinct discontinuous very dark grayish brown (10YR 4/3) clay films on faces of peds; common fine black (10YR 2/1) masses of iron-manganese; about 10 percent mixed gravel; slightly acid; gradual smooth boundary.

2Bt4—37 to 52 inches; about 60 percent yellowish brown (10YR 5/6) and 40 percent grayish brown (10YR 5/2) clay loam; moderate fine prismatic structure; very firm; common fine very dark brown (10YR 2/2) masses of iron-manganese; very few distinct discontinuous very dark grayish brown (10YR 4/3) clay films on faces of peds; about 10 percent subrounded mixed gravel; common fine and medium distinct strong brown (7.5YR 5/6) redoximorphic concentrations; slightly acid; gradual smooth boundary.

2C—52 to 80 inches; about 60 percent yellowish brown (10YR 5/6) and 40 percent grayish brown (10YR 5/2) clay loam; massive; very firm; neutral.

Range in Characteristics

Depth to till: 12 to 22 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—loam or silt loam

BE horizon:
Hue—10YR
Value—4
Chroma—3 or 4
Texture—loam or silt loam; a stone line is commonly at the lower boundary of this horizon

2Bt horizon:
Hue—7.5YR, 10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 8
Texture—clay loam

2C horizon:
Hue—7.5YR, 10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 8
Texture—clay loam

Marquis Series

Typical Pedon

Marquis loam, 2 to 5 percent slopes, in a cultivated field; 100 feet north and 100 feet east of the southwest corner of sec. 17, T. 90 N., R. 12 W.; USGS Waterloo North topographic quadrangle; lat. 42 degrees 35 minutes 59.5 seconds N. and long. 92 degrees 17 minutes 50.5 seconds W., NAD 83:

Ap—0 to 9 inches; black (10YR 2/1) loam, very dark gray (10YR 3/1) dry; weak fine granular structure; friable; common fine roots; common very fine tubular pores; neutral; clear smooth boundary.

A—9 to 19 inches; very dark brown (10YR 2/2) and very dark grayish brown (10YR 3/2) loam, dark grayish brown (10YR 4/2) dry; weak fine subangular blocky structure; friable; common fine roots; common very fine tubular pores; neutral; clear smooth boundary.

Bw1—19 to 24 inches; brown (10YR 4/3) loam; weak fine subangular blocky structure; friable; few fine roots throughout; common very fine moderate-continuity tubular pores; common faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; discontinuous stone line consisting of rounded gravel and cobbles 1 to 6 inches in diameter (5 to 10 percent of this horizon); slightly acid; clear smooth boundary.

2Bw2—24 to 32 inches; yellowish brown (10YR 5/6) loam; moderate fine and medium subangular blocky structure; friable; few fine roots; few very fine tubular pores; about 2 percent mixed gravel; common fine and medium prominent grayish brown (2.5Y 5/2) redoximorphic depletions; slightly acid; gradual wavy boundary.

2Bw3—32 to 42 inches; yellowish brown (10YR 5/6) loam; moderate fine and medium subangular blocky structure; firm; common fine roots; common fine black (10YR 2/1) masses of iron-manganese; about 2 percent mixed gravel; common fine prominent grayish brown (2.5Y 5/2) redoximorphic depletions; slightly acid; gradual wavy boundary.

2Bw4—42 to 54 inches; yellowish brown (10YR 5/6) loam; moderate fine prismatic structure; firm; common fine very dark brown (10YR 2/2) masses of iron-manganese; about 2 percent mixed gravel; common fine and medium prominent grayish brown (2.5Y 5/2) redoximorphic depletions; slightly acid; gradual wavy boundary.

2C—54 to 80 inches; strong brown (7.5YR 5/6) loam; massive; firm; common fine very dark brown (10YR 2/2) masses of iron-manganese; about 2 percent mixed gravel; common fine prominent gray (2.5Y 5/1) redoximorphic depletions; slightly acid.

Range in Characteristics

Thickness of the mollic epipedon: 12 to 20 inches
Depth to till: 14 to 26 inches
Depth to carbonates: 45 to more than 80 inches

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

Bw horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—2 to 6
Texture—loam, silt loam, clay loam, or sandy clay loam; a stone line is commonly at the lower boundary of this horizon

2Bw horizon:
Hue—7.5YR to 2.5Y
Value—4 to 6

Chroma—1 to 8
Texture—loam, clay loam, or sandy clay loam; vertical seams or wedges of sand or loamy sand 2 to 6 inches wide throughout the horizon in some pedons

2BC or 2C horizon:
Hue—7.5YR to 2.5Y
Value—4 to 6
Chroma—1 to 8
Texture—loam, clay loam, or sandy clay loam; vertical seams or wedges of sand or loamy sand 2 to 6 inches wide throughout the horizon in some pedons

Marshan Series

Typical Pedon

Marshan clay loam, 24 to 40 inches to sand and gravel, 0 to 2 percent slopes, in a cultivated field; 150 feet north and 1,100 feet east of the southwest corner of sec. 23, T. 89 N., R. 12 W.; USGS Gilbertville NW topographic quarter quadrangle; lat. 42 degrees 29 minutes 54.4 seconds N. and long. 92 degrees 14 minutes 05.7 seconds W., NAD 83:

Ap—0 to 9 inches; black (10YR 2/1) clay loam, very dark gray (10YR 3/1) dry; weak fine granular structure; friable; common fine roots; common fine tubular pores; slightly acid; abrupt smooth boundary.

A—9 to 18 inches; black (10YR 2/1) clay loam, dark gray (10YR 4/1) dry; weak fine subangular blocky structure; friable; common fine roots; common fine tubular pores; moderately acid; clear smooth boundary.

Bg1—18 to 26 inches; dark gray (2.5Y 4/1) clay loam; weak fine subangular blocky structure; friable; few fine roots; common fine tubular pores; common distinct discontinuous very dark gray (10YR 3/1) organic coatings on faces of peds; common fine and medium prominent strong brown (7.5YR 4/6) redoximorphic concentrations; moderately acid; clear smooth boundary.

Bg2—26 to 34 inches; gray (2.5Y 5/1) clay loam; weak fine subangular blocky structure; friable; common fine tubular pores; many coarse prominent strong brown (7.5Y 5/6) redoximorphic concentrations; moderately acid; clear smooth boundary.

2C1—34 to 51 inches; gray (10YR 6/1) sand; single grain; loose; about 3 percent mixed gravel; few fine prominent strong brown (7.5YR 5/6) redoximorphic concentrations; neutral; gradual smooth boundary.

2C2—51 to 80 inches; light brownish gray (10YR 6/2) sand; single grain; loose; about 10 percent mixed gravel; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 12 to 24 inches
Depth to sandy material: 24 to 40 inches

Ap and A horizons:
Hue—10YR, 2.5Y, 5Y, or N
Value—2 or 3
Chroma—0 to 2
Texture—loam, clay loam, silty clay loam, or silt loam

Bg horizon:
Hue—2.5Y or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—loam, clay loam, sandy loam, silty clay loam, or silt loam

2C horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 6
Texture—sand, loamy sand, gravelly sand, or gravelly loamy sand

Maxfield Series

Typical Pedon

Maxfield silty clay loam, 0 to 2 percent slopes, in a cultivated field; 1,700 feet west and 1,340 feet north of the southeast corner of sec. 5, T. 89 N., R. 14 W.; USGS New Hartford SE topographic quarter quadrangle; lat. 42 degrees 32 minutes 45.8 seconds N. and long. 92 degrees 31 minutes 16.1 seconds W., NAD 83:

Ap—0 to 8 inches; black (N 2/0) silty clay loam, black (10YR 2/1) dry; weak medium subangular blocky structure; friable; common very fine and fine roots; common very fine tubular pores; neutral; abrupt smooth boundary.

A1—8 to 13 inches; black (N 2/0) silty clay loam, black (10YR 2/1) dry; weak fine and medium subangular blocky structure; friable; common very fine roots; common very fine tubular pores; neutral; clear smooth boundary.

A2—13 to 19 inches; very dark gray (10YR 3/1) silty clay loam, dark gray (10YR 4/1) dry; weak fine and medium subangular blocky structure; friable; few very fine roots; common very fine tubular pores; few fine distinct dark grayish brown (2.5Y

4/2) redoximorphic depletions; neutral; clear smooth boundary.

Bg—19 to 28 inches; dark grayish brown (2.5Y 4/2) silty clay loam; weak fine and medium subangular blocky structure; friable; few very fine roots; common very fine tubular pores; common faint discontinuous dark gray (2.5Y 4/1) coatings on faces of peds; discontinuous stone line consisting of rounded gravel and cobbles 1 to 6 inches in diameter (5 to 10 percent of this horizon); few fine prominent strong brown (7.5YR 5/6) redoximorphic concentrations; neutral; abrupt smooth boundary.

2Bw1—28 to 34 inches; olive brown (10YR 5/4) loam; weak coarse subangular blocky structure; very friable; common medium distinct dark grayish brown (2.5Y 4/2) redoximorphic depletions; neutral; clear smooth boundary.

2Bw2—34 to 48 inches; yellowish brown (10YR 5/6) loam; weak medium prismatic structure; firm; many medium prominent gray (2.5Y 6/2) redoximorphic depletions; neutral; clear smooth boundary.

2Cg—48 to 80 inches; gray (2.5Y 6/2) and yellowish brown (10YR 5/6) loam; massive; firm; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 14 to 24 inches
Depth to till: 20 to 40 inches

Ap and A horizons:
Hue—10YR or N
Value—2 or 3
Chroma—0 or 1
Texture—silty clay loam or silt loam

Bg horizon:
Hue—2.5Y or 5Y
Value—4 or 5
Chroma—2
Texture—silty clay loam or silt loam; a stone line is commonly at the lower boundary of this horizon

2Bw horizon:
Hue—10YR or 7.5YR
Value—5
Chroma—4 to 8
Texture—loam or clay loam

2Cg horizon:
Hue—2.5Y, 10YR, or 7.5YR
Value—5 or 6
Chroma—2 to 8
Texture—loam or clay loam

Maxmore Series

Typical Pedon

Maxmore silty clay loam, 0 to 2 percent slopes, in a cultivated field; 300 feet south and 1,700 feet east of the northwest corner of sec. 29, T. 87 N., R. 14 W.; USGS Reinbeck NE topographic quarter quadrangle; lat. 42 degrees 19 minutes 31.14 seconds N. and long. 92 degrees 30 minutes 29.33 seconds W., NAD 83:

Ap—0 to 8 inches; black (N 2/0) silty clay loam, black (10YR 2/1) dry; weak medium subangular blocky structure; friable; common fine roots; common very fine tubular pores; neutral; clear smooth boundary.

A1—8 to 14 inches; black (N 2/0) silty clay loam, black (10YR 2/1) dry; weak fine subangular blocky structure; friable; common very fine roots; common very fine tubular pores; neutral; gradual smooth boundary.

A2—14 to 20 inches; very dark gray (10YR 3/1) silty clay loam, dark gray (10YR 4/1) dry; weak fine subangular blocky structure; friable; few very fine roots; common very fine tubular pores; neutral; gradual smooth boundary.

Btg1—20 to 26 inches; dark gray (2.5Y 4/1) silty clay loam; weak medium subangular blocky structure; friable; few very fine roots; common very fine tubular pores; few distinct clay films on vertical faces of peds; few fine prominent brown (7.5YR 4/4) iron concentrations; slightly acid; gradual smooth boundary.

Btg2—26 to 36 inches; dark gray (2.5Y 4/1) silty clay loam; weak medium subangular blocky structure; friable; few very fine roots; common very fine tubular pores; few distinct clay films on vertical faces of peds; common fine prominent yellowish red (5YR 4/6) redoximorphic concentrations; neutral; gradual smooth boundary.

Btg3—36 to 44 inches; dark gray (5Y 4/1) silty clay loam; weak medium subangular blocky structure; friable; common very fine tubular pores; few distinct clay films on vertical faces of peds; common fine prominent yellowish red (5YR 4/6) redoximorphic concentrations; neutral; gradual smooth boundary.

Btg4—44 to 50 inches; olive brown (5Y 5/1) silty clay loam; weak medium prismatic structure; friable; common very fine tubular pores; few distinct clay films on vertical faces of peds; discontinuous stone line consisting of rounded gravel and cobbles 1 to 6 inches in diameter (5 to 10 percent of this horizon); common fine prominent yellowish red (5YR 4/6) redoximorphic concentrations; neutral; gradual smooth boundary.

2BC—50 to 80 inches; about 50 percent yellowish brown (10YR 5/6) and 50 percent grayish brown (2.5Y 5/2) loam; massive; friable; few very fine tubular pores; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 14 to 24 inches
Depth to till: 40 to 60 inches
Depth to carbonates: 40 to more than 80 inches

Ap and A horizons:
Hue—10YR or N
Value—2 or 3
Chroma—0 to 2
Texture—silty clay loam or silt loam

Btg horizon:
Hue—2.5Y or 5Y
Value—4 or 5
Chroma—1 or 2
Texture—silty clay loam; a stone line is commonly at the lower boundary of this horizon

2BC or 2C horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—1 to 8
Texture—loam, clay loam, or sandy clay loam

Nevin Series

Typical Pedon

Nevin silty clay loam, 0 to 2 percent slopes, in a cultivated field; 1,300 feet east and 1,350 feet south of the northwest corner of sec. 6, T. 87 N., R. 14 W.; USGS Zaneta SE topographic quarter quadrangle; lat. 42 degrees 22 minutes 51.7 seconds N. and long. 92 degrees 31 minutes 44.9 seconds W., NAD 83:

Ap—0 to 8 inches; black (10YR 2/1) silty clay loam, very dark gray (10YR 3/1) dry; weak medium subangular blocky structure; friable; common very fine and fine roots; common very fine tubular pores; neutral; abrupt smooth boundary.

A1—8 to 14 inches; black (10YR 2/1) silty clay loam, very dark gray (10YR 3/1) dry; moderate fine subangular blocky structure parting to moderate fine granular; friable; common very fine roots; common very fine tubular pores; neutral; clear smooth boundary.

A2—14 to 22 inches; very dark gray (10YR 3/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine and medium subangular blocky structure; friable; few very fine roots; common very fine tubular pores; neutral; clear smooth boundary.

Btg1—22 to 30 inches; dark grayish brown (10YR 4/2) silty clay loam; moderate fine and medium subangular blocky structure; friable; few very fine roots; common very fine tubular pores; common faint discontinuous dark gray (10YR 4/1) clay films on faces of peds; few fine distinct dark yellowish brown (10YR 4/4) redoximorphic concentrations; neutral; clear smooth boundary.

Btg2—30 to 41 inches; dark grayish brown (2.5Y 4/2) silty clay loam; moderate fine and medium subangular blocky structure; friable; common very fine tubular pores; common distinct discontinuous dark gray (10YR 4/1) clay films on faces of peds; common fine prominent brown (7.5YR 4/4) redoximorphic concentrations; neutral; gradual smooth boundary.

Btg3—41 to 50 inches; grayish brown (2.5Y 5/2) silty clay loam; moderate medium subangular blocky structure; friable; common very fine tubular pores; common distinct discontinuous gray (10YR 5/1) clay films on faces of peds; many fine and medium prominent strong brown (7.5YR 5/6) redoximorphic concentrations; neutral; gradual smooth boundary.

BCg—50 to 62 inches; grayish brown (2.5Y 5/2) silt loam; weak coarse subangular blocky structure; friable; few distinct discontinuous gray (10YR 5/1) clay films on faces of peds; many fine and medium prominent strong brown (7.5YR 5/6) redoximorphic concentrations; neutral; gradual smooth boundary.

2Cg—62 to 80 inches; olive gray (2.5Y 5/2) fine sand; single grain; loose; many fine and medium prominent strong brown (7.5YR 5/6) redoximorphic concentrations; neutral.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches
Depth to sandy alluvium: 60 to 80 inches
Depth to carbonates: More than 60 inches

Ap and A horizons:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silt loam or silty clay loam

Btg and BCg horizons:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—2 to 4
Texture—silty clay loam or silt loam

Cg horizon (if it occurs):
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 4
Texture—silty clay loam or silt loam

2Cg horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 4
Texture—fine sand, loamy sand, or sand or the gravelly analogs of these textures

Olin Series

Typical Pedon

Olin fine sandy loam, 2 to 5 percent slopes, in a cultivated field; 230 feet north and 270 feet west of the southeast corner of sec. 2, T. 89 N., R. 11 W.; USGS Littleton SW topographic quarter quadrangle; lat. 42 degrees 32 minutes 29.3 seconds N. and long. 92 degrees 06 minutes 11.6 seconds W., NAD 83:

Ap—0 to 8 inches; very dark brown (10YR 2/2) fine sandy loam, dark grayish brown (10YR 4/2) dry; weak medium subangular blocky structure; very friable; common very fine and fine roots; neutral; abrupt smooth boundary.

A—8 to 19 inches; very dark brown (10YR 2/2) fine sandy loam, dark grayish brown (10YR 4/2) dry; weak fine and medium subangular blocky structure; very friable; common very fine roots; slightly acid; clear smooth boundary.

Bw1—19 to 25 inches; brown (10YR 4/3) sandy loam; weak medium subangular blocky structure; very friable; few very fine roots; few faint discontinuous dark brown (10YR 3/3) organic coatings on faces of peds; moderately acid; clear smooth boundary.

Bw2—25 to 31 inches; dark yellowish brown (10YR 4/4) sandy loam; weak medium subangular blocky structure; very friable; few very fine roots; discontinuous stone line consisting of rounded gravel and cobbles 1 to 6 inches in diameter (5 to 10 percent of this horizon); strongly acid; clear smooth boundary.

2Bw3—31 to 53 inches; 60 percent strong brown (10YR 4/6) and 40 percent gray (10YR 5/3) loam; weak medium prismatic structure; firm; common fine dark reddish brown (5YR 3/2) masses of iron-manganese; moderately acid; gradual smooth boundary.

2C1—53 to 67 inches; strong brown (7.5YR 5/6) loam; massive; firm; common fine strong brown (7.5YR 2/2) masses of iron-manganese; common medium prominent gray (2.5Y 6/2) redoximorphic depletions; slightly acid; gradual smooth boundary.

2C2—67 to 80 inches; strong brown (7.5YR 5/6) loam; massive; firm; common fine strong brown (7.5YR 2/2) masses of iron-manganese; neutral.

Range in Characteristics

Thickness of the mollic epipedon: 16 to 20 inches
Depth to till: 24 to 36 inches

Ap and A horizons:
Hue—10YR
Value—2 or 3
Chroma—2
Texture—sandy loam or fine sandy loam

Bw horizon:
Hue—10YR
Value—4 or 5
Chroma—3 or 4
Texture—sandy loam or loamy sand; a stone line is commonly at the lower boundary of this horizon

2Bw horizon:
Hue—10YR
Value—4 or 5
Chroma—3 to 6
Texture—loam, clay loam, or sandy clay loam

2C horizon:
Hue—10YR or 7.5YR
Value—4 to 6
Chroma—4 to 8
Texture—loam or clay loam

Oran Series

Typical Pedon

Oran loam, 1 to 3 percent slopes, in a cultivated field; 940 feet south and 2,570 feet east of the northwest corner of sec. 2, T. 90 N., R. 11 W.; USGS Fairbank SW topographic quarter quadrangle; lat. 42 degrees 38 minutes 22.1 seconds N. and long. 92 degrees 06 minutes 40.7 seconds W., NAD 83:

Ap—0 to 9 inches; very dark brown (10YR 2/2) loam, very dark grayish brown (10YR 3/2) dry; weak fine granular structure; friable; common fine roots; common fine tubular pores; neutral; abrupt smooth boundary.

BE—9 to 16 inches; olive brown (10YR 4/3) loam; weak thin platy and weak fine subangular blocky structure; friable; common very fine roots; common very fine tubular pores; common fine faint light olive brown (2.5Y 5/4) redoximorphic concentrations; slightly acid; clear smooth boundary.

Bt1—16 to 23 inches; dark yellowish brown (10YR 4/6) sandy clay loam; weak fine subangular blocky structure; friable; few very fine roots; common very fine tubular pores; few faint thin very dark yellowish brown (10YR 4/4) clay films on faces of peds; about 2 percent rounded mixed gravel; discontinuous stone line consisting of rounded gravel and cobbles 1 to 6 inches in diameter (5 to 10 percent of this horizon); moderately acid; clear smooth boundary.

2Bt2—23 to 44 inches; grayish brown (10YR 5/2) and yellowish brown (10YR 5/6) clay loam; moderate fine prismatic structure; firm; few very fine roots; few very fine tubular pores; few faint thin very dark grayish brown (10YR 5/1) clay films on faces of peds; common fine black (10YR 2/1) masses of iron-manganese; strongly acid; clear smooth boundary.

2Bt3—44 to 54 inches; grayish brown (10YR 5/2) and yellowish brown (10YR 5/6) clay loam; moderate medium prismatic structure; firm; few faint thin gray (10YR 5/1) clay films on faces of peds; common fine black (10YR 2/1) masses of iron-manganese; moderately acid; gradual smooth boundary.

2C—54 to 80 inches; yellowish brown (10YR 5/6) loam; massive; firm; common fine black (10YR 2/1) masses of iron-manganese; many medium prominent grayish brown (10YR 5/2) redoximorphic depletions; neutral.

Range in Characteristics

Depth to till: 14 to 24 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—loam or silt loam

E or BE horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—2 or 3
Texture—loam or silt loam

Bt horizon:
Hue—10YR
Value—4 or 5
Chroma—4 to 6
Texture—sandy clay loam or loam; a stone line is commonly at the lower boundary of this horizon

2Bt or 2BC horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—2 to 8
Texture—loam, clay loam, or sandy clay loam

2C horizon:
Hue—7.5YR or 10YR
Value—5
Chroma—6
Texture—loam, clay loam, or sandy clay loam

Protivin Series

Typical Pedon

Protivin loam, 1 to 3 percent slopes, in a cultivated field; 820 feet north and 480 feet east of the southwest corner of sec. 5, T. 89 N., R. 12 W.; USGS Waterloo North SE topographic quarter quadrangle; lat. 42 degrees 32 minutes 39.9 seconds N. and long. 92 degrees 17 minutes 45.6 seconds W., NAD 83:

Ap—0 to 7 inches; black (10YR 2/1) loam, very dark gray (10YR 3/1) dry; weak medium subangular blocky structure; friable; common very fine and fine roots; common very fine tubular pores; slightly acid; abrupt smooth boundary.

A1—7 to 13 inches; black (10YR 2/1) clay loam, very dark gray (10YR 3/1) dry; moderate fine and medium subangular blocky structure; friable; common very fine roots; common very fine tubular pores; slightly acid; clear smooth boundary.

A2—13 to 19 inches; very dark gray (10YR 3/1) clay loam, dark gray (10YR 4/1) dry; moderate fine and medium subangular blocky structure; friable; few very fine roots; common very fine tubular pores; discontinuous stone line consisting of rounded gravel and cobbles 1 to 6 inches in diameter (5 to 10 percent of this horizon); moderately acid; clear smooth boundary.

2Btg1—19 to 30 inches; dark grayish brown (10YR 4/2) clay loam; moderate medium subangular blocky structure; very firm; few very fine roots; few faint discontinuous very dark gray (10YR 3/1) clay films on faces of peds; slightly acid; clear smooth boundary.

2Btg2—30 to 36 inches; dark grayish brown (2.5Y 4/2) and dark yellowish brown (10YR 4/4) clay loam; moderate medium subangular blocky structure; very firm; few distinct discontinuous very dark gray (10YR 3/1) clay films on faces of peds; neutral; clear smooth boundary.

2Btg3—36 to 43 inches; grayish brown (2.5Y 5/2) clay loam; weak medium subangular blocky structure;

very firm; few distinct discontinuous very dark gray (10YR 3/1) clay films on faces of peds; neutral; gradual smooth boundary.

2BC—43 to 62 inches; dark grayish brown (2.5Y 4/2) and dark yellowish brown (10YR 4/4) clay loam; weak medium subangular blocky structure; very firm; neutral; gradual smooth boundary.

2C—62 to 80 inches; dark grayish brown (2.5Y 4/2) and dark yellowish brown (10YR 4/4) clay loam; massive; very firm; neutral.

Range in Characteristics

Thickness of the mollic epipedon: 12 to 20 inches
Depth to till: 14 to 28 inches

Ap and A horizons:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—loam, clay loam, or silt loam; a stone line is commonly at the lower boundary of this horizon

2Btg horizon:
Hue—7.5YR, 10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 8
Texture—clay loam

2BC and 2C horizons:
Hue—7.5YR, 10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 8
Texture—clay loam

Readlyn Series

Typical Pedon

Readlyn loam, 1 to 3 percent slopes, in a cultivated field; 790 feet north and 130 feet west of the southeast corner of sec. 18, T. 90 N., R. 12 W.; USGS Waterloo North NE topographic quarter quadrangle; lat. 42 degrees 36 minutes 06.5 seconds N. and long. 92 degrees 17 minutes 54.1 seconds W., NAD 83:

Ap—0 to 8 inches; black (10YR 2/1) loam, very dark gray (10YR 3/1) dry; weak fine granular structure; friable; common fine roots; neutral; abrupt smooth boundary.

A—8 to 16 inches; black (10YR 2/1) loam, dark gray (10YR 4/1) dry; weak fine granular structure; friable; common fine roots; moderately acid; clear smooth boundary.

Bg—16 to 24 inches; dark grayish brown (10YR 4/2) loam; weak fine subangular blocky structure; friable; common fine roots; common faint continuous very dark grayish brown (10YR 3/2) stains on faces of peds and in pores; discontinuous stone line consisting of rounded gravel and cobbles 1 to 6 inches in diameter (5 to 10 percent of this horizon); moderately acid; clear smooth boundary.

2Bw1—24 to 31 inches; about 50 percent dark grayish brown (2.5Y 4/2) and 50 percent olive brown (2.5Y 4/4) clay loam; weak fine subangular blocky structure; friable; common fine roots; few distinct discontinuous very dark grayish brown (10YR 3/2) stains on faces of peds and in pores; strongly acid; gradual smooth boundary.

2Bw2—31 to 40 inches; about 50 percent light olive brown (2.5Y 5/6) and 50 percent grayish brown (2.5Y 5/2) loam; moderate fine subangular blocky structure; firm; common fine roots; about 2 percent mixed gravel; moderately acid; gradual wavy boundary.

2Bw3—40 to 52 inches; about 50 percent yellowish brown (10YR 5/6) and 50 percent grayish brown (10YR 5/2) loam; moderate fine and medium subangular blocky structure; firm; common fine roots; about 2 percent mixed gravel; neutral; gradual wavy boundary.

2C—52 to 80 inches; yellowish brown (10YR 5/8) loam; massive; firm; common fine light gray (10YR 7/1) soft carbonate threads; about 2 percent mixed gravel; common fine and medium prominent grayish brown (2.5YR 5/2) redoximorphic depletions; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 14 to 20 inches
Depth to till: 14 to 26 inches

Ap and A horizons:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—loam, clay loam, silty clay loam, or silt loam

Bg or Bw horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—2 to 4
Texture—loam, clay loam, silty clay loam, or silt loam; a stone line is commonly at the lower boundary of this horizon

2Bw horizon:
Hue—10YR or 2.5Y
Value—4 or 5

Chroma—2 to 8
Texture—loam, clay loam, or sandy clay loam

2C horizon:
Hue—10YR or 7.5YR
Value—5
Chroma—3 to 8
Texture—loam or sandy clay loam

Riceville Series

Typical Pedon

Riceville loam, 1 to 4 percent slopes, in a cultivated field; Howard County, Iowa; 510 feet west and 73 feet south of the northeast corner of sec. 25, T. 99 N., R. 13 W.; USGS Lourdes NW topographic quarter quadrangle; lat. 43 degrees 22 minutes 14.0 seconds N. and long. 92 degrees 19 minutes 07.98 seconds W., NAD 83:

Ap—0 to 6 inches; black (10YR 2/1) loam, very dark brown (10YR 2/2) kneaded, dark gray (10YR 4/1) dry; moderate fine granular structure; friable; many roots; strongly acid; abrupt smooth boundary.

E—6 to 9 inches; dark grayish brown (10YR 4/2) loam; weak medium platy structure parting to weak fine subangular blocky; friable; discontinuous very dark grayish brown (10YR 3/2) coatings and some mixing of very dark brown (10YR 2/2); few fine faint dark yellowish brown (10YR 4/4) redoximorphic concentrations; very strongly acid; clear smooth boundary.

EB—9 to 15 inches; dark grayish brown (2.5Y 4/2) and brown (10YR 4/3) loam; weak fine subangular blocky structure; friable; discontinuous dark grayish brown (2.5Y 4/2) silt and very fine sand coatings on faces of peds; common fine faint dark yellowish brown (10YR 4/4) redoximorphic concentrations; very strongly acid; gradual smooth boundary.

Bt1—15 to 20 inches; dark grayish brown (2.5Y 4/2) clay loam; weak fine subangular blocky structure; firm; few thin discontinuous clay films; nearly continuous dark grayish brown (2.5Y 4/2) silt and very fine sand coatings on faces of peds; pebble band at a depth of 20 inches; common fine prominent yellowish brown (10YR 5/6) redoximorphic concentrations; very strongly acid; clear smooth boundary.

2Bt2—20 to 27 inches; mottled gray (5Y 5/1) and yellowish brown (10YR 5/6) clay loam; gray (5Y 5/1) on faces of peds; moderate medium subangular blocky structure; very firm; few thin discontinuous clay films; some pebbles; few fine prominent strong brown (7.5YR 5/8) redoximorphic concentrations; very strongly acid; clear wavy boundary.

2Bt3—27 to 42 inches; mottled gray (5Y 5/1) and yellowish brown (10YR 5/6) clay loam; moderate coarse prismatic structure parting to moderate medium subangular blocky; very firm; faces of large prisms and smaller peds are gray (5Y 5/1) in very thin coatings with a few sand grains showing through; few thin discontinuous very dark gray (N 3/0) clay films on faces of prisms and peds in the upper part and in a few root channels; some pebbles; few fine prominent strong brown (7.5YR 5/8) redoximorphic concentrations; strongly acid; clear wavy boundary.

2BC—42 to 60 inches; mottled gray (5Y 5/1) and yellowish brown (10YR 5/8) clay loam; weak coarse prismatic structure parting to weak coarse subangular blocky; firm; some pebbles; slightly effervescent; slightly alkaline.

Range in Characteristics

Depth to till: 14 to 24 inches
Depth to carbonates: 30 to 50 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—loam or silt loam

E and EB horizons:
Hue—10YR or 2.5Y
Value—3 to 5
Chroma—2
Texture—loam or silt loam

Bt horizon:
Hue—10YR or 2.5Y
Value—4
Chroma—2 or 3
Texture—clay loam

2Bt horizon:
Hue—10YR, 7.5YR, 2.5Y, or 5Y
Value—5 or 6
Chroma—1 to 8
Texture—clay loam

2C horizon (if it occurs):
Hue—10YR, 7.5YR, 2.5Y, or 5Y
Value—5 or 6
Chroma—1 to 8
Texture—clay loam

Rockton Series

Typical Pedon

Rockton loam, 30 to 40 inches to limestone, 2 to 5 percent slopes, in a grass field; 130 feet north and 1,150 feet east of the southwest corner of sec. 23, T. 87 N., R. 12 W.; USGS LaPorte City NW topographic quarter quadrangle; lat. 42 degrees 19 minutes 37 seconds N. and long. 92 degrees 12 minutes 59 seconds W., NAD 83:

A—0 to 13 inches; very dark brown (10YR 2/2) loam, dark grayish brown (10YR 4/2) dry; moderate fine granular structure; friable; many very fine and fine roots; many very fine tubular pores; neutral; gradual smooth boundary.

Bt1—13 to 21 inches; brown (10YR 4/3) loam; weak fine subangular blocky structure; friable; common very fine roots; common very fine tubular pores; common faint discontinuous dark brown (10YR 3/3) clay films on faces of peds; slightly acid; clear smooth boundary.

Bt2—21 to 28 inches; dark yellowish brown (10YR 4/4) loam; weak fine subangular blocky structure; friable; common very fine roots; common very fine tubular pores; common faint discontinuous brown (10YR 4/3) clay films on faces of peds; slightly acid; gradual smooth boundary.

Bt3—28 to 33 inches; yellowish brown (10YR 5/4) sandy clay loam; weak medium subangular blocky structure; friable; few very fine roots; common very fine tubular pores; few faint discontinuous dark yellowish brown (10YR 4/4) clay films on faces of peds; slightly acid; clear smooth boundary.

2R—33 inches; limestone bedrock.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 18 inches
Depth to bedrock: 30 to 40 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—loam, fine sandy loam, or silt loam

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

Sattre Series

Typical Pedon

Sattre loam, 0 to 2 percent slopes, in a hayfield; Benton County, Iowa; 550 feet east and 1,250 feet south of the center of sec. 2, T. 85 N., R. 10 W.; USGS Center Point Northwest NW topographic quarter quadrangle; lat. 42 degrees 11 minutes 57.0 seconds N. and long. 91 degrees 58 minutes 42.13 seconds W., NAD 83:

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

E—8 to 13 inches; dark grayish brown (10YR 4/2) loam; weak medium platy structure; friable; very dark grayish brown (10YR 3/2) organic coatings on vertical faces of peds; distinct light brownish gray (10YR 6/2) (dry) sand and silt coatings on vertical faces of peds; slightly acid; clear wavy boundary.

BE—13 to 17 inches; brown (10YR 4/3) loam; moderate medium subangular blocky structure parting to moderate fine subangular blocky; friable; dark brown (10YR 3/3) organic coatings on vertical faces of peds; slightly acid; gradual smooth boundary.

Bt1—17 to 24 inches; dark yellowish brown (10YR 4/4) loam; moderate medium angular and subangular blocky structure; friable; few distinct clay films on vertical faces of peds; clay-lined surfaces along pores and root channels; brown (10YR 4/3) organic coatings on vertical faces of peds; light brownish gray (10YR 6/2) (dry) silt and sand coatings on vertical faces of peds; moderately acid; gradual smooth boundary.

Bt2—24 to 32 inches; dark yellowish brown (10YR 4/4) loam; moderate medium angular and subangular blocky structure; friable; many distinct clay films on vertical faces of peds; dark brown (10YR 4/3) organic coatings on peds; moderately acid; clear smooth boundary.

BC—32 to 35 inches; yellowish brown (10YR 5/6) sandy loam; moderate coarse subangular blocky structure; friable; few distinct dark yellowish brown (10YR 4/3) clay films on vertical faces of peds; moderately acid; clear smooth boundary.

2E—35 to 40 inches; yellowish brown (10YR 5/6) sand; weak coarse subangular blocky structure; very friable; clay bridging between sand grains; moderately acid; gradual smooth boundary.

2E&Bt—40 to 60 inches; brownish yellow (10YR 6/6) sand (E); single grain; loose; lamellae of brown (7.5YR 5/4) sandy loam 1 inch thick (Bt) at depths of 45, 49, and 53 inches; about 10 percent gravel; moderately acid.

Range in Characteristics

Depth to sand and gravel: 32 to 40 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—loam

E and BE horizons:
Hue—10YR
Value—4
Chroma—2 or 3
Texture—loam

Bt horizon:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—3 to 6
Texture—loam, clay loam, or sandy clay loam

BC horizon (if it occurs):
Hue—10YR
Value—4 or 5
Chroma—4 to 6
Texture—sandy loam

2E horizon and E part of the 2E&Bt horizon:
Hue—10YR or 7.5YR
Value—5 or 6
Chroma—4 to 6
Texture—sand, coarse sand, gravelly sand, or gravelly coarse sand

Bt part of the 2E&Bt horizon:
Hue—7.5YR or 10YR
Value—5 or 6
Chroma—4 to 6
Texture—sandy loam or sandy clay loam

Saude Series

Typical Pedon

Saude loam, 0 to 2 percent slopes, in a cultivated field; 1,500 feet north and 450 feet west of the southeast corner of sec. 24, T. 88 N., R. 12 W.; USGS Gilbertville SE topographic quarter quadrangle; lat. 42 degrees 25 minutes 02.6 seconds N. and long. 92 degrees 10 minutes 55.4 seconds W., NAD 83:

Ap—0 to 8 inches; very dark brown (10YR 2/2) loam, very dark grayish brown (10YR 3/2) dry; weak medium subangular blocky structure; friable; common very fine and fine roots; common very fine tubular pores; moderately acid; abrupt smooth boundary.

A—8 to 16 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; weak fine and medium subangular blocky structure; friable; common very fine roots; common very fine tubular pores; moderately acid; clear smooth boundary.

Bw1—16 to 25 inches; brown (10YR 4/3) loam; weak fine and medium subangular blocky structure; friable; few very fine roots; common very fine tubular pores; common faint discontinuous dark brown (10YR 3/3) organic coatings on faces of peds; moderately acid; gradual smooth boundary.

Bw2—25 to 30 inches; dark yellowish brown (10YR 4/4) sandy loam; weak medium subangular blocky structure; very friable; few very fine roots; common faint discontinuous brown (10YR 4/3) organic coatings on faces of peds; moderately acid; clear smooth boundary.

2C1—30 to 42 inches; strong brown (7.5YR 5/6) loamy sand; single grain; loose; about 10 percent mixed gravel; moderately acid; gradual smooth boundary.

2C2—42 to 80 inches; yellowish brown (10YR 5/6) gravelly coarse sand; single grain; loose; about 20 percent mixed gravel; slightly acid.

Range in Characteristics

Thickness of the mollic epipedon: 11 to 16 inches
Depth to sand and gravel: 20 to 30 inches

Ap and A horizons:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—loam

Bw horizon:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—3 to 6
Texture—loam or sandy loam

2BC or 2C horizon:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—4 to 6
Texture—loamy sand, sand, or coarse sand or the gravelly analogs of these textures

Sawmill Series

Typical Pedon

Sawmill silty clay loam, 0 to 2 percent slopes, occasionally flooded, in a cultivated field; 900 feet north and 150 feet west of the southeast corner of sec. 18, T. 87 N., R. 13 W.; USGS Buckingham NE topographic quarter quadrangle; lat. 42 degrees 20 minutes 36 seconds N. and long. 92 degrees 23 minutes 49.3 seconds W., NAD 83:

Ap—0 to 10 inches; black (10YR 2/1) silty clay loam, very dark gray (10YR 3/1) dry; weak fine and medium subangular blocky structure; friable; common very fine and fine roots; common very fine tubular pores; neutral; abrupt smooth boundary.

A1—10 to 19 inches; very dark gray (10YR 3/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine subangular blocky structure parting to moderate fine granular; friable; common very fine roots; common very fine tubular pores; neutral; gradual smooth boundary.

A2—19 to 29 inches; very dark gray (10YR 3/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine subangular blocky structure; friable; few very fine roots; common very fine tubular pores; neutral; clear smooth boundary.

Bg1—29 to 35 inches; dark gray (2.5Y 4/1) silty clay loam; moderate fine subangular blocky structure; friable; few very fine roots; common very fine tubular pores; common distinct discontinuous very dark gray (10YR 3/1) organic coatings on faces of peds; neutral; clear smooth boundary.

Bg2—35 to 46 inches; dark grayish brown (2.5Y 4/2) silty clay loam; weak fine and medium subangular blocky structure; friable; common very fine tubular pores; few fine and medium very dark gray (7.5YR 3/1) masses of iron-manganese; common fine and medium prominent strong brown (7.5YR 5/6) redoximorphic concentrations; neutral; gradual smooth boundary.

Bg3—46 to 59 inches; grayish brown (2.5Y 5/2) silty clay loam; weak coarse subangular blocky structure; friable; few very fine tubular pores; common fine and medium prominent strong brown (7.5YR 5/6) redoximorphic concentrations; neutral; clear smooth boundary.

Cg—59 to 80 inches; grayish brown (2.5Y 5/2) clay loam; massive; friable; few fine prominent strong brown (7.5YR 5/6) redoximorphic concentrations; neutral.

Range in Characteristics

Thickness of the mollic epipedon: 24 to 36 inches

Ap and A horizons:
Hue—10YR, 2.5Y, 5Y, or N
Value—2 or 3
Chroma—0 to 2
Texture—silty clay loam

Bg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—3 to 6
Chroma—1 or 2
Texture—silty clay loam, clay loam, or loam

Cg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—3 to 6
Chroma—1 or 2
Texture—clay loam, sandy loam, silt loam, silty clay loam, or silty clay

Sigglekov Series

Typical Pedon

Sigglekov loam, in an area of Sigglekov-Fluvaquents, channeled-Aquents, ponded, complex, 0 to 2 percent slopes, frequently flooded; in a timbered area of bottom land; 2,450 feet north and 350 feet east of the southwest corner of sec. 23, T. 90 N., R. 11 W.; USGS Littleton NW topographic quarter quadrangle; lat. 42 degrees 35 minutes 34.30 seconds N. and long. 92 degrees 07 minutes 12.19 seconds W., NAD 83:

A—0 to 9 inches; about 50 percent very dark grayish brown (10YR 3/2) and 50 percent very dark gray (10YR 3/1) loam, dark grayish brown (10YR 4/2) dry; moderate fine granular structure; friable; common fine and medium roots; common fine tubular pores; neutral; clear smooth boundary.

C1—9 to 15 inches; dark yellowish brown (10YR 4/4) sandy loam; massive; very friable; common fine and medium roots; common fine prominent strong brown (7.5YR 5/8) redoximorphic concentrations; common fine distinct light brownish gray (10YR 6/2) redoximorphic depletions; neutral; clear smooth boundary.

C2—15 to 20 inches; strong brown (7.5YR 4/6) sand; single grain; loose; common fine roots; neutral; clear smooth boundary.

C3—20 to 35 inches; yellowish brown (10YR 5/4) sand; single grain; loose; neutral; clear smooth boundary.

C4—35 to 80 inches; yellowish brown (10YR 5/4) coarse sand; single grain; loose; neutral.

Range in Characteristics

A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture—loam, silt loam, or sandy loam

C horizon:
Hue—2.5Y, 10YR, or 7.5YR
Value—4 to 6
Chroma—1 to 6
Texture—loamy sand, sand, coarse sand, or sandy loam

Sparta Series

Typical Pedon

Sparta loamy fine sand, 2 to 5 percent slopes, in a cultivated field; 1,280 feet north and 320 feet east of the southwest corner of sec. 6, T. 90 N., R. 13 W.; USGS Waverly SE topographic quarter quadrangle; lat. 42 degrees 37 minutes 54.8 seconds N. and long. 92 degrees 26 minutes 05.9 seconds W., NAD 83:

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) loamy fine sand, dark grayish brown (10YR 4/2) dry; weak coarse subangular blocky structure; very friable; common very fine and fine roots; moderately acid; clear smooth boundary.

A—9 to 19 inches; very dark grayish brown (10YR 3/2) loamy fine sand, dark grayish brown (10YR 4/2) dry; weak coarse subangular blocky structure; very friable; common very fine roots; moderately acid; gradual smooth boundary.

Bw—19 to 38 inches; brown (7.5YR 4/4) loamy fine sand; weak coarse subangular blocky structure; very friable; few very fine roots; moderately acid; gradual smooth boundary.

C1—38 to 65 inches; brown (7.5YR 5/4) fine sand; single grain; loose; moderately acid; gradual smooth boundary.

C2—65 to 80 inches; brownish yellow (10YR 6/6) fine sand; single grain; loose; slightly acid.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches

Ap and A horizons:
Hue—10YR or 7.5YR
Value—2 or 3
Chroma—1 or 2
Texture—loamy fine sand, loamy sand, fine sand, or sand

Bw horizon:
Hue—10YR or 7.5YR
Value—3 to 6
Chroma—3 to 6
Texture—loamy fine sand, loamy sand, fine sand, or sand

C horizon:
Hue—10YR or 7.5YR
Value—4 to 6
Chroma—3 to 6
Texture—sand or fine sand

Spillville Series

Typical Pedon

Spillville loam, in an area of Spillville-Coland complex, 0 to 2 percent slopes, occasionally flooded, in a cultivated field; 2,100 feet north and 1,050 feet west of the southeast corner of sec. 19, T. 87 N., R. 11 W.; USGS LaPorte City NE topographic quarter quadrangle; lat. 42 degrees 19 minutes 55.8 seconds N. and long. 92 degrees 09 minutes 58.4 seconds W., NAD 83:

Ap—0 to 8 inches; black (10YR 2/1) loam, very dark gray (10YR 3/1) dry; weak medium subangular blocky structure; friable; many very fine and fine roots; common fine tubular pores; neutral; abrupt smooth boundary.

A1—8 to 15 inches; very dark brown (10YR 2/2) loam, very dark grayish brown (10YR 3/2) dry; weak fine and medium subangular blocky structure; friable; common very fine and fine roots; common very fine tubular pores; neutral; clear smooth boundary.

A2—15 to 22 inches; very dark brown (10YR 2/2) loam, very dark grayish brown (10YR 3/2) dry; weak fine and medium subangular blocky structure; friable; common very fine roots; common very fine tubular pores; neutral; clear smooth boundary.

A3—22 to 37 inches; very dark grayish brown (10YR 3/2) loam, dark grayish brown (10YR 4/2) dry; weak medium subangular blocky structure; friable; few very fine roots; common very fine tubular pores; neutral; clear smooth boundary.

A4—37 to 55 inches; very dark gray (10YR 3/1) loam; weak coarse subangular blocky structure; friable; few fine prominent dark yellowish brown (10YR 4/6) redoximorphic concentrations; neutral; clear smooth boundary.

C—55 to 80 inches; very dark gray (10YR 3/1) and light brownish gray (10YR 4/2), stratified loam and loamy sand; single grain; loose; few fine prominent dark yellowish brown (10YR 4/6) redoximorphic concentrations; neutral.

Range in Characteristics

Thickness of the mollic epipedon: More than 36 inches
Depth to carbonates: More than 40 inches

Ap and A horizons:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—loam or silt loam

C horizon:
Hue—10YR or 2.5Y
Value—3 or 4
Chroma—1 or 2
Texture—loam, sandy clay loam, sandy loam, or loamy sand

Tripoli Series

Typical Pedon

Tripoli clay loam, 0 to 2 percent slopes, in a cultivated field; 2,550 feet south and 800 feet west of the northeast corner of sec. 10, T. 90 N., R. 12 W.; USGS Dunkerton NW topographic quarter quadrangle; lat. 42 degrees 37 minutes 17.2 seconds N. and long. 92 degrees 14 minutes 27.9 seconds W., NAD 83:

Ap—0 to 8 inches; black (10YR 2/1) clay loam, very dark gray (10YR 3/1) dry; weak fine and medium subangular blocky structure; friable; common very fine and fine roots; common very fine tubular pores; neutral; abrupt smooth boundary.
A—8 to 17 inches; black (10YR 2/1) clay loam, very dark gray (10YR 3/1) dry; weak fine subangular blocky structure; friable; common very fine roots; common very fine tubular pores; neutral; clear smooth boundary.
Bg—17 to 26 inches; dark grayish brown (2.5Y 4/2) loam; weak fine subangular blocky structure; friable; few very fine roots; common very fine tubular pores; discontinuous stone line consisting of rounded gravel and cobbles 1 to 6 inches in diameter (5 to 10 percent of this horizon); common fine and medium prominent strong brown (7.5YR 5/6) redoximorphic concentrations; neutral; clear smooth boundary.
2Bw—26 to 41 inches; about 60 percent yellowish brown (10YR 5/6) and 40 percent yellowish brown (10YR 5/4) loam; weak medium subangular blocky structure; firm; few very fine roots; common very fine tubular pores; common fine and medium prominent strong brown (7.5YR 5/8) redoximorphic concentrations; neutral; abrupt smooth boundary.
2C1—41 to 63 inches; about 60 percent yellowish brown (10YR 5/6) and 40 percent brown (2.5Y 5/2) loam; massive; firm; common fine and medium masses of lime; common fine and medium prominent strong brown (7.5YR 5/8) redoximorphic concentrations; strongly effervescent; moderately alkaline; gradual smooth boundary.
2C2—63 to 80 inches; about 70 percent yellowish brown (10YR 5/6) and 30 percent grayish brown (10YR 5/2) loam; massive; firm; common fine and medium masses of lime; common fine and medium prominent strong brown (7.5YR 5/8) redoximorphic concentrations; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 14 to 20 inches
Depth to till: 18 to 28 inches
Depth to carbonates: 36 to 42 inches

Ap and A horizons:
Hue—10YR or N
Value—2 or 3
Chroma—0 or 1
Texture—clay loam or silty clay loam

Bg or Bw horizon:
Hue—10YR, 2.5Y, or 5Y
Value—3 to 5
Chroma—1 to 6
Texture—clay loam or loam; a stone line is commonly at the lower boundary of this horizon

2Bw horizon:
Hue—10YR, 2.5Y, or 5Y
Value—3 to 5
Chroma—1 to 6
Texture—loam, clay loam, or sandy clay loam

2C horizon:
Hue—10YR, 2.5Y, or 5Y
Value—3 to 5
Chroma—1 to 6
Texture—loam, clay loam, or sandy clay loam

Wapsie Series

Typical Pedon

Wapsie loam, 1 to 3 percent slopes, in a cultivated field; 230 feet north and 640 feet west of the southeast corner of sec. 15, T. 90 N., R. 11 W.; USGS Littleton

NW topographic quarter quadrangle; lat. 42 degrees 35 minutes 57.7 seconds N. and long. 92 degrees 07 minutes 28.5 seconds W., NAD 83:

Ap—0 to 8 inches; very dark brown (10YR 2/2) loam, very dark grayish brown (10YR 3/2) dry; weak medium subangular blocky structure; friable; common very fine and fine roots; common very fine tubular pores; neutral; abrupt smooth boundary.

BE—8 to 13 inches; brown (10YR 4/3) loam; weak fine and medium subangular blocky structure; friable; common very fine roots; common very fine tubular pores; neutral; clear smooth boundary.

Bt1—13 to 20 inches; dark yellowish brown (10YR 4/4) loam; weak fine and medium subangular blocky structure; very friable; few very fine roots; common very fine tubular pores; few faint discontinuous brown (10YR 4/3) clay films on faces of peds; slightly acid; clear smooth boundary.

Bt2—20 to 29 inches; yellowish brown (10YR 5/6) loam; weak medium subangular blocky structure; very friable; few very fine roots; few very fine tubular pores; few distinct discontinuous yellowish brown (10YR 5/4) clay films on faces of peds; slightly acid; clear smooth boundary.

2C1—29 to 36 inches; yellowish brown (10YR 5/4) loamy sand; single grain; loose; about 5 percent gravel; moderately acid; clear smooth boundary.

2C2—36 to 42 inches; brown (10YR 5/4) gravelly sand; single grain; loose; about 15 percent gravel; moderately acid; gradual smooth boundary.

2C3—42 to 80 inches; light yellowish brown (10YR 5/4) sand; single grain; loose; about 5 percent gravel; moderately acid.

Range in Characteristics

Depth to sand and gravel: 20 to 36 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—sandy loam, sandy clay loam, loam, or silt loam

BE or E horizon:
Hue—10YR
Value—4 or 5
Chroma—2 or 3
Texture—sandy loam, sandy clay loam, loam, or silt loam

Bt or BC horizon:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—3 to 8
Texture—sandy loam, sandy clay loam, or loam

2C horizon:
Hue—10YR or 7.5YR
Value—5
Chroma—4 to 6
Texture—loamy sand, sand, gravelly loamy sand, or gravelly sand

Watseka Series

Typical Pedon

Watseka loamy fine sand, 1 to 3 percent slopes; Buchanan County, Iowa; 2,013 feet east and 130 feet north of the southwest corner of sec. 31, T. 90 N., R. 10 W.; USGS Littleton NW topographic quarter quadrangle; lat. 42 degrees 33 minutes 17.80 seconds N. and long. 92 degrees 04 minutes 55.32 seconds W., NAD 83:

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) loamy fine sand, dark grayish brown (10YR 4/2) dry; weak fine granular structure; very friable; neutral; abrupt smooth boundary.

A—8 to 17 inches; very dark grayish brown (10YR 3/2) loamy fine sand, dark grayish brown (10YR 4/2) dry; weak coarse subangular blocky structure; very friable; slightly acid; clear smooth boundary.

Bg—17 to 23 inches; mottled grayish brown (2.5Y 5/2), dark grayish brown (10YR 4/2), and brown (7.5YR 4/4) loamy fine sand; weak coarse subangular blocky structure; very friable; slightly acid; gradual smooth boundary.

BCg—23 to 34 inches; brown (10YR 4/3) loamy fine sand; weak fine subangular blocky structure; very friable; common medium distinct grayish brown (2.5Y 5/2) and few medium distinct brown (7.5YR 4/2) redoximorphic depletions; a 1/4- to 1/2-inch reddish brown horizontal band at a depth of 29 inches; slightly acid; abrupt wavy boundary.

Cg—34 to 60 inches; light brownish gray (2.5Y 6/2) sand; single grain; loose; slightly acid.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture—loamy fine sand, loamy sand, fine sand, or sand

Bg or BCg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 7
Chroma—2 to 4
Texture—loamy fine sand, loamy sand, fine sand, or sand

Cg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 7
Chroma—1 to 4
Texture—loamy fine sand, loamy sand, fine sand, or sand

Waubeek Series

Typical Pedon

Waubeek silt loam, in an area of Waubeek-Urban land complex, 5 to 14 percent slopes; in a wooded area; 1,750 feet south and 250 feet west of the northeast corner of sec. 18, T. 89 N., R. 13 W.; USGS Cedar Falls SE topographic quarter quadrangle; lat. 42 degrees 31 minutes 18.2 seconds N. and long. 92 degrees 24 minutes 52.8 seconds W., NAD 83:

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

E1—8 to 12 inches; dark grayish brown (10YR 4/2) and brown (10YR 4/3) silt loam; weak thin platy and weak fine granular structure; friable; common fine roots; common faint continuous dark brown (10YR 3/3) organic coatings on faces of peds; slightly acid; clear smooth boundary.

E2—12 to 16 inches; very dark grayish brown (10YR 4/3) silt loam; weak thick platy structure; friable; common fine and medium roots; few faint discontinuous dark brown (10YR 3/3) organic coatings on faces of peds; moderately acid; clear smooth boundary.

Bt1—16 to 23 inches; yellowish brown (10YR 5/4) silty clay loam; weak fine subangular blocky structure; friable; common fine and medium roots; few distinct discontinuous dark brown (10YR 4/3) clay films on faces of peds; moderately acid; clear smooth boundary.

Bt2—23 to 31 inches; yellowish brown (10YR 5/4) silty clay loam; weak fine and medium subangular blocky structure; friable; common fine roots; few distinct discontinuous dark brown (10YR 4/3) clay films on faces of peds; discontinuous stone line consisting of rounded gravel and cobbles 1 to 6 inches in diameter (5 to 10 percent of this horizon); moderately acid; gradual smooth boundary.

2Bt3—31 to 45 inches; strong brown (7.5YR 5/8) clay loam; moderate fine prismatic structure; firm; common fine roots; few prominent discontinuous light brownish gray (10YR 6/2) silt coatings on faces of peds; about 2 percent mixed gravel; common fine prominent grayish brown (10YR 5/2) redoximorphic depletions; moderately acid; gradual smooth boundary.

2BC—45 to 53 inches; strong brown (7.5YR 5/8) loam; moderate medium prismatic structure; firm; common fine roots; few prominent continuous very dark grayish brown (10YR 3/2) clay films in root channels and/or pores; about 2 percent mixed gravel; common fine prominent grayish brown (10YR 5/2) redoximorphic depletions; common fine prominent reddish brown (5YR 4/4) redoximorphic concentrations; strongly acid; gradual smooth boundary.

2C—53 to 80 inches; yellowish brown (10YR 5/6) loam; massive; firm; common fine very dark brown (10YR 2/2) masses of iron-manganese; common fine prominent grayish brown (10YR 5/2) redoximorphic depletions; about 2 percent mixed gravel; neutral.

Range in Characteristics

Depth to till: 20 to 40 inches
Depth to carbonates: More than 45 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silt loam

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

Bt horizon:
Hue—10YR
Value—4 or 5
Chroma—3 or 4
Texture—silty clay loam or silt loam; a stone line is commonly at the lower boundary of this horizon

2Bt horizon:
Hue—10YR or 7.5YR
Value—5

Chroma—4 to 8
Texture—loam, sandy clay loam, or clay loam

2BC or 2C horizon:
Hue—10YR or 7.5YR
Value—5
Chroma—4 to 8
Texture—loam, sandy clay loam, or clay loam

Waukee Series

Typical Pedon

Waukee loam, 0 to 2 percent slopes, in a cultivated field; 380 feet north and 2,300 feet west of the southeast corner of sec. 6, T. 89 N., R. 14 W.; USGS New Hartford SE topographic quadrangle; lat. 42 degrees 32 minutes 36 seconds N. and long. 92 degrees 32 minutes 36.5 seconds W., NAD 83:

Ap—0 to 8 inches; black (10YR 2/1) loam, very dark gray (10YR 3/1) dry; weak medium subangular blocky structure; friable; common very fine and fine roots; common very fine tubular pores; neutral; abrupt smooth boundary.

A—8 to 18 inches; very dark brown (10YR 2/2) loam, dark grayish brown (10YR 4/2) dry; weak fine and medium subangular blocky structure; friable; common very fine roots; common very fine tubular pores; neutral; clear smooth boundary.

Bw1—18 to 24 inches; brown (10YR 4/3) loam; weak fine and medium subangular blocky structure; friable; few very fine roots; common very fine tubular pores; common faint discontinuous dark brown (10YR 3/3) organic coatings on faces of peds; moderately acid; clear smooth boundary.

Bw2—24 to 33 inches; brown (10YR 4/3) loam; weak coarse subangular blocky structure; friable; few very fine roots; common very fine tubular pores; common faint discontinuous dark brown (10YR 3/3) organic coatings on faces of peds; moderately acid; clear smooth boundary.

2C1—33 to 48 inches; yellowish brown (10YR 5/4) loamy sand; single grain; loose; about 10 percent mixed gravel; moderately acid; gradual smooth boundary.

2C2—48 to 80 inches; yellowish brown (10YR 5/4) sand; single grain; loose; few fine distinct brown (7.5YR 4/4) redoximorphic concentrations; about 10 percent mixed gravel; slightly acid.

Range in Characteristics

Thickness of the mollic epipedon: 12 to 18 inches
Depth to sand and gravel: 30 to 40 inches

Ap and A horizons:
Hue—10YR
Value—2
Chroma—1 or 2
Texture—loam or silt loam

Bw horizon:
Hue—10YR or 7.5YR
Value—3 to 5
Chroma—3 to 6
Texture—loam or sandy clay loam

2BC or 2C horizon:
Hue—10YR or 7.5YR
Value—4 to 6
Chroma—3 to 8
Texture—loamy sand, sand, gravelly loamy sand, or gravelly sand

Wiota Series

Typical Pedon

Wiota silty clay loam, 0 to 2 percent slopes, in a cultivated field; Adams County, Iowa; 2,100 feet north and 200 feet west of the center of sec. 27, T. 73 N., R. 34 W.; USGS Corning North topographic quadrangle; lat. 41 degrees 06 minutes 05.5 seconds N. and long. 94 degrees 44 minutes 54.4 seconds W., NAD 83:

Ap—0 to 8 inches; black (10YR 2/1) silty clay loam, very dark gray (10YR 3/1) dry; weak very fine granular structure; friable; strongly acid; gradual smooth boundary.

A1—8 to 15 inches; very dark gray (10YR 3/1) silty clay loam, dark gray (10YR 4/1) dry; weak very fine granular structure; friable; moderately acid; gradual smooth boundary.

A2—15 to 22 inches; very dark gray (10YR 3/1) silty clay loam, dark gray (10YR 4/1) dry, very dark grayish brown (10YR 3/2) kneaded; moderate very fine subangular blocky structure; friable; moderately acid; gradual smooth boundary.

AB—22 to 28 inches; very dark grayish brown (10YR 3/2) and dark brown (10YR 3/3) silty clay loam, dark grayish brown (10YR 4/2) and brown (10YR 5/3) dry; faces of peds are very dark gray (10YR 3/1); moderate fine and very fine subangular blocky structure; friable; moderately acid; gradual smooth boundary.

Bt1—28 to 38 inches; brown (10YR 4/3) silty clay loam; weak fine subangular blocky structure; friable; few thin discontinuous clay films; some very dark gray wormcasts; some very dark gray

(10YR 3/1) coatings on a few peds; moderately acid; gradual smooth boundary.

Bt2—38 to 48 inches; brown (10YR 4/3) silty clay loam; weak medium subangular blocky structure; firm; few thin discontinuous clay films; few medium faint grayish brown (10YR 5/2) redoximorphic depletions; slightly acid; gradual smooth boundary.

C—48 to 64 inches; brown (10YR 4/3) silty clay loam; massive; some vertical cleavage; firm; many dark concretions; few fine faint grayish brown (10YR 5/2) redoximorphic depletions and few fine faint yellowish brown (10YR 5/4) redoximorphic concentrations; slightly acid.

Range in Characteristics

Thickness of the mollic epipedon: 18 to 32 inches
Depth to carbonates: More than 60 inches

Ap and A horizons:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silty clay loam or silt loam

Bt horizon:
Hue—10YR
Value—4 or 5
Chroma—3 or 4
Texture—silty clay loam

C horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—2 to 6
Texture—silty clay loam or silt loam

Formation of the Soils

This section describes the major factors of soil formation as they relate to the soils in Black Hawk County. These factors are climate; living organisms; topography, or relief; parent material; and time.

Climate

The soils in Black Hawk County formed under the influence of a midcontinental, subhumid climate for at least 5,000 years (Ruhe, 1956a). Between 5,000 and 16,000 years ago, the climate was conducive to the growth of forest vegetation. The morphology and properties of most of the soils indicate that the climate under which they formed was similar to the present one. The climate is fairly uniform throughout the county but is marked by wide seasonal extremes in temperature. Precipitation is distributed throughout the year.

Climate is a major factor in determining what soils form in the various kinds of parent material. It affects the rate and intensity of hydrolysis, carbonation, oxidation, and other important chemical reactions in the soil. Temperature, rainfall, relative humidity, and length of the frost-free period affect the kind of vegetation on the soil.

The influence of the general climate in a region is modified by local conditions in or near the developing soils. For example, soils on south-facing slopes formed under a microclimate that is warmer and drier than the average climate of nearby areas, and the poorly drained soils on bottom land formed under a wetter and cooler climate than most of the soils around them. These local differences influence the characteristics of the soil and account for some of the differences among soils in the same climatic region.

Living Organisms

Many changes in climate and vegetation have taken place in Iowa during the past 28,000 years. The vegetation 28,000 to 11,000 years ago was dominated by coniferous forest with a transitional period of birch and alder. Deciduous forest dominated the vegetation 11,000 to 9,000 years ago. A very dry period occurred between 9,000 and 3,200 years ago. Prairie vegetation was dominant during that period. Trees, especially oak, have invaded the prairie since about 3,200 years ago, but the prairie vegetation is still dominant.

For the past 3,200 years, the soils in the county have been influenced by two main kinds of vegetation—prairie grasses and trees. Big bluestem and little bluestem were the main prairie grasses. The trees, which were mainly deciduous, included oak, hickory, ash, elm, and maple.

Studies of the effects of vegetation on soils similar to those in the county indicate that vegetation shifted while soils developed in areas bordering both trees and grasses. The morphology of the Bassett, Dunkerton, Franklin, Hayfield, and Wapsie soils reflects the influence of trees and grasses. Chelsea soils reflect the influence of trees. Dinsdale, Kenyon, Readlyn, and Colo soils reflect the influence of grasses.

In most places, soils that formed under trees are lighter colored and more acid than soils that formed under grasses. Also, they have a thinner surface layer that is lower in organic matter content. The soils in the county that formed under a shifting vegetation or mixed grasses and trees have properties that are intermediate between the properties of soils that formed under grasses and those of soils that formed under trees.

Burrowing animals and earthworms help to keep the soil open and porous. Bacteria and fungi help to decompose vegetation, thus releasing nutrients for plants.

Topography

Topography can cause important differences among soils. It indirectly influences soil formation through its effect on drainage. The soils in the county range from level to moderately steep. In many areas of bottom land, the nearly level soils are frequently flooded and have a permanent or seasonal high water table. Water soaks into the nearly level soils that are not flooded. Much of the rainfall runs off the moderately steep soils on uplands. The level soils in the county are on broad upland flats and on stream terraces. The moderately steep soils are generally on slopes near the major streams and their tributaries. The intricate pattern of upland drainageways indicates that in most of the county the landscape has been modified by geologic processes.

Generally, the soils in Black Hawk County that formed in areas where the seasonal high water table was well below the subsoil have a yellowish brown subsoil. These include the Aredale, Dinsdale, and Dinsmore soils. Klinger, Klingmore, Marquis, Nevin, and Readlyn soils formed in areas where the seasonal high water table fluctuated and was periodically high.

Colo, Maxfield, Maxmore, Sawmill, and Tripoli soils formed under prairie grasses. They have a seasonal high water table and are poorly drained. They have a higher organic matter content in the surface layer than well drained soils that formed under prairie grasses.

Chelsea, Dinsdale, Kenyon, and Sparta soils, which have a wide range of slope, have some properties that change as slope increases. Two of these properties are the depth to carbonates and the thickness of the surface layer. These properties decrease as the slope increases.

Parent Material

The accumulation of parent material is the first step in the development of a soil. Most of the soils in the county formed in material that was transported from other locations and redeposited through the action of glacial ice, water, wind, or gravity. The main kinds of parent material in the county are drift, alluvium, sandy eolian material, and loess.

The landscape in the county has been studied in detail (Ruhe and others, 1968). It was previously thought of as the Iowan Surface; however, subsurface investigations and studies have shown that Iowan till does not exist but that an erosion-surface complex does exist in the Iowan till region. The Iowan erosional surface is multilevel. It is arranged in a series of steps from the major drainageways toward boundary divides. The highest areas on the Iowan erosional surface, although not found in the county, are small elliptical hills or elongated ridges called pahas. Below the pahas, the Iowan erosional surface cuts into the Kansan till and a stone line or a layer of sand separates the loess and the glacial till. The stone line occurs on all levels of the stepped surfaces. It also underlies upland drainageways.

Drift is all rock material transported and deposited by glacial ice, including till and the material sorted by meltwater. Till is unsorted sediment in which particles range in size from boulders to clay. The Nebraskan Glaciation, which was the first of the glacial advances in the survey area, occurred 750,000 years ago (Ruhe, 1956a and 1956b). It was followed by the Kansan Glaciation, which occurred about 500,000 years ago.

In the southwestern part of the county, loess, a silty material deposited by wind, overlies the till of the Kansan or Nebraskan Glaciation. The loess is 2 to 5 feet thick. The different kinds of till are not readily differentiated in the county. Geologic erosion has removed the loess on some of the side slopes. The till and paleosols of the glaciations and interglacial periods have been exposed on these side slopes. The paleosols developed in the till during the Yarmouth and Sangamon interglacial stages. This soil development occurred before the loess was deposited. The soils were strongly developed and had a gray clayey subsoil. Donnan soils formed in the gray paleosol. The gray paleosols remain in a few areas; however, in most areas geologic erosion has cut into and below the paleosols into the Kansan and Nebraskan till. In these places the till is only slightly weathered at the surface. It was exposed during the Wisconsin Stage of the Quaternary period (Ruhe, 1969).

The Dinsdale-Klinger-Maxfield association has some areas of exposed till. The till in this part of the county was truncated during the early part of the loess deposition in the Wisconsin age. The truncated till surface is known as the Iowan erosional surface (Ruhe, 1969). Several levels of summits occur in a gradual progression from the stream valleys towards the low crests that mark the drainage divides. Other features typical of the Iowan erosional surface are erratics and pahas. The erratics are large boulders that are partially buried or lying on the surface of the soil. The core of the paha is an erosional remnant of the Kansan till. The Yarmouth-Sangamon paleosol is intact in the areas of the pahas (Ruhe and others, 1968).

Alluvium is material deposited by water. Alluvial deposits of Late Wisconsin and Holocene age are on flood plains and terraces in Black Hawk County. About 20 percent of the soils in the county formed in alluvium. The major areas of these soils are along the Cedar River, the Wapsipinicon River, and Black Hawk Creek and their tributaries. The flood plains and alluvial terraces along these major drainageways can be quite large. The flood plain along the Cedar River south of Waterloo is 0.25 mile to 1.5 miles wide. If alluvial terraces are added with the flood plain, the valley is more than 3 miles wide.

Much of the alluvium in the county washed from soils in the uplands. Because the uplands in the northern three-quarters of the county are loamy, the alluvial sediments are loamy. Examples of loamy soils on flood plains are Coland and Spillville soils. The alluvium in which the frequently flooded Coland and Spillville soils formed was deposited very recently. As a result, these soils exhibit very little soil development. The occasionally flooded Coland and Spillville soils generally show some soil development in the subsoil.

The soils on terraces or second bottoms are above the existing flood plain and generally are not flooded. Most are underlain by coarser textured material within a depth of 2 to 5 feet. The coarser textured material is commonly coarse sand and gravel, but in some areas it is coarse sand. The silty alluvial soils on terraces occur in the southwestern one-quarter of the county and include Nevin, Sawmill, and Wiota soils.

Although the soils on flood plains and terraces formed in similar kinds of material, the texture of the soils differs. Nevin, Sawmill, and Wiota soils are silty and have less than 15 percent sand. Marshan, Lawler, Saude, and Waukee soils are loamy and contain more than 15 percent sand. Finchford and Flagler soils are sandy and are shallower to gravel than the other soils on flood plains and terraces.

Some of the alluvium has been transported only a short distance and has accumulated at the foot of the slope on which it originated. This material is called local alluvium. It retains many of the characteristics of the soils from which it has eroded. Ely and Floyd soils formed in local alluvium.

Sandy eolian material, which is deposited by wind, covers about 10 percent of the county. It is in the uplands and on stream terraces along the Cedar and Wapsipinicon Rivers. It has a much higher content of sand than the loess deposits and a lower content of clay. This material occurs on uplands as low mounds or dunes on ridgetops and side slopes, and it occurs on stream terraces as flats or gently rolling areas.

The sandy eolian material mainly consists of fine and very fine quartz that is highly resistant to weathering. It has been altered appreciably since it was deposited. Billett, Chelsea, Dickinson, and Sparta soils formed mainly in sandy eolian material.

Loess covers about 20 percent of the county. It ranges in depth from about 2 feet to 5 feet. It occurs in the southwestern part of the county and overlies till.

Dinsdale, Klinger, and Maxfield soils formed in 20 to 40 inches of loess, and Dinsmore, Klingmore, and Maxmore soils formed in 40 to 60 inches of loess (fig. 9). All of these soils are on the stable upland divides of the Kansan till plain.

Time

Time is required for a soil to develop. A young soil has weakly defined horizons or does not show evidence of horizon development. Most of the soils on

Figure 9.—An area of the Dinsmore-Klingmore-Maxmore association in southwestern Black Hawk County. These soils formed in 40 to 60 inches of loess overlying till.

the flood plains are young soils because the soil material continues to accumulate and has not been in place long enough for distinct horizons to develop.

The effects of time are evidenced by the increase of clay in the subsoil. A higher content of clay in the subsoil than in the surface layer is an indication that a high degree of soil profile development has taken place. This information can be important because soils that have a high content of clay in the subsoil generally have poorer drainage.

Soil material generally is removed from soils on steep slopes before the soils have time to develop a thick profile and strong horizons. Also, much of the water runs off the slopes rather than infiltrating into the soil material, so that even though the material has been in place for a long time, the soil may exhibit little development.

Most of the parent material in the survey area is thousands of years old. The present land surface and many of the soils are much younger because of recent geologic erosion (Ruhe, 1969). The oldest soils in the county formed on upland summits. They include the Dinsdale, Dinsmore, Kenyon, Readlyn, Klinger, Klingmore, Marquis, Maxfield, and Maxmore soils. They may be 14,000 years old (Ruhe, 1956a). Soils that formed in alluvium or in sandy eolian material are only a few thousand years old. Hayfield, Saude, Waukee, and Wiota soils formed on stream terraces, and Coland and Colo soils formed in alluvium on flood plains. Chelsea, Dickinson, and Sparta soils, which formed in sandy eolian material, are younger than the Hayfield, Saude, Waukee, and Wiota soils. Coland and Colo soils are younger than the Chelsea, Dickinson, and Sparta soils. The frequently flooded Spillville and Sigglekov soils formed in alluvium and are less than 150 years old.

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Glossary

Many of the terms relating to landforms, geology, and geomorphology are defined in more detail in the "National Soil Survey Handbook" (available in local offices of the Natural Resources Conservation Service or on the Internet).

Ablation till. Loose, relatively permeable earthy material deposited during the downwasting of nearly static glacial ice, either contained within or accumulated on the surface of the glacier.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Unconsolidated material, such as gravel, sand, silt, clay, and various mixtures of these, deposited on land by running water.

Alpha,alpha-dipyridyl. A compound that when dissolved in ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction implies reducing conditions and the likely presence of redoximorphic features.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Aspect. The direction toward which a slope faces. Also called slope aspect.

Association, soil. A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Backslope. The position that forms the steepest and generally linear, middle portion of a hillslope (fig. 10). In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.

Basal till. Compact till deposited beneath the ice.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Base slope (geomorphology). A geomorphic component of hills (fig. 10) 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 deposits. Material, such as sand and gravel, that is generally laid down parallel to an active or relict shoreline of a post-glacial or glacial lake.

Bedding plane. A planar or nearly planar bedding surface that visibly separates each successive layer of stratified sediment or rock (of the same or different lithology) from the preceding or following layer; a plane of deposition. It commonly marks a change in the circumstances of deposition and may show a parting, a color difference, a change in particle size, or various combinations of these. The term is commonly applied to any bedding surface, even one that is conspicuously bent or deformed by folding.

Bedrock. The solid rock that underlies the soil and

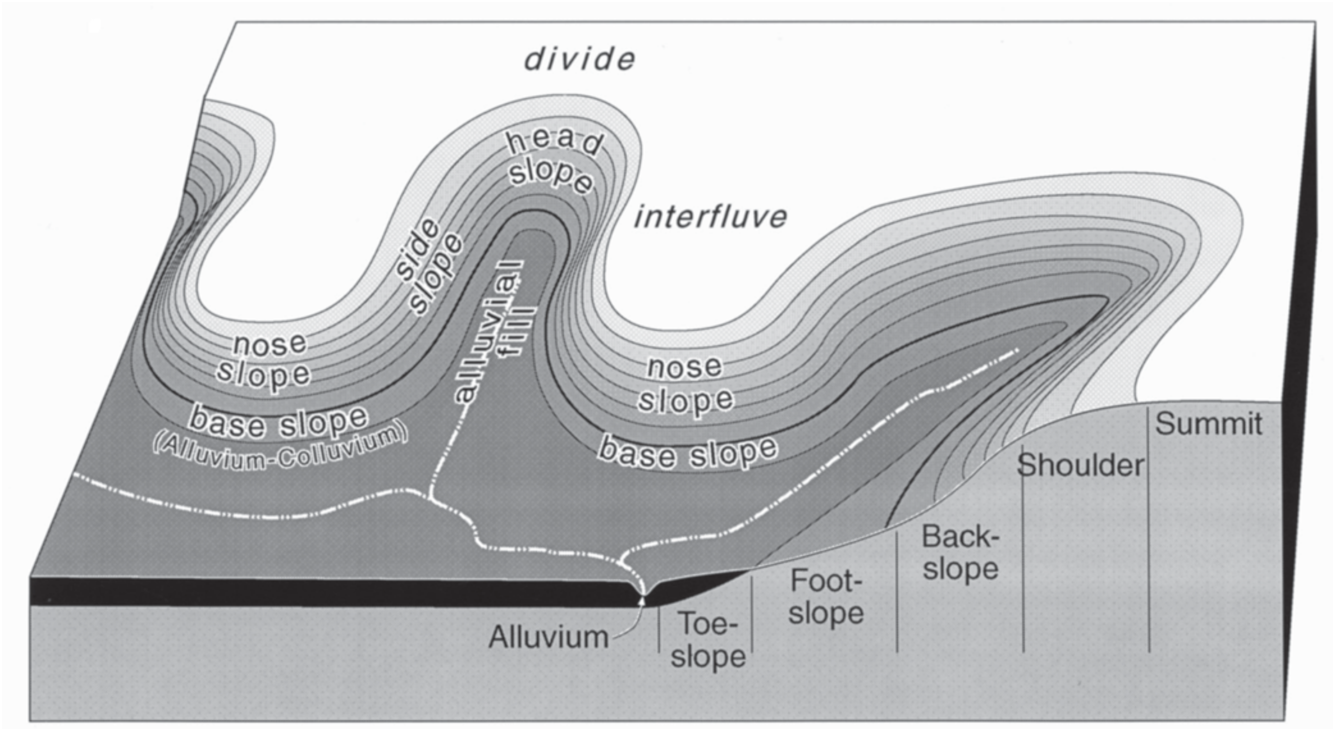

Figure 10.—Landscape relationship of geomorphic components and hillslope positions (modified after Ruhe and Walker, 1968).

other unconsolidated material or that is exposed at the surface.

Bedrock-controlled topography. A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.

Bench terrace. A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Blowout. A saucer-, cup-, or trough-shaped depression formed by wind erosion on a preexisting dune or other sand deposit, especially in an area of shifting sand or loose soil or where protective vegetation is disturbed or destroyed; the adjoining accumulation of sand derived from the depression, where recognizable, is commonly included. Blowouts are commonly small.

Bottom land. An informal term loosely applied to various portions of a flood plain.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

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.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Canopy. The leafy crown of trees or shrubs. (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 and under similar climatic conditions but that have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Catsteps. See Terracettes.

Channery soil material. Soil material that has, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Chemical treatment. Control of unwanted vegetation through the use of chemicals.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay depletions. See Redoximorphic features.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A dense, compact, slowly permeable subsoil layer that contains much more clay than the overlying materials, from which it is separated by a sharply defined boundary. A claypan is commonly hard when dry and plastic and sticky when wet.

Climax plant community. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material. Material that has 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

Colluvium. Unconsolidated, unsorted earth material being transported or deposited on side slopes and/or at the base of slopes by mass movement (e.g., direct gravitational action) and by local, unconcentrated runoff.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions. See Redoximorphic features.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Coprogenous earth (sedimentary peat). A type of limnic layer composed predominantly of fecal material derived from aquatic animals.

Corrosion (geomorphology). A process of erosion whereby rocks and soil are removed or worn away by natural chemical processes, especially by the solvent action of running water, but also by other reactions, such as hydrolysis, hydration, carbonation, and oxidation.

Corrosion (soil survey interpretations). Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cropping system. Growing crops according to a planned system of rotation and management practices.

Cross-slope farming. Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.

Crown. The upper part of a tree or shrub, including the living branches and their foliage.

Culmination of the mean annual increment (CMAI). The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Delta. A body of alluvium having a surface that is fan shaped and nearly flat; 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 layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Divide. (a) The line of separation, or (b) the summit area, or narrow tract of higher ground that constitutes the watershed boundary between two adjacent drainage basins (fig. 10); it divides the surface waters that flow naturally in one direction from those that flow in the opposite direction.

Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained*. These classes are defined in the "Soil Survey Manual."

Drainage, surface. Runoff, or surface flow of water, from an area.

Drift. A general term applied to all mineral material (clay, silt, sand, gravel, and boulders) transported by a glacier and deposited directly by or from the ice or transported by running water emanating from a glacier. Drift includes unstratified material (till) that forms moraines and stratified deposits that form outwash plains, eskers, kames, varves, and glaciofluvial sediments. The term is generally applied to Pleistocene glacial deposits in areas that no longer contain glaciers.

Drumlin. A low, smooth, elongated oval hill, mound, or ridge of compact till that has a core of bedrock or drift. It commonly has a blunt nose facing the direction from which the ice approached and a gentler slope tapering in the other direction. The longer axis is parallel to the general direction of glacier flow. Drumlins are products of streamline (laminar) flow of glaciers, which molded the subglacial floor through a combination of erosion and deposition.

Duff. A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

Earthy fill. See Mine spoil.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Eolian deposit. Sand-, silt-, or clay-sized clastic material transported and deposited primarily by wind, commonly in the form of a dune or a sheet of sand or loess.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Erosion pavement. A surficial lag concentration or layer of gravel and other rock fragments that remains on the soil surface after sheet or rill erosion or wind has removed the finer soil particles and that tends to protect the underlying soil from further erosion.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Most commonly applied to cliffs produced by differential erosion. Synonym: scarp.

Esker. A long, narrow, sinuous, steep-sided ridge of stratified sand and gravel deposited as the bed of a stream flowing in an ice tunnel within or below the ice (subglacial) or between ice walls on top of the ice of a wasting glacier and left behind as high ground when the ice melted. Eskers range in length from less than a kilometer to more than 160 kilometers and in height from 3 to 30 meters.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity*.

Fine textured soil. Sandy clay, silty clay, or clay.

First bottom. An obsolete, informal term loosely applied to the lowest flood-plain steps that are subject to regular flooding.

Flaggy soil material. Material that has, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

Flood plain. The nearly level plain that borders a stream and is subject to flooding unless protected artificially.

Flood-plain landforms. A variety of constructional and erosional features produced by stream channel migration and flooding. Examples include backswamps, flood-plain splays, meanders, meander belts, meander scrolls, oxbow lakes, and natural levees.

Flood-plain splay. A fan-shaped deposit or other outspread deposit formed where an overloaded stream breaks through a levee (natural or artificial) and deposits its material (commonly coarse grained) on the flood plain.

Flood-plain step. An essentially flat, terrace-like alluvial surface within a valley that is frequently covered by floodwater from the present stream; any approximately horizontal surface still actively modified by fluvial scour and/or deposition. May occur individually or as a series of steps.

Fluvial. Of or pertaining to rivers or streams; produced by stream or river action.

Footslope. The concave surface at the base of a hillslope (fig. 10). A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

Forb. Any herbaceous plant not a grass or a sedge.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Glaciofluvial deposits. Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur in the form of outwash plains, valley trains, deltas, kames, eskers, and kame terraces.

Glaciolacustrine deposits. Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are bedded or laminated.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Graded stripcropping. Growing crops in strips that grade toward a protected waterway.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water. Water filling all the unblocked pores of the material below the water table.

Gully. A small channel with steep sides caused by erosion and cut in unconsolidated materials by concentrated but intermittent flow of water. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hard to reclaim (in tables). Reclamation is difficult after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Head slope (geomorphology). A geomorphic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainageway (fig. 10). 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 generic term for an elevated area of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline. Slopes are generally more than 15 percent. The distinction between a hill and a mountain is arbitrary and may depend on local usage.

Hillslope. A generic term for the steeper part of a hill between its summit and the drainage line, valley flat, or depression floor at the base of a hill (fig. 10).

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the “Soil Survey Manual.” The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

L horizon.—A layer of organic and mineral limnic materials, including coprogenous earth (sedimentary peat), diatomaceous earth, and marl.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Ice-walled lake plain. A relict surface marking the floor of an extinct lake basin that was formed on solid ground and surrounded by stagnant ice in a stable or unstable superglacial environment on stagnation moraines. As the ice melted, the lake plain became perched above the adjacent landscape. The lake plain is well sorted, generally fine textured, stratified deposits.

Igneous rock. Rock that was formed by cooling and solidification of magma and that has not been changed appreciably by weathering since its formation. Major varieties include plutonic and volcanic rock (e.g., andesite, basalt, and granite).

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. A landform composed of the relatively undissected upland or ridge between two adjacent valleys containing streams flowing in the same general direction. An elevated area between two drainageways that sheds water to those drainageways.

Interfluve (geomorphology). A geomorphic component of hills consisting of the uppermost, comparatively level or gently sloping area of a hill (fig. 10); shoulders of backwearing hillslopes can narrow the upland or can merge, resulting in a strongly convex shape.

Intermittent stream. A stream, or reach of a stream, that does not flow year-round but that is commonly dry for 3 or more months out of 12 and whose channel is generally below the local water table. It flows only during wet periods or when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Iron depletions. See Redoximorphic features.

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. A low mound, knob, hummock, or short irregular ridge composed of stratified sand and gravel deposited by a subglacial stream as a fan or delta at the margin of a melting glacier; by a supraglacial stream in a low place or hole on the surface of the glacier; or as a ponded deposit on the surface or at the margin of stagnant ice.

Kame moraine. An end moraine that contains numerous kames. A group of kames along the front of a stagnant glacier, commonly comprising the slumped remnants of a formerly continuous outwash plain built up over the foot of rapidly wasting or stagnant ice.

Karst (topography). A kind of topography that formed in limestone, gypsum, or other soluble rocks by dissolution and that is characterized by closed depressions, sinkholes, caves, and underground drainage.

Knoll. A small, low, rounded hill rising above adjacent landforms.

K_{sat}. Saturated hydraulic conductivity. (See Permeability.)

Lacustrine deposit. Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Lake bed. The bottom of a lake; a lake basin.

Lake plain. A nearly level surface marking the floor of an extinct lake filled by well sorted, generally fine textured, stratified deposits, commonly containing varves.

Lake terrace. A narrow shelf, partly cut and partly built, produced along a lakeshore in front of a scarp line of low cliffs and later exposed when the water level falls.

Landslide. A general, encompassing term for most types of mass movement landforms and processes involving the downslope transport and outward deposition of soil and rock materials caused by gravitational forces; the movement may or may not involve saturated materials. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Linear extensibility. Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is used to determine the shrink-swell potential of soils. It is an expression of the volume change between the water content of the clod at $^{1}/_{3}$- or $^{1}/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Material transported and deposited by wind and consisting dominantly of silt-sized particles.

Low strength. The soil is not strong enough to support loads.

Low-residue crops. Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

Marl. An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal proportions; formed primarily under freshwater lacustrine conditions but also formed in more saline environments.

Masses. See Redoximorphic features.

Meander belt. The zone within which migration of a meandering channel occurs; the flood-plain area included between two imaginary lines drawn tangential to the outer bends of active channel loops.

Meander scar. A crescent-shaped, concave or linear mark on the face of a bluff or valley wall, produced by the lateral erosion of a meandering stream that impinged upon and undercut the bluff.

Meander scroll. One of a series of long, parallel, close-fitting, crescent-shaped ridges and troughs formed along the inner bank of a stream meander as the channel migrated laterally down-valley and toward the outer bank.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement at depth in the earth's crust. Nearly all such rocks are crystalline.

Mine spoil. An accumulation of displaced earthy material, rock, or other waste material removed during mining or excavation. Also called earthy fill.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. A kind of map unit that has little or no natural soil and supports little or no vegetation.

MLRA (major land resource area). A geographic area characterized by a particular pattern of land uses, elevation and topography, soils, climate, water resources, and potential natural vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Moraine. In terms of glacial geology, a mound, ridge, or other topographically distinct accumulation of unsorted, unstratified drift, predominantly till, deposited primarily by the direct action of glacial ice in a variety of landforms. Also, a general term for a landform composed mainly of till (except for kame moraines, which are composed mainly of stratified outwash) that has been deposited by a glacier. Some types of moraines are disintegration, end, ground, kame, lateral, recessional, and terminal.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Mudstone. A blocky or massive, fine grained sedimentary rock in which the proportions of clay and silt are approximately equal. Also, a general term for such material as clay, silt, claystone, siltstone, shale, and argillite and that should be used only when the amounts of clay and silt are not known or cannot be precisely identified.

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Natric horizon. A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules. See Redoximorphic features.

Nose slope (geomorphology). A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside (fig. 10). The overland waterflow is predominantly divergent. Nose slopes consist dominantly of colluvium and slope-wash sediments (for example, slope alluvium).

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Outwash. Stratified and sorted sediments (chiefly sand and gravel) removed or "washed out" from a glacier by meltwater streams and deposited in front of or beyond the end moraine or the margin of a glacier. The coarser material is deposited nearer to the ice.

Outwash plain. An extensive lowland area of coarse textured glaciofluvial material. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

Paleoterrace. An erosional remnant of a terrace that retains the surface form and alluvial deposits of its origin but was not emplaced by, and commonly does not grade to, a present-day stream or drainage network.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Parts per million (ppm). The concentration of a substance in the soil, such as phosphorus or potassium, in one million parts of air-dried soil on a weight per weight basis.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedisediment. A layer of sediment, eroded from the shoulder and backslope of an erosional slope, that lies on and is being (or was) transported across a gently sloping erosional surface at the foot of a receding hill or mountain slope.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The movement of water through the soil.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Impermeable	less than 0.0015 inch
Very slow	0.0015 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

Phosphorus. The amount of phosphorus available to plants at a depth of 30 to 42 inches is expressed in parts per million and based on the weighted average of air-dried soil samples. Terms describing the amount of available phosphorus are:

Very low	less than 7.5 ppm
Low	7.5 to 13.0 ppm
Medium	13.0 to 22.5 ppm
High	more than 22.5 ppm

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Pitted outwash plain. An outwash plain marked by many irregular depressions, such as kettles, shallow pits, and potholes, which formed by melting of incorporated ice masses.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plateau (geomorphology). A comparatively flat area of great extent and elevation; specifically, an extensive land region that is considerably elevated (more than 100 meters) above the adjacent lower lying terrain, is commonly limited on at least one side by an abrupt descent, and has a flat or nearly level surface. A comparatively large part of a plateau surface is near summit level.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Pore linings. See Redoximorphic features.

Potassium. The amount of potassium available to plants at a depth of 12 to 24 inches is expressed in parts per million and based on the weighted average of air-dried soil samples. Terms describing the amount of available potassium are:

Very low	less than 50 ppm
Low	50 to 79 ppm
Medium	79 to 125 ppm
High	more than 125 ppm

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.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed as pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Redoximorphic concentrations. See Redoximorphic features.

Redoximorphic depletions. See Redoximorphic features.

Redoximorphic features. Redoximorphic features are associated with wetness and result from alternating periods of reduction and oxidation of iron and manganese compounds in the soil. Reduction occurs during saturation with water, and oxidation occurs when the soil is not saturated. Characteristic color patterns are created by these processes. The reduced iron and manganese ions may be removed from a soil if vertical or lateral fluxes of water occur, in which case there is no iron or manganese precipitation in that soil. Wherever the iron and manganese are oxidized and precipitated, they form either soft masses or hard concretions or nodules. Movement of iron and manganese as a result of redoximorphic processes in a soil may result in redoximorphic features that are defined as follows:

1. Redoximorphic concentrations.—These are zones of apparent accumulation of iron-manganese oxides, including:

   A. Nodules and concretions, which are cemented bodies that can be removed from the soil intact. Concretions are distinguished from nodules on the basis of internal organization. A concretion typically has concentric layers that are visible to the naked eye. Nodules do not have visible organized internal structure; *and*

   B. Masses, which are noncemented concentrations of substances within the soil matrix; *and*

   C. Pore linings, i.e., zones of accumulation along pores that may be either coatings on pore surfaces or impregnations from the matrix adjacent to the pores.

2. Redoximorphic depletions.—These are zones of low chroma (chromas less than those in the matrix) where either iron-manganese oxides alone or both iron-manganese oxides and clay have been stripped out, including:

A. Iron depletions, i.e., zones that contain low amounts of iron and manganese oxides but have a clay content similar to that of the adjacent matrix; *and*

B. Clay depletions, i.e., zones that contain low amounts of iron, manganese, and clay (often referred to as silt coatings or skeletans).

3. Reduced matrix.—This is a soil matrix that has low chroma *in situ* but undergoes a change in hue or chroma within 30 minutes after the soil material has been exposed to air.

Reduced matrix. See Redoximorphic features.

Regolith. All unconsolidated earth materials above the solid bedrock. It includes material weathered in place from all kinds of bedrock and alluvial, glacial, eolian, lacustrine, and pyroclastic deposits.

Relief. The relative difference in elevation between the upland summits and the lowlands or valleys of a given region.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as bedrock disintegrated in place.

Rill. A very small, steep-sided channel resulting from erosion and cut in unconsolidated materials by concentrated but intermittent flow of water. A rill generally is not an obstacle to wheeled vehicles and is shallow enough to be smoothed over by ordinary tillage.

Riser. The vertical or steep side slope (e.g., escarpment) of terraces, flood-plain steps, or other stepped landforms; commonly a recurring part of a series of natural, steplike landforms, such as successive stream terraces.

Road cut. A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Saline soil. A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saturated hydraulic conductivity (K_{sat}). See Permeability.

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Scarification. The act of abrading, scratching, loosening, crushing, or modifying the surface to increase water absorption or to provide a more tillable soil.

Second bottom. The first terrace above the normal flood plain (or first bottom) of a river.

Sedimentary rock. A consolidated deposit of clastic particles, chemical precipitates, or organic remains accumulated at or near the surface of the earth under normal low temperature and pressure conditions. Sedimentary rocks include consolidated equivalents of alluvium, colluvium, drift, and eolian, lacustrine, and marine deposits. Examples are sandstone, siltstone, mudstone, claystone, shale, conglomerate, limestone, dolomite, and coal.

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 that formed by the hardening of a deposit of clay, silty clay, or silty clay loam and that has a tendency to split into thin layers.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shoulder. The convex, erosional surface near the top of a hillslope (fig. 10). A shoulder is a transition from summit to backslope.

Shrink-swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Side slope (geomorphology). A geomorphic component of hills consisting of a laterally planar area of a hillside (fig. 10). The overland waterflow is predominantly parallel. Side slopes are dominantly colluvium and slope-wash sediments.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. An indurated silt having the texture and composition of shale but lacking its fine lamination or fissility; a massive mudstone in which silt predominates over clay.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Sinkhole. A closed, circular or elliptical depression, commonly funnel shaped, characterized by subsurface drainage and formed either by dissolution of the surface of underlying bedrock (e.g., limestone, gypsum, or salt) or by collapse of underlying caves within bedrock. Complexes of sinkholes in carbonate-rock terrain are the main components of karst topography.

Slickensides (pedogenic). Grooved, striated, and/or glossy (shiny) slip faces on structural peds, such as wedges; produced by shrink-swell processes, most commonly in soils that have a high content of expansive clays.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slope alluvium. Sediment gradually transported down the slopes of mountains or hills primarily by nonchannel alluvial processes (i.e., slope-wash processes) and characterized by particle sorting. Lateral particle sorting is evident on long slopes. In a profile sequence, sediments may be distinguished by differences in size and/or specific gravity of rock fragments and may be separated by stone lines. Burnished peds and sorting of rounded or subrounded pebbles or cobbles distinguish these materials from unsorted colluvial deposits.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Sodium adsorption ratio (SAR). A measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration.

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief and by the passage of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Stagnation moraine. A body of drift released by the melting of a glacier that ceased flowing. Commonly but not always occurs near ice margins; composed of till, ice-contact stratified drift, and small areas of glacial lake sediment. Typical landforms are knob-and-kettle topography, locally including ice-walled lake plains.

Stone line. In a vertical cross section, a line formed by scattered fragments or a discrete layer of angular and subangular rock fragments (commonly a gravel- or cobble-sized lag concentration) that formerly was draped across a topographic surface and was later buried by additional sediments. A stone line generally caps material that was subject to weathering, soil formation, and erosion before burial. Many stone lines seem to be buried erosion pavements, originally formed by sheet and rill erosion across the land surface.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Strath terrace. A type of stream terrace; formed as an erosional surface cut on bedrock and thinly mantled with stream deposits (alluvium).

Stream terrace. One of a series of platforms in a stream valley, flanking and more or less parallel to the stream channel, originally formed near the level of the stream; represents the remnants of an abandoned flood plain, stream bed, or valley floor produced during a former state of fluvial erosion or deposition.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summit. The topographically highest position of a hillslope (fig. 10). 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.

Swale. A slight depression in the midst of generally level land. A shallow depression in an undulating ground moraine caused by uneven glacial deposition.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

Terminal moraine. An end moraine that marks the farthest advance of a glacier. It typically has the form of a massive arcuate or concentric ridge, or complex of ridges, and is underlain by till and other types of drift.

Terrace (conservation). An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geomorphology). A steplike surface, bordering a valley floor or shoreline, that represents the former position of a flood plain, lake, or seashore. The term is usually applied both to the relatively flat summit surface (tread) that was cut or built by stream or wave action and to the steeper descending slope (scarp or riser) that has graded to a lower base level of erosion.

Terracettes. Small, irregular steplike forms on steep hillslopes, especially in pasture, formed by creep or erosion of surficial materials that may be induced or enhanced by trampling of livestock, such as sheep or cattle.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Till. Dominantly unsorted and nonstratified drift, generally unconsolidated and deposited directly by a glacier without subsequent reworking by meltwater, and consisting of a heterogeneous mixture of clay, silt, sand, gravel, stones, and boulders; rock fragments of various lithologies are embedded within a finer matrix that can range from clay to sandy loam.

Till plain. An extensive area of level to gently undulating soils underlain predominantly by till and bounded at the distal end by subordinate recessional or end moraines.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope. The gently inclined surface at the base of a hillslope (fig. 10). Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Tread. The flat to gently sloping, topmost, laterally extensive slope of terraces, flood-plain steps, or other stepped landforms; commonly a recurring part of a series of natural steplike landforms, such as successive stream terraces.

Upland. An informal, general term for the higher ground of a region, in contrast with a low-lying adjacent area, such as a valley or plain, or for land at a higher elevation than the flood plain or low stream terrace; land above the footslope zone of the hillslope continuum.

Valley fill. The unconsolidated sediment deposited by any agent (water, wind, ice, or mass wasting) so as to fill or partly fill a valley.

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.

Weathering. All physical disintegration, chemical decomposition, and biologically induced changes in rocks or other deposits at or near the earth's surface by atmospheric or biologic agents or by circulating surface waters but involving essentially no transport of the altered material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Tables

Table 1.--Temperature and Precipitation

(Recorded in the period 1961-90 at Waterloo, Iowa)

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January----	23.7	5.4	14.6	50	-25	0	0.80	0.35	1.18	2	6.3
February---	29.4	10.7	20.0	56	-22	0	1.08	.33	1.69	2	6.9
March------	42.6	24.1	33.4	78	-6	13	2.30	1.19	3.27	5	5.7
April------	58.7	36.2	47.5	87	14	84	3.30	1.95	4.51	6	1.7
May--------	71.0	47.8	59.4	91	29	310	4.08	2.38	5.60	7	.0
June-------	80.5	57.6	69.0	96	41	572	4.47	2.94	5.87	6	.0
July-------	83.9	62.2	73.0	98	47	714	4.83	2.64	6.76	6	.0
August-----	81.5	59.0	70.3	97	42	628	3.64	1.53	5.43	5	.0
September--	73.2	50.0	61.6	93	29	358	3.51	1.46	5.24	5	.0
October----	61.4	38.4	49.9	86	17	118	2.57	1.08	3.83	5	.1
November---	44.8	26.2	35.5	70	0	12	1.82	.64	2.80	3	3.2
December---	29.1	12.0	20.6	58	-19	1	1.33	.67	1.91	3	7.9
Yearly:											
Average---	56.7	35.8	46.2	---	---	---	---	---	---	---	---
Extreme---	105	-34	---	100	-27	---	---	---	---	---	---
Total-----	---	---	---	---	---	2,809	33.72	27.38	39.67	55	31.8

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 degrees F).

Table 2.--Freeze Dates in Spring and Fall

(Recorded in the period 1961-90 at Waterloo, Iowa)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	Apr. 20	May 2	May 18
2 years in 10 later than--	Apr. 16	Apr. 27	May 13
5 years in 10 later than--	Apr. 8	Apr. 18	May 3
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 6	Sept. 27	Sept. 17
2 years in 10 earlier than--	Oct. 11	Oct. 2	Sept. 22
5 years in 10 earlier than--	Oct. 21	Oct. 11	Sept. 30

Table 3.--Growing Season

(Recorded in the period 1961-90 at Waterloo, Iowa)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	177	154	133
8 years in 10	183	161	138
5 years in 10	195	175	149
2 years in 10	207	189	160
1 year in 10	213	196	165

Table 4.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
7	Wiota silty clay loam, 0 to 2 percent slopes	3,088	0.8
41	Sparta loamy fine sand, 0 to 2 percent slopes	2,609	0.7
41B	Sparta loamy fine sand, 2 to 5 percent slopes	8,097	2.2
41C	Sparta loamy fine sand, 5 to 9 percent slopes	1,853	0.5
41D	Sparta loamy fine sand, 9 to 14 percent slopes	401	0.1
63B	Chelsea loamy fine sand, 2 to 5 percent slopes	1,463	0.4
63C	Chelsea loamy fine sand, 5 to 9 percent slopes	541	0.1
63D	Chelsea loamy fine sand, 9 to 14 percent slopes	212	*
83B	Kenyon loam, 2 to 5 percent slopes	29,389	8.0
83C	Kenyon loam, 5 to 9 percent slopes	2,859	0.8
83C2	Kenyon loam, 5 to 9 percent slopes, moderately eroded	3,804	1.0
83D2	Kenyon loam, 9 to 14 percent slopes, moderately eroded	165	*
84	Clyde silty clay loam, 0 to 3 percent slopes	11,639	3.2
88	Nevin silty clay loam, 0 to 2 percent slopes	3,989	1.1
133	Colo silty clay loam, 0 to 2 percent slopes, occasionally flooded	3,961	1.1
135	Coland clay loam, 0 to 2 percent slopes, occasionally flooded	1,398	0.4
159	Finchford loamy sand, 0 to 2 percent slopes	3,854	1.1
159C	Finchford loamy sand, 2 to 9 percent slopes	576	0.2
171B	Bassett loam, 2 to 5 percent slopes	915	0.2
175	Dickinson fine sandy loam, 0 to 2 percent slopes	1,080	0.3
175B	Dickinson fine sandy loam, 2 to 5 percent slopes	2,007	0.5
177	Saude loam, 0 to 2 percent slopes	6,580	1.8
177B	Saude loam, 2 to 5 percent slopes	1,594	0.4
178	Waukee loam, 0 to 2 percent slopes	4,712	1.3
178B	Waukee loam, 2 to 5 percent slopes	1,489	0.4
184	Klinger silty clay loam, 1 to 3 percent slopes	11,109	3.0
198B	Floyd loam, 1 to 4 percent slopes	3,786	1.0
213B	Rockton loam, 30 to 40 inches to limestone, 2 to 5 percent slopes	567	0.2
221	Klossner muck, 1 to 3 percent slopes	204	*
284	Flagler sandy loam, 0 to 2 percent slopes	5,103	1.4
284B	Flagler sandy loam, 2 to 5 percent slopes	1,143	0.3
290	Dells silt loam, 0 to 2 percent slopes	860	0.2
354	Aquolls, ponded, 0 to 1 percent slopes	339	*
377B	Dinsdale silty clay loam, 2 to 5 percent slopes	17,701	4.8
377C	Dinsdale silty clay loam, 5 to 9 percent slopes	1,068	0.3
377C2	Dinsdale silty clay loam, 5 to 9 percent slopes, moderately eroded	585	0.2
382	Maxfield silty clay loam, 0 to 2 percent slopes	8,508	2.3
391B	Clyde-Floyd complex, 1 to 4 percent slopes	32,180	8.8
395B	Marquis loam, 2 to 5 percent slopes	24,176	6.6
398	Tripoli clay loam, 0 to 2 percent slopes	8,923	2.4
399	Readlyn loam, 1 to 3 percent slopes	18,082	4.9
408B	Olin fine sandy loam, 2 to 5 percent slopes	3,263	0.9
408C	Olin fine sandy loam, 5 to 9 percent slopes	422	0.1
412C	Emeline loam, 2 to 9 percent slopes	217	*
426B	Aredale loam, 2 to 5 percent slopes	4,484	1.2
426C	Aredale loam, 5 to 9 percent slopes	1,802	0.5
426C2	Aredale loam, 5 to 9 percent slopes, moderately eroded	1,559	0.4
468B	Dunkerton sandy loam, 2 to 5 percent slopes	2,208	0.6
468C	Dunkerton sandy loam, 5 to 9 percent slopes	187	*
471	Oran loam, 1 to 3 percent slopes	1,212	0.3
485	Spillville loam, 0 to 2 percent slopes, occasionally flooded	2,113	0.6
585	Spillville-Coland complex, 0 to 2 percent slopes, occasionally flooded	4,664	1.3
626	Hayfield loam, 24 to 40 inches to sand and gravel, 0 to 2 percent slopes	2,668	0.7
761	Franklin silt loam, 1 to 3 percent slopes	876	0.2
771B	Waubeek silt loam, 2 to 5 percent slopes	498	0.1
775B	Billett sandy loam, 2 to 5 percent slopes	711	0.2
776C	Lilah sandy loam, 2 to 9 percent slopes	414	0.1
777	Wapsie loam, 1 to 3 percent slopes	933	0.3
781B	Lourdes loam, 2 to 5 percent slopes	474	0.1
781C2	Lourdes loam, 5 to 9 percent slopes, moderately eroded	212	*
782B	Donnan loam, 2 to 5 percent slopes	1,121	0.3
798	Protivin loam, 1 to 3 percent slopes	790	0.2

See footnote at end of table.

Table 4.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
809B	Bertram fine sandy loam, 2 to 5 percent slopes	396	0.1
877B	Dinsmore silty clay loam, 2 to 5 percent slopes	6,086	1.7
884	Klingmore silty clay loam, 1 to 3 percent slopes	3,295	0.9
911B	Colo-Ely complex, 2 to 5 percent slopes	5,884	1.6
933	Sawmill silty clay loam, 0 to 2 percent slopes, occasionally flooded	8,955	2.4
982	Maxmore silty clay loam, 0 to 2 percent slopes	2,958	0.8
1152	Marshan clay loam, 24 to 40 inches to sand and gravel, 0 to 2 percent slopes	9,403	2.6
1226	Lawler loam, 24 to 40 inches to sand and gravel, 0 to 2 percent slopes	4,402	1.2
1285G	Burkhardt-Bassett-Chelsea complex, 18 to 60 percent slopes	349	*
1585	Spillville-Coland, channeled-Aquolls, ponded, complex, 0 to 2 percent slopes, frequently flooded	19,351	5.3
1586	Sigglekov-Fluvaquents, channeled-Aquents, ponded, complex, 0 to 2 percent slopes, frequently flooded	2,297	0.6
4000	Urban land	547	0.1
4007	Wiota-Urban land complex, 0 to 2 percent slopes	1,156	0.3
4041	Sparta-Urban land complex, 0 to 2 percent slopes	679	0.2
4041B	Sparta-Urban land complex, 2 to 5 percent slopes	1,535	0.4
4041C	Sparta-Urban land complex, 5 to 9 percent slopes	886	0.2
4041D	Sparta-Urban land complex, 9 to 14 percent slopes	27	*
4063B	Chelsea-Urban land complex, 2 to 5 percent slopes	6	*
4063C	Chelsea-Urban land complex, 5 to 9 percent slopes	76	*
4063D	Chelsea-Urban land complex, 9 to 14 percent slopes	39	*
4083B	Kenyon-Urban land complex, 2 to 5 percent slopes	4,028	1.1
4083C	Kenyon-Urban land complex, 5 to 9 percent slopes	2,624	0.7
4083D	Kenyon-Urban land complex, 9 to 14 percent slopes	29	*
4084	Clyde-Urban land complex, 0 to 3 percent slopes	23	*
4088	Nevin-Urban land complex, 0 to 2 percent slopes	307	*
4133	Colo, occasionally flooded-Urban land complex, 0 to 2 percent slopes	253	*
4135	Coland, occasionally flooded-Urban land complex, 0 to 2 percent slopes	22	*
4152	Marshan-Urban land complex, 0 to 2 percent slopes	552	0.2
4159	Finchford-Urban land complex, 0 to 2 percent slopes	6,075	1.7
4159C	Finchford-Urban land complex, 2 to 9 percent slopes	142	*
4171B	Bassett-Urban land complex, 2 to 5 percent slopes	171	*
4171D	Bassett-Urban land complex, 5 to 14 percent slopes	418	0.1
4175	Dickinson-Urban land complex, 0 to 2 percent slopes	76	*
4175B	Dickinson-Urban land complex, 2 to 5 percent slopes	143	*
4177	Saude-Urban land complex, 0 to 2 percent slopes	1,679	0.5
4177B	Saude-Urban land complex, 2 to 5 percent slopes	123	*
4178	Waukee-Urban land complex, 0 to 2 percent slopes	303	*
4184	Klinger-Urban land complex, 1 to 3 percent slopes	421	0.1
4198B	Floyd-Urban land complex, 1 to 4 percent slopes	41	*
4226	Lawler-Urban land complex, 0 to 2 percent slopes	342	*
4284	Flagler-Urban land complex, 0 to 2 percent slopes	895	0.2
4284B	Flagler-Urban land complex, 2 to 5 percent slopes	161	*
4377B	Dinsdale-Urban land complex, 2 to 5 percent slopes	643	0.2
4377C	Dinsdale-Urban land complex, 5 to 9 percent slopes	23	*
4382	Maxfield-Urban land complex, 0 to 2 percent slopes	333	*
4391B	Clyde-Floyd-Urban land complex, 1 to 4 percent slopes	2,452	0.7
4398	Tripoli-Urban land complex, 0 to 2 percent slopes	26	*
4399	Readlyn-Urban land complex, 1 to 3 percent slopes	77	*
4408B	Olin-Urban land complex, 2 to 5 percent slopes	211	*
4408C	Olin-Urban land complex, 5 to 9 percent slopes	111	*
4426B	Aredale-Urban land complex, 2 to 5 percent slopes	77	*
4426C	Aredale-Urban land complex, 5 to 9 percent slopes	402	0.1
4585	Spillville, occasionally flooded-Coland, occasionally flooded-Urban land complex, 0 to 2 percent slopes	388	0.1
4761	Franklin-Urban land complex, 1 to 3 percent slopes	8	*
4771B	Waubeek-Urban land complex, 2 to 5 percent slopes	152	*
4771D	Waubeek-Urban land complex, 5 to 14 percent slopes	85	*

See footnote at end of table.

Table 4.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
4798	Protivin-Urban land complex, 1 to 3 percent slopes	6	*
4911B	Colo-Ely-Urban land complex, 2 to 5 percent slopes	483	0.1
4933	Sawmill, occasionally flooded-Urban land complex, 0 to 2 percent slopes	104	*
4946	Orthents-Urban land complex	2,800	0.8
5010	Pits, sand and gravel	852	0.2
5030	Pits, limestone quarries	305	*
5040	Orthents, loamy	1,122	0.3
5053	Psammaquents, frequently flooded	342	*
5080	Orthents, sanitary landfill	149	*
AW	Animal waste	5	*
SL	Sewage lagoon	24	*
W	Water	4,828	1.3
	Total	366,600	100.0

* Less than 0.1 percent.

Table 5.--Cropland Management Considerations

(See text for a description of the considerations listed in this table)

Map symbol and soil name	Cropland management considerations
7:	
Wiota	Excessive permeability Potential for ground-water contamination
41:	
Sparta	Acid soil Excessive permeability Limited available water capacity Limited content of organic matter Potential for ground-water contamination Wind erosion
41B:	
Sparta	Acid soil Excessive permeability Limited available water capacity Limited content of organic matter Potential for ground-water contamination Wind erosion
41C:	
Sparta	Acid soil Excessive permeability Limited available water capacity Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Wind erosion
41D:	
Sparta	Acid soil Excessive permeability Limited available water capacity Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
63B:	
Chelsea	Excessive permeability Limited available water capacity Limited content of organic matter Potential for ground-water contamination Wind erosion
63C:	
Chelsea	Excessive permeability Limited available water capacity Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Wind erosion
63D:	
Chelsea	Excessive permeability Limited available water capacity Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion

Table 5.--Cropland Management Considerations--Continued

Map symbol and soil name	Cropland management considerations
83B:	
Kenyon	Potential for ground-water contamination Potential for surface-water contamination Water erosion
83C:	
Kenyon	Potential for ground-water contamination Potential for surface-water contamination Water erosion
83C2:	
Kenyon, moderately eroded	Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion
83D2:	
Kenyon, moderately eroded	Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion
84:	
Clyde	Potential for ground-water contamination Seasonal high water table
88:	
Nevin	Acid soil Potential for ground-water contamination Seasonal high water table
133:	
Colo, occasionally flooded	Flooding Potential for ground-water contamination Potential for surface-water contamination Seasonal high water table
135:	
Coland, occasionally flooded	Flooding Potential poor tilth and compaction Potential for ground-water contamination Potential for surface-water contamination Seasonal high water table
159:	
Finchford	Acid soil Excessive permeability Limited available water capacity Limited content of organic matter Potential for ground-water contamination Wind erosion
159C:	
Finchford	Acid soil Excessive permeability Limited available water capacity Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Wind erosion

Table 5.--Cropland Management Considerations--Continued

Map symbol and soil name	Cropland management considerations
171B:	
Bassett	Potential for ground-water contamination Potential for surface-water contamination Water erosion Seasonal high water table
175:	
Dickinson	Excessive permeability Limited available water capacity Potential for ground-water contamination Wind erosion
175B:	
Dickinson	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
177:	
Saude	Acid soil Excessive permeability Potential for ground-water contamination
177B:	
Saude	Acid soil Excessive permeability Potential for ground-water contamination Potential for surface-water contamination Water erosion
178:	
Waukee	Acid soil Excessive permeability Potential for ground-water contamination
178B:	
Waukee	Acid soil Excessive permeability Potential for ground-water contamination Potential for surface-water contamination Water erosion
184:	
Klinger	Potential for ground-water contamination Seasonal high water table
198B:	
Floyd	Potential for ground-water contamination Potential for surface-water contamination Water erosion Seasonal high water table
213B:	
Rockton, 30 to 40 inches to limestone	Depth to rock Potential for ground-water contamination Potential for surface-water contamination Restricted permeability Water erosion

Table 5.--Cropland Management Considerations--Continued

Map symbol and soil name	Cropland management considerations
221:	
Klossner	High content of organic matter Potential for ground-water contamination Seasonal high water table Wind erosion
284:	
Flagler	Excessive permeability Limited available water capacity Potential for ground-water contamination Wind erosion
284B:	
Flagler	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
290:	
Dells	Excessive permeability Potential for ground-water contamination Seasonal high water table
354:	
Aquolls, ponded	Ponding Potential for ground-water contamination Potential for surface-water contamination Seasonal high water table
377B:	
Dinsdale	Potential for ground-water contamination Potential for surface-water contamination Water erosion
377C:	
Dinsdale	Potential for ground-water contamination Potential for surface-water contamination Water erosion
377C2:	
Dinsdale, moderately eroded	Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion
382:	
Maxfield	Potential poor tilth and compaction Potential for ground-water contamination Seasonal high water table
391B:	
Clyde	Potential for ground-water contamination Seasonal high water table
Floyd	Potential for ground-water contamination Potential for surface-water contamination Water erosion Seasonal high water table

Table 5.--Cropland Management Considerations--Continued

Map symbol and soil name	Cropland management considerations
395B:	
Marquis	Potential for ground-water contamination Potential for surface-water contamination Water erosion Seasonal high water table
398:	
Tripoli	Potential poor tilth and compaction Potential for ground-water contamination Seasonal high water table
399:	
Readlyn	Potential for ground-water contamination Seasonal high water table
408B:	
Olin	Acid soil Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
408C:	
Olin	Acid soil Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
412C:	
Emeline	Depth to rock Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Restricted permeability Water erosion
426B:	
Aredale	Acid soil Potential for ground-water contamination Potential for surface-water contamination Water erosion
426C:	
Aredale	Acid soil Potential for ground-water contamination Potential for surface-water contamination Water erosion
426C2:	
Aredale, moderately eroded	Acid soil Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion
468B:	
Dunkerton	Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Water erosion Seasonal high water table Wind erosion

Table 5.--Cropland Management Considerations--Continued

Map symbol and soil name	Cropland management considerations
468C:	
Dunkerton	Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Water erosion Seasonal high water table Wind erosion
471:	
Oran	Potential for ground-water contamination Seasonal high water table
485:	
Spillville, occasionally flooded	Flooding Potential for ground-water contamination Potential for surface-water contamination Seasonal high water table
585:	
Spillville, occasionally flooded	Flooding Potential for ground-water contamination Potential for surface-water contamination Seasonal high water table
Coland, occasionally flooded	Flooding Potential poor tilth and compaction Potential for ground-water contamination Potential for surface-water contamination Seasonal high water table
626:	
Hayfield, 24 to 40 inches to sand and gravel	Acid soil Excessive permeability Potential for ground-water contamination Seasonal high water table
761:	
Franklin	Acid soil Potential for ground-water contamination Seasonal high water table
771B:	
Waubeek	Acid soil Potential for ground-water contamination Potential for surface-water contamination Water erosion
775B:	
Billett	Excessive permeability Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion

Table 5.--Cropland Management Considerations--Continued

Map symbol and soil name	Cropland management considerations
776C:	
Lilah	Acid soil Excessive permeability Limited available water capacity Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
777:	
Wapsie	Acid soil Excessive permeability Potential for ground-water contamination
781B:	
Lourdes	Acid soil Potential for ground-water contamination Potential for surface-water contamination Water erosion
781C2:	
Lourdes, moderately eroded	Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion
782B:	
Donnan	Acid soil Potential for ground-water contamination Potential for surface-water contamination Restricted permeability Water erosion Seasonal high water table
798:	
Protivin	Acid soil Potential for ground-water contamination Potential for surface-water contamination Seasonal high water table
809B:	
Bertram	Acid soil Depth to rock Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Restricted permeability Water erosion Wind erosion
877B:	
Dinsmore	Acid soil Potential for ground-water contamination Potential for surface-water contamination Water erosion
884:	
Klingmore	Potential for ground-water contamination Seasonal high water table

Table 5.--Cropland Management Considerations--Continued

Map symbol and soil name	Cropland management considerations
911B:	
Colo	Potential for ground-water contamination Seasonal high water table
Ely	Potential for ground-water contamination Potential for surface-water contamination Water erosion Seasonal high water table
933:	
Sawmill, occasionally flooded	Flooding Potential poor tilth and compaction Potential for ground-water contamination Potential for surface-water contamination Seasonal high water table
982:	
Maxmore	Potential for ground-water contamination Seasonal high water table
1152:	
Marshan, 24 to 40 inches to sand and gravel	Excessive permeability Potential for ground-water contamination Seasonal high water table
1226:	
Lawler, 24 to 40 inches to sand and gravel	Excessive permeability Potential for ground-water contamination Seasonal high water table
1285G:	
Burkhardt	Slope Excessive permeability Limited available water capacity Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
Bassett	Slope Potential for ground-water contamination Water erosion Seasonal high water table
Chelsea	Slope Excessive permeability Limited available water capacity Limited content of organic matter Potential for ground-water contamination Water erosion Wind erosion
1585:	
Spillville, frequently flooded	Flooding Channeled Potential for ground-water contamination Potential for surface-water contamination Seasonal high water table

Table 5.--Cropland Management Considerations--Continued

Map symbol and soil name	Cropland management considerations
1585:	
Coland, frequently flooded	Flooding Channeled Potential poor tilth and compaction Potential for ground-water contamination Potential for surface-water contamination Seasonal high water table
Aquolls, ponded	Channeled Ponding Potential for ground-water contamination Potential for surface-water contamination Seasonal high water table
1586:	
Sigglekov, frequently flooded	Flooding Channeled Excessive permeability Limited available water capacity Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Seasonal high water table Wind erosion
Fluvaquents, frequently flooded	Flooding Channeled Potential for ground-water contamination Potential for surface-water contamination Seasonal high water table
Aquents, ponded	Channeled Ponding Potential for ground-water contamination Potential for surface-water contamination Seasonal high water table
4000.	
Urban land	
4007:	
Wiota	Excessive permeability Potential for ground-water contamination
Urban land.	
4041:	
Sparta	Acid soil Excessive permeability Limited available water capacity Limited content of organic matter Potential for ground-water contamination Wind erosion
Urban land.	
4041B:	
Sparta	Acid soil Excessive permeability Limited available water capacity Limited content of organic matter Potential for ground-water contamination Wind erosion

Table 5.--Cropland Management Considerations--Continued

Map symbol and soil name	Cropland management considerations
4041B:	
Urban land.	
4041C:	
Sparta	Acid soil Excessive permeability Limited available water capacity Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Wind erosion
Urban land.	
4041D:	
Sparta	Acid soil Excessive permeability Limited available water capacity Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
Urban land.	
4063B:	
Chelsea	Excessive permeability Limited available water capacity Limited content of organic matter Potential for ground-water contamination Wind erosion
Urban land.	
4063C:	
Chelsea	Excessive permeability Limited available water capacity Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Wind erosion
Urban land.	
4063D:	
Chelsea	Excessive permeability Limited available water capacity Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
Urban land.	
4083B:	
Kenyon	Potential for ground-water contamination Potential for surface-water contamination Water erosion
Urban land.	

Table 5.--Cropland Management Considerations--Continued

Map symbol and soil name	Cropland management considerations
4083C:	
Kenyon	Potential for ground-water contamination Potential for surface-water contamination Water erosion
Urban land.	
4083D:	
Kenyon	Potential for ground-water contamination Potential for surface-water contamination Water erosion
Urban land.	
4084:	
Clyde	Potential for ground-water contamination Seasonal high water table
Urban land.	
4088:	
Nevin	Acid soil Potential for ground-water contamination Seasonal high water table
Urban land.	
4133:	
Colo, occasionally flooded	Flooding Potential for ground-water contamination Potential for surface-water contamination Seasonal high water table
Urban land.	
4135:	
Coland, occasionally flooded	Flooding Potential poor tilth and compaction Potential for ground-water contamination Potential for surface-water contamination Seasonal high water table
Urban land.	
4152:	
Marshan, 24 to 40 inches to sand and gravel	Excessive permeability Potential for ground-water contamination Seasonal high water table
Urban land.	
4159:	
Finchford	Acid soil Excessive permeability Limited available water capacity Limited content of organic matter Potential for ground-water contamination Wind erosion
Urban land.	

Table 5.--Cropland Management Considerations--Continued

Map symbol and soil name	Cropland management considerations
4159C:	
Finchford	Acid soil Excessive permeability Limited available water capacity Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Wind erosion
Urban land.	
4171B:	
Bassett	Potential for ground-water contamination Potential for surface-water contamination Water erosion Seasonal high water table
Urban land.	
4171D:	
Bassett	Potential for ground-water contamination Potential for surface-water contamination Water erosion Seasonal high water table
Urban land.	
4175:	
Dickinson	Excessive permeability Limited available water capacity Potential for ground-water contamination Wind erosion
Urban land.	
4175B:	
Dickinson	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
Urban land.	
4177:	
Saude	Acid soil Excessive permeability Potential for ground-water contamination
Urban land.	
4177B:	
Saude	Acid soil Excessive permeability Potential for ground-water contamination Potential for surface-water contamination Water erosion
Urban land.	

Table 5.--Cropland Management Considerations--Continued

Map symbol and soil name	Cropland management considerations
4178:	
Waukee	Acid soil Excessive permeability Potential for ground-water contamination
Urban land.	
4184:	
Klinger	Potential for ground-water contamination Seasonal high water table
Urban land.	
4198B:	
Floyd	Potential for ground-water contamination Potential for surface-water contamination Water erosion Seasonal high water table
Urban land.	
4226:	
Lawler, 24 to 40 inches to sand and gravel	Excessive permeability Potential for ground-water contamination Seasonal high water table
Urban land.	
4284:	
Flagler	Excessive permeability Limited available water capacity Potential for ground-water contamination Wind erosion
Urban land.	
4284B:	
Flagler	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
Urban land.	
4377B:	
Dinsdale	Potential for ground-water contamination Potential for surface-water contamination Water erosion
Urban land.	
4377C:	
Dinsdale	Potential for ground-water contamination Potential for surface-water contamination Water erosion
Urban land.	

Table 5.--Cropland Management Considerations--Continued

Map symbol and soil name	Cropland management considerations
4382:	
Maxfield	Potential poor tilth and compaction Potential for ground-water contamination Seasonal high water table
Urban land.	
4391B:	
Clyde	Potential for ground-water contamination Seasonal high water table
Floyd	Potential for ground-water contamination Potential for surface-water contamination Water erosion Seasonal high water table
Urban land.	
4398:	
Tripoli	Potential poor tilth and compaction Potential for ground-water contamination Seasonal high water table
Urban land.	
4399:	
Readlyn	Potential for ground-water contamination Seasonal high water table
Urban land.	
4408B:	
Olin	Acid soil Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
Urban land.	
4408C:	
Olin	Acid soil Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
Urban land.	
4426B:	
Aredale	Acid soil Potential for ground-water contamination Potential for surface-water contamination Water erosion
Urban land.	
4426C:	
Aredale	Acid soil Potential for ground-water contamination Potential for surface-water contamination Water erosion
Urban land.	

Table 5.--Cropland Management Considerations--Continued

Map symbol and soil name	Cropland management considerations
4585:	
Spillville, occasionally flooded	Flooding Potential for ground-water contamination Potential for surface-water contamination Seasonal high water table
Coland, occasionally flooded	Flooding Potential poor tilth and compaction Potential for ground-water contamination Potential for surface-water contamination Seasonal high water table
Urban land.	
4761:	
Franklin	Acid soil Potential for ground-water contamination Seasonal high water table
Urban land.	
4771B:	
Waubeek	Acid soil Potential for ground-water contamination Potential for surface-water contamination Water erosion
Urban land.	
4771D:	
Waubeek	Acid soil Potential for ground-water contamination Potential for surface-water contamination Water erosion
Urban land.	
4798:	
Protivin	Acid soil Potential for ground-water contamination Potential for surface-water contamination Seasonal high water table
Urban land.	
4911B:	
Colo	Flooding Potential for ground-water contamination Potential for surface-water contamination Seasonal high water table
Ely	Potential for ground-water contamination Potential for surface-water contamination Water erosion Seasonal high water table
Urban land.	

Table 5.--Cropland Management Considerations--Continued

Map symbol and soil name	Cropland management considerations
4933:	
Sawmill, occasionally flooded	Flooding Potential poor tilth and compaction Potential for ground-water contamination Potential for surface-water contamination Seasonal high water table
Urban land.	
4946:	
Orthents, loamy-------------	Onsite investigation required
Urban land.	
5010.	
Pits, sand and gravel	
5030.	
Pits, limestone quarries	
5040:	
Udorthents, loamy-----------	Onsite investigation required
5053:	
Psammaquents, frequently flooded--------------------	Flooding Potential for ground-water contamination Potential for surface-water contamination Seasonal high water table
5080:	
Orthents, sanitary landfill--	Onsite investigation required
AW.	
Animal waste	
SL.	
Sewage lagoon	
W.	
Water	

Table 6.--Land Capability, Corn Suitability Rating, Subsoil Phosphorus and Potassium, and Yields per Acre of Crops

(Yields are those that can be expected under a high level of management. They are for nonirrigated areas. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil. See text for an explanation of ratings in this table)

Map symbol and soil name	Land capability	Corn suitability rating	Subsoil phosphorus	Subsoil potassium	Bromegrass-alfalfa hay	Corn	Oats	Soybeans
					Tons	Bu	Bu	Bu
7 Wiota	1	95	L	L	6.8	194	98	55
41 Sparta	4s	45	L	L	3.4	81	48	27
41B Sparta	4s	40	L	L	3.2	77	46	26
41C Sparta	4s	25	L	L	3.0	72	43	24
41D Sparta	6s	13	L	L	2.6	---	38	---
63B Chelsea	4s	36	L	L	2.9	71	41	23
63C Chelsea	4s	21	L	L	2.6	69	38	21
63D Chelsea	6s	11	L	L	2.3	---	32	---
83B Kenyon	2e	86	L	L	6.6	192	92	48
83C Kenyon	3e	71	L	L	6.3	186	91	46
83C2 Kenyon, moderately eroded	3e	69	L	L	6.2	182	88	45
83D2 Kenyon, moderately eroded	3e	59	L	L	5.8	172	83	42
84 Clyde	2w	76	L	L	4.3	179	85	43

Table 6.--Land Capability, Corn Suitability Rating, Subsoil Phosphorus and Potassium, and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capability	Corn suitability rating	Subsoil phosphorus	Subsoil potassium	Bromegrass-alfalfa hay	Corn	Oats	Soybeans
					Tons	Bu	Bu	Bu
88---Nevin	1	90	L	L	6.5	198	98	55
133---Colo, occasionally flooded	2w	80	L	L	4.1	168	82	46
135---Coland, occasionally flooded	2w	80	L	L	4.1	168	82	41
159---Finchford	4s	30	L	L	2.3	58	32	18
159C---Finchford	4s	5	L	L	1.9	---	28	---
171B---Bassett	2e	81	L	L	6.2	167	88	45
175---Dickinson	3s	60	L	L	4.7	103	67	38
175B---Dickinson	3e	55	L	L	4.6	106	65	37
177---Saude	2s	63	L	L	4.5	109	64	33
177B---Saude	2e	58	L	L	4.4	99	62	32
178---Waukee	2s	79	L	L	5.5	137	79	40
178B---Waukee	2e	74	L	L	5.4	133	77	39
184---Klinger	1	90	L	L	6.4	197	95	53
198B---Floyd	2w	80	L	L	6.2	189	92	47

Table 6.--Land Capability, Corn Suitability Rating, Subsoil Phosphorus and Potassium, and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capability	Corn suitability rating	Subsoil phosphorus	Subsoil potassium	Bromegrass-alfalfa hay	Corn	Oats	Soybeans
					Tons	Bu	Bu	Bu
213B--------------------- Rockton, 30 to 40 inches to limestone	2e	71	L	L	5.2	117	74	38
221---------------------- Klossner	3w	50	L	L	3.5	142	69	35
284---------------------- Flagler	3s	50	L	L	3.7	86	52	29
284B--------------------- Flagler	3e	45	L	L	3.5	81	50	28
290---------------------- Dells	2w	74	L	L	5.0	133	76	42
354---------------------- Aquolls, ponded	7w	5	L	L	---	---	---	---
377B--------------------- Dinsdale	2e	90	L	L	6.7	198	96	54
377C--------------------- Dinsdale	3e	75	L	L	6.5	191	93	52
377C2-------------------- Dinsdale, moderately eroded	3e	73	L	L	6.3	188	91	51
382---------------------- Maxfield	2w	90	L	L	4.8	198	96	54
391B---------------------		72	L	L	4.2	181	84	43
Clyde--------------------	2w							
Floyd--------------------	2w							
395B--------------------- Marquis	2e	89	L	L	6.6	193	94	48
398---------------------- Tripoli	2w	81	L	L	4.7	193	93	47
399---------------------- Readlyn	1	91	L	L	6.4	196	95	48

Table 6.--Land Capability, Corn Suitability Rating, Subsoil Phosphorus and Potassium, and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capability	Corn suitability rating	Subsoil phosphorus	Subsoil potassium	Bromegrass-alfalfa hay	Corn	Oats	Soybeans
					Tons	Bu	Bu	Bu
408B--------------------- Olin	2e	66	L	L	5.5	132	79	44
408C--------------------- Olin	3e	51	L	L	5.3	125	76	42
412C--------------------- Emeline	4s	13	L	L	2.6	65	37	20
426B--------------------- Aredale	2e	85	L	L	6.3	189	89	45
426C--------------------- Aredale	3e	70	L	L	6.0	179	86	44
426C2-------------------- Aredale, moderately eroded	3e	68	L	L	5.9	176	84	43
468B--------------------- Dunkerton	2e	62	L	L	5.2	133	74	38
468C--------------------- Dunkerton	3e	47	L	L	5.0	123	71	36
471---------------------- Oran	1	86	L	L	6.0	189	90	46
485---------------------- Spillville, occasionally flooded	2w	92	L	L	6.2	183	94	48
585----------------------		60	L	L	4.4	171	88	45
Spillville, occasionally flooded----------------	2w							
Coland, occasionally flooded----------------	2w							
626---------------------- Hayfield, 24 to 40 inches to sand and gravel	2s	67	L	L	4.8	126	72	37
761---------------------- Franklin	1	90	L	L	6.2	190	92	52

Table 6.--Land Capability, Corn Suitability Rating, Subsoil Phosphorus and Potassium, and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capability	Corn suitability rating	Subsoil phosphorus	Subsoil potassium	Bromegrass-alfalfa hay	Corn	Oats	Soybeans
					Tons	Bu	Bu	Bu
771B--------------------- Waubeek	2e	87	L	L	6.5	183	93	52
775B--------------------- Billett	2e	52	L	L	4.2	101	60	31
776C--------------------- Lilah	4s	7	L	L	1.6	---	23	---
777---------------------- Wapsie	2s	58	L	L	4.0	100	57	29
781B--------------------- Lourdes	2e	62	L	L	5.0	123	74	38
781C2-------------------- Lourdes, moderately eroded	3e	47	L	L	4.6	115	69	35
782B--------------------- Donnan	2e	50	L	L	3.7	126	55	28
798---------------------- Protivin	2w	60	L	L	3.8	159	76	38
809B--------------------- Bertram	4s	25	L	L	2.1	62	29	15
877B--------------------- Dinsmore	2e	93	L	L	6.8	201	98	55
884---------------------- Klingmore	1	95	L	L	6.6	204	99	55
911B---------------------		75	L	L	4.3	180	86	48
Colo--------------------	2w							
Ely---------------------	2e							
933---------------------- Sawmill, occasionally flooded	2w	80	L	L	4.1	171	82	46
982---------------------- Maxmore	2w	93	L	L	4.9	201	98	55

Table 6.--Land Capability, Corn Suitability Rating, Subsoil Phosphorus and Potassium, and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capability	Corn suitability rating	Subsoil phosphorus	Subsoil potassium	Bromegrass-alfalfa hay	Corn	Oats	Soybeans
					Tons	Bu	Bu	Bu
1152-------------------- Marshan, 24 to 40 inches to sand and gravel	2w	68	L	L	3.6	126	72	36
1226-------------------- Lawler, 24 to 40 inches to sand and gravel	2s	72	L	L	5.2	135	77	39
1285G-------------------		5	L	L	---	---	---	---
Burkhardt---------------	7e							
Bassett-----------------	---							
Chelsea-----------------	---							
1585--------------------		5	L	L	---	---	---	---
Spillville, frequently flooded----------------	5w							
Coland, frequently flooded----------------	5w							
Aquolls, ponded---------	---							
1586--------------------		5	L	L	---	---	---	---
Sigglekov, frequently flooded----------------	5w							
Fluvaquents, frequently flooded----------------	7w							
Aquents, ponded---------	---							
4000. Urban land								
4007:								
Wiota-------------------	1	---	---	---	---	---	---	---
Urban land.								
4041:								
Sparta------------------	4s	---	---	---	---	---	---	---
Urban land.								
4041B:								
Sparta------------------	4s	---	---	---	---	---	---	---
Urban land.								
4041C:								
Sparta------------------	4s	---	---	---	---	---	---	---
Urban land.								

Table 6.--Land Capability, Corn Suitability Rating, Subsoil Phosphorus and Potassium, and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capability	Corn suitability rating	Subsoil phosphorus	Subsoil potassium	Bromegrass-alfalfa hay	Corn	Oats	Soybeans
					Tons	Bu	Bu	Bu
4041D:								
Sparta------------------	6s	---	---	---	---	---	---	---
Urban land.								
4063B:								
Chelsea-----------------	4s	---	---	---	---	---	---	---
Urban land.								
4063C:								
Chelsea-----------------	4s	---	---	---	---	---	---	---
Urban land.								
4063D:								
Chelsea-----------------	6s	---	---	---	---	---	---	---
Urban land.								
4083B:								
Kenyon------------------	2e	---	---	---	---	---	---	---
Urban land.								
4083C:								
Kenyon------------------	3e	---	---	---	---	---	---	---
Urban land.								
4083D:								
Kenyon------------------	3e	---	---	---	---	---	---	---
Urban land.								
4084:								
Clyde-------------------	2w	---	---	---	---	---	---	---
Urban land.								
4088:								
Nevin-------------------	1	---	---	---	---	---	---	---
Urban land.								
4133:								
Colo, occasionally flooded----------------	2w	---	---	---	---	---	---	---
Urban land.								
4135:								
Coland, occasionally flooded----------------	2w	---	---	---	---	---	---	---
Urban land.								

Table 6.--Land Capability, Corn Suitability Rating, Subsoil Phosphorus and Potassium, and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capability	Corn suitability rating	Subsoil phosphorus	Subsoil potassium	Bromegrass-alfalfa hay	Corn	Oats	Soybeans
					Tons	Bu	Bu	Bu
4152:								
Marshan, 24 to 40 inches to sand and gravel-----	2w	---	---	---	---	---	---	---
Urban land.								
4159:								
Finchford---------------	4s	---	---	---	---	---	---	---
Urban land.								
4159C:								
Finchford---------------	4s	---	---	---	---	---	---	---
Urban land.								
4171B:								
Bassett-----------------	2e	---	---	---	---	---	---	---
Urban land.								
4171D:								
Bassett-----------------	3e	---	---	---	---	---	---	---
Urban land.								
4175:								
Dickinson---------------	3s	---	---	---	---	---	---	---
Urban land.								
4175B:								
Dickinson---------------	3e	---	---	---	---	---	---	---
Urban land.								
4177:								
Saude-------------------	2s	---	---	---	---	---	---	---
Urban land.								
4177B:								
Saude-------------------	2e	---	---	---	---	---	---	---
Urban land.								
4178:								
Waukee------------------	2s	---	---	---	---	---	---	---
Urban land.								
4184:								
Klinger-----------------	1	---	---	---	---	---	---	---
Urban land.								

Table 6.--Land Capability, Corn Suitability Rating, Subsoil Phosphorus and Potassium, and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capability	Corn suitability rating	Subsoil phosphorus	Subsoil potassium	Bromegrass-alfalfa hay	Corn	Oats	Soybeans
					Tons	Bu	Bu	Bu
4198B:								
Floyd	2w	---	---	---	---	---	---	---
Urban land.								
4226:								
Lawler, 24 to 40 inches to sand and gravel	2s	---	---	---	---	---	---	---
Urban land.								
4284:								
Flagler	3s	---	---	---	---	---	---	---
Urban land.								
4284B:								
Flagler	3e	---	---	---	---	---	---	---
Urban land.								
4377B:								
Dinsdale	2e	---	---	---	---	---	---	---
Urban land.								
4377C:								
Dinsdale	3e	---	---	---	---	---	---	---
Urban land.								
4382:								
Maxfield	2w	---	---	---	---	---	---	---
Urban land.								
4391B		---	---	---	---	---	---	---
Clyde	2w							
Floyd	2w							
Urban land.								
4398:								
Tripoli	2w	---	---	---	---	---	---	---
Urban land.								
4399:								
Readlyn	1	---	---	---	---	---	---	---
Urban land.								
4408B:								
Olin	2e	---	---	---	---	---	---	---
Urban land.								

Table 6.--Land Capability, Corn Suitability Rating, Subsoil Phosphorus and Potassium, and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capability	Corn suitability rating	Subsoil phosphorus	Subsoil potassium	Bromegrass-alfalfa hay	Corn	Oats	Soybeans
					Tons	Bu	Bu	Bu
4408C:								
Olin--------------------	3e	---	---	---	---	---	---	---
Urban land.								
4426B:								
Aredale-----------------	2e	---	---	---	---	---	---	---
Urban land.								
4426C:								
Aredale-----------------	3e							
Urban land.								
4585--------------------		---	---	---	---	---	---	---
Spillville, occasionally flooded----------------	2w							
Coland, occasionally flooded----------------	2w							
Urban land.								
4761:								
Franklin----------------	1	---	---	---	---	---	---	---
Urban land.								
4771B:								
Waubeek-----------------	2e	---	L	L	---	---	---	---
Urban land.								
4771D:								
Waubeek-----------------	2e	---	---	---	---	---	---	---
Urban land.								
4798:								
Protivin----------------	2w	---	---	---	---	---	---	---
Urban land.								
4911B-------------------		---	---	---	---	---	---	---
Colo--------------------	2w							
Ely---------------------	2e							
Urban land.								
4933:								
Sawmill, occasionally flooded----------------	2w	---	---	---	---	---	---	---
Urban land.								

Table 6.--Land Capability, Corn Suitability Rating, Subsoil Phosphorus and Potassium, and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capability	Corn suitability rating	Subsoil phosphorus	Subsoil potassium	Bromegrass-alfalfa hay	Corn	Oats	Soybeans
					Tons	Bu	Bu	Bu
4946:								
Orthents, loamy.								
Urban land.								
5010.								
Pits, sand and gravel								
5030.								
Pits, limestone quarries								
5040.								
Orthents, loamy								
5053.								
Psammaquents, frequently flooded								
5080.								
Orthents, sanitary landfill								
AW.								
Animal waste								
SL.								
Sewage lagoon								
W.								
Water								

Table 7.--Land Capability and Yields per Acre of Pasture

(Yields are those that can be expected under a high level of management. They are for nonirrigated areas. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Map symbol and soil name	Land capability	Bromegrass-alfalfa	Kentucky bluegrass	Smooth bromegrass
		AUM*	AUM*	AUM*
7: Wiota	1	11.4	4.0	6.7
41: Sparta	4s	5.6	2.0	3.3
41B: Sparta	4s	5.4	1.9	3.2
41C: Sparta	4s	5.1	1.8	3.0
41D: Sparta	6s	4.3	1.5	2.6
63B: Chelsea	4s	4.8	1.7	2.8
63C: Chelsea	4s	4.4	1.5	2.6
63D: Chelsea	6s	3.8	1.3	2.2
83B: Kenyon	2e	10.9	3.8	6.4
83C: Kenyon	3e	10.6	3.7	6.2
83C2: Kenyon, moderately eroded	3e	10.3	3.6	6.0
83D2: Kenyon, moderately eroded	3e	9.7	3.4	5.7
84: Clyde	2w	7.1	3.5	5.8
88: Nevin	1	10.9	4.0	6.7
133: Colo, occasionally flooded	2w	6.8	3.3	5.6
135: Coland, occasionally flooded	2w	6.8	3.3	5.6

See footnote at end of table.

Table 7.--Land Capability and Yields per Acre of Pasture--Continued

Map symbol and soil name	Land capability	Bromegrass-alfalfa	Kentucky bluegrass	Smooth bromegrass
		AUM*	AUM*	AUM*
159-----Finchford	4s	3.8	1.3	2.2
159C-----Finchford	4s	3.2	1.1	1.9
171B-----Bassett	2e	10.3	3.6	6.0
175-----Dickinson	3s	7.9	2.7	4.6
175B-----Dickinson	3e	7.6	2.7	4.5
177-----Saude	2s	7.5	2.6	4.4
177B-----Saude	2e	7.3	2.5	4.3
178-----Waukee	2s	9.3	3.2	5.4
178B-----Waukee	2e	9.0	3.2	5.3
184-----Klinger	1	10.6	3.9	6.5
198B-----Floyd	2w	10.3	3.8	6.3
213B-----Rockton, 30 to 40 inches to limestone	2e	8.7	3.0	5.1
221-----Klossner	3w	5.8	2.8	4.7
284-----Flagler	3s	6.1	2.1	3.6
284B-----Flagler	3e	5.9	2.1	3.4
290-----Dells	2w	8.4	3.1	5.2
354-----Aquolls, ponded	7w	---	---	---
377B-----Dinsdale	2e	11.2	3.9	6.6
377C-----Dinsdale	3e	10.9	3.8	6.4

See footnote at end of table.

Table 7.--Land Capability and Yields per Acre of Pasture--Continued

Map symbol and soil name	Land capability	Bromegrass-alfalfa	Kentucky bluegrass	Smooth bromegrass
		AUM*	AUM*	AUM*
377C2-------------------- Dinsdale, moderately eroded	3e	10.6	3.7	6.2
382--------------------- Maxfield	2w	8.0	3.9	6.6
391B--------------------		7.0	3.4	5.7
Clyde-------------------	2w			
Floyd-------------------	2w			
395B-------------------- Marquis	2e	11.0	3.8	6.4
398--------------------- Tripoli	2w	7.8	3.8	6.4
399--------------------- Readlyn	1	10.6	3.9	6.5
408B-------------------- Olin	2e	9.2	3.2	5.4
408C-------------------- Olin	3e	8.8	3.1	5.2
412C-------------------- Emeline	4s	4.3	1.5	2.5
426B-------------------- Aredale	2e	10.5	3.7	6.1
426C-------------------- Aredale	3e	10.1	3.5	5.9
426C2------------------- Aredale, moderately eroded	3e	9.8	3.4	5.7
468B-------------------- Dunkerton	2e	8.7	3.0	5.1
468C-------------------- Dunkerton	3e	8.3	2.9	4.9
471--------------------- Oran	1	10.0	3.7	6.2
485--------------------- Spillville, occasionally flooded	2w	10.4	3.8	6.4
585---------------------		7.3	3.6	6.0
Spillville, occasionally flooded----------------	2w			
Coland, occasionally flooded----------------	2w			

See footnote at end of table.

Table 7.--Land Capability and Yields per Acre of Pasture--Continued

Map symbol and soil name	Land capability	Bromegrass-alfalfa	Kentucky bluegrass	Smooth bromegrass
		AUM*	AUM*	AUM*
626: Hayfield, 24 to 40 inches to sand and gravel	2s	8.0	2.9	4.9
761: Franklin	1	10.3	3.8	6.3
771B: Waubeek	2e	10.9	3.8	6.4
775B: Billett	2e	7.1	2.5	4.1
776C: Lilah	4s	2.7	0.9	1.6
777: Wapsie	2s	6.7	2.3	3.9
781B: Lourdes	2e	8.3	3.0	5.1
781C2: Lourdes, moderately eroded	3e	7.7	2.8	4.7
782B: Donnan	2e	6.1	2.3	3.8
798: Protivin	2w	6.3	3.1	5.2
809B: Bertram	4s	3.4	1.2	2.0
877B: Dinsmore	2e	11.4	4.0	6.7
884: Klingmore	1	11.0	4.0	6.8
911B:		7.2	3.5	5.9
Colo	2w			
Ely	2e			
933: Sawmill, occasionally flooded	2w	6.8	3.3	5.6
982: Maxmore	2w	8.2	4.0	6.7
1152: Marshan, 24 to 40 inches to sand and gravel	2w	6.0	3.0	4.8
1226: Lawler, 24 to 40 inches to sand and gravel	2s	8.7	3.2	5.3

See footnote at end of table.

Table 7.--Land Capability and Yields per Acre of Pasture--Continued

Map symbol and soil name	Land capability	Bromegrass-alfalfa	Kentucky bluegrass	Smooth bromegrass
		AUM*	AUM*	AUM*
1285G		---	0.4	---
Burkhardt	7e			
Bassett	---			
Chelsea	---			
1585		---	3.6	---
Spillville, frequently flooded	5w			
Coland, frequently flooded	5w			
Aquolls, ponded	---			
1586		---	1.5	---
Sigglekov, frequently flooded	5w			
Fluvaquents, frequently flooded	7w			
Aquents, ponded	---			
4000. Urban land				
4007:				
Wiota	1	---	---	---
Urban land.				
4041:				
Sparta	4s	---	---	---
Urban land.				
4041B:				
Sparta	4s	---	---	---
Urban land.				
4041C:				
Sparta	4s	---	---	---
Urban land.				
4041D:				
Sparta	6s	---	---	---
Urban land.				
4063B:				
Chelsea	4s	---	---	---
Urban land.				
4063C:				
Chelsea	4s	---	---	---
Urban land.				
4063D:				
Chelsea	6s	---	---	---
Urban land.				
4083B:				
Kenyon	2e	---	---	---
Urban land.				

See footnote at end of table.

Table 7.--Land Capability and Yields per Acre of Pasture--Continued

Map symbol and soil name	Land capability	Bromegrass-alfalfa	Kentucky bluegrass	Smooth bromegrass
		AUM*	AUM*	AUM*
4083C:				
Kenyon	3e	---	---	---
Urban land.				
4083D:				
Kenyon	3e	---	---	---
Urban land.				
4084:				
Clyde	2w	---	---	---
Urban land.				
4088:				
Nevin	1	---	---	---
Urban land.				
4133:				
Colo, occasionally flooded	2w	---	---	---
Urban land.				
4135:				
Coland, occasionally flooded	2w	---	---	---
Urban land.				
4152:				
Marshan, 24 to 40 inches to sand and gravel	2w	---	---	---
Urban land.				
4159:				
Finchford	4s	---	---	---
Urban land.				
4159C:				
Finchford	4s	---	---	---
Urban land.				
4171B:				
Bassett	2e	---	---	---
Urban land.				
4171D:				
Bassett	3e	---	---	---
Urban land.				
4175:				
Dickinson	3s	---	---	---
Urban land.				
4175B:				
Dickinson	3e	---	---	---
Urban land.				
4177:				
Saude	2s	---	---	---
Urban land.				

See footnote at end of table.

Table 7.--Land Capability and Yields per Acre of Pasture--Continued

Map symbol and soil name	Land capability	Bromegrass-alfalfa	Kentucky bluegrass	Smooth bromegrass
		AUM*	AUM*	AUM*
4177B:				
Saude	2e	---	---	---
Urban land.				
4178:				
Waukee	2s	---	---	---
Urban land.				
4184:				
Klinger	1	---	---	---
Urban land.				
4198B:				
Floyd	2w	---	---	---
Urban land.				
4226:				
Lawler, 24 to 40 inches to sand and gravel	2s	---	---	---
Urban land.				
4284:				
Flagler	3s	---	---	---
Urban land.				
4284B:				
Flagler	3e	---	---	---
Urban land.				
4377B:				
Dinsdale	2e	---	---	---
Urban land.				
4377C:				
Dinsdale	3e	---	---	---
Urban land.				
4382:				
Maxfield	2w	---	---	---
Urban land.				
4391B		---	---	---
Clyde	2w			
Floyd	2w			
Urban land.				
4398:				
Tripoli	2w	---	---	---
Urban land.				
4399:				
Readlyn	1	---	---	---
Urban land.				
4408B:				
Olin	2e	---	---	---
Urban land.				

See footnote at end of table.

Table 7.--Land Capability and Yields per Acre of Pasture--Continued

Map symbol and soil name	Land capability	Bromegrass-alfalfa	Kentucky bluegrass	Smooth bromegrass
		AUM*	AUM*	AUM*
4408C:				
Olin	3e	---	---	---
Urban land.				
4426B:				
Aredale	2e	---	---	---
Urban land.				
4426C:				
Aredale	3e	---	---	---
Urban land.				
4585		---	---	---
Spillville, occasionally flooded	2w			
Coland, occasionally flooded	2w			
Urban land.				
4761:				
Franklin	1	---	---	---
Urban land.				
4771B:				
Waubeek	2e	---	---	---
Urban land.				
4771D:				
Waubeek	2e	---	---	---
Urban land.				
4798:				
Protivin	2w	---	---	---
Urban land.				
4911B		---	---	---
Colo	2w			
Ely	2e			
Urban land.				
4933:				
Sawmill, occasionally flooded	2w	---	---	---
Urban land.				
4946:				
Orthents, loamy.				
Urban land.				
5010.				
Pits, sand and gravel				
5030.				
Pits, limestone quarries				
5040.				
Orthents, loamy				

See footnote at end of table.

Table 7.--Land Capability and Yields per Acre of Pasture--Continued

Map symbol and soil name	Land capability	Bromegrass-alfalfa	Kentucky bluegrass	Smooth bromegrass
		AUM*	AUM*	AUM*
5053. Psammaquents, frequently flooded				
5080. Orthents, sanitary landfill				
AW. Animal waste				
SL. Sewage lagoon				
W. Water				

* Animal unit month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five goats, or five sheep) for 30 days.

Table 8.--Prime Farmland

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland. If a soil is prime farmland only under certain conditions, the conditions are specified in parentheses after the soil name)

Map symbol	Soil name
7	Wiota silty clay loam, 0 to 2 percent slopes
83B	Kenyon loam, 2 to 5 percent slopes
84	Clyde silty clay loam, 0 to 3 percent slopes (where drained)
88	Nevin silty clay loam, 0 to 2 percent slopes
133	Colo silty clay loam, 0 to 2 percent slopes, occasionally flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
135	Coland clay loam, 0 to 2 percent slopes, occasionally flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
171B	Bassett loam, 2 to 5 percent slopes
175	Dickinson fine sandy loam, 0 to 2 percent slopes
175B	Dickinson fine sandy loam, 2 to 5 percent slopes
177	Saude loam, 0 to 2 percent slopes
177B	Saude loam, 2 to 5 percent slopes
178	Waukee loam, 0 to 2 percent slopes
178B	Waukee loam, 2 to 5 percent slopes
184	Klinger silty clay loam, 1 to 3 percent slopes
198B	Floyd loam, 1 to 4 percent slopes
213B	Rockton loam, 30 to 40 inches to limestone, 2 to 5 percent slopes
290	Dells silt loam, 0 to 2 percent slopes
377B	Dinsdale silty clay loam, 2 to 5 percent slopes
382	Maxfield silty clay loam, 0 to 2 percent slopes (where drained)
391B	Clyde-Floyd complex, 1 to 4 percent slopes (where drained)
395B	Marquis loam, 2 to 5 percent slopes
398	Tripoli clay loam, 0 to 2 percent slopes (where drained)
399	Readlyn loam, 1 to 3 percent slopes
408B	Olin fine sandy loam, 2 to 5 percent slopes
426B	Aredale loam, 2 to 5 percent slopes
468B	Dunkerton sandy loam, 2 to 5 percent slopes
471	Oran loam, 1 to 3 percent slopes (where drained)
485	Spillville loam, 0 to 2 percent slopes, occasionally flooded (where protected from flooding or not frequently flooded during the growing season)
585	Spillville-Coland complex, 0 to 2 percent slopes, occasionally flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
626	Hayfield loam, 24 to 40 inches to sand and gravel, 0 to 2 percent slopes
761	Franklin silt loam, 1 to 3 percent slopes
771B	Waubeek silt loam, 2 to 5 percent slopes
775B	Billett sandy loam, 2 to 5 percent slopes
777	Wapsie loam, 1 to 3 percent slopes
781B	Lourdes loam, 2 to 5 percent slopes
782B	Donnan loam, 2 to 5 percent slopes
798	Protivin loam, 1 to 3 percent slopes
877B	Dinsmore silty clay loam, 2 to 5 percent slopes
884	Klingmore silty clay loam, 1 to 3 percent slopes
911B	Colo-Ely complex, 2 to 5 percent slopes (where drained and either protected from flooding or not frequently flooded during the growing season)
933	Sawmill silty clay loam, 0 to 2 percent slopes, occasionally flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
982	Maxmore silty clay loam, 0 to 2 percent slopes (where drained)
1152	Marshan clay loam, 24 to 40 inches to sand and gravel, 0 to 2 percent slopes (where drained)
1226	Lawler loam, 24 to 40 inches to sand and gravel, 0 to 2 percent slopes

Table 9.--Windbreaks and Environmental Plantings

(Absence of an entry indicates that trees generally do not grow to the given height)

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
7:					
Wiota	Silky dogwood	American cranberrybush, Amur honeysuckle, Amur privet	Washington hawthorn, blue spruce, eastern arborvitae, white fir	Austrian pine, Norway spruce	Pin oak, eastern white pine
41, 41B.					
Sparta					
41C:					
Sparta	Siberian peashrub, common lilac	Eastern redcedar	Russian olive, jack pine, red pine, Austrian pine, Siberian elm, green ash, honeylocust	Eastern white pine	---
41D:					
Sparta	Siberian peashrub, gray dogwood, manyflower cotoneaster, silky dogwood	American cranberrybush, Amur maple, common lilac, eastern redcedar	Norway spruce	Eastern white pine, jack pine, red pine	---
63B:					
Chelsea	Siberian peashrub, common lilac	Eastern redcedar	Jack pine, red pine, Austrian pine	Eastern white pine	---
63C:					
Chelsea	Siberian peashrub, common lilac	Eastern redcedar	Jack pine, red pine, Austrian pine	Eastern white pine	---
63D:					
Chelsea	Siberian peashrub, common lilac	Eastern redcedar	Jack pine, red pine, Austrian pine	Eastern white pine	---
83B:					
Kenyon	---	Siberian peashrub, common lilac, gray dogwood, redosier dogwood	Eastern arborvitae, eastern redcedar, Amur maple, blue spruce	Russian olive, common hackberry, green ash, eastern white pine	---

Table 9.--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
83C: Kenyon	---	Siberian peashrub, common lilac, gray dogwood, redosier dogwood	Eastern arborvitae, eastern redcedar, Amur maple, blue spruce	Russian olive, common hackberry, green ash, eastern white pine	---
83C2: Kenyon, moderately eroded	---	Siberian peashrub, common lilac, gray dogwood, redosier dogwood	Eastern arborvitae, eastern redcedar, Amur maple, blue spruce	Russian olive, common hackberry, green ash, eastern white pine	---
83D2: Kenyon, moderately eroded	---	Siberian peashrub, common lilac, gray dogwood, redosier dogwood	Eastern arborvitae, eastern redcedar, Amur maple, blue spruce	Russian olive, common hackberry, green ash, eastern white pine	---
84: Clyde	---	American plum, redosier dogwood	Amur maple, eastern arborvitae, white spruce, common hackberry, tall purple willow	Golden willow	Green ash, silver maple, eastern cottonwood
88: Nevin	Silky dogwood	American cranberrybush, Amur honeysuckle, Amur privet	Washington hawthorn, blue spruce, eastern arborvitae, white fir	Austrian pine, Norway spruce	Pin oak, eastern white pine
133: Colo, occasionally flooded	---	American plum, redosier dogwood	Amur maple, white fir, white spruce, common hackberry, tall purple willow	Golden willow	Green ash, silver maple, eastern cottonwood
135: Coland, occasionally flooded	---	American plum, cotoneaster, redosier dogwood	Amur maple, eastern arborvitae, white spruce, common hackberry, tall purple willow	Golden willow	Green ash, silver maple, eastern cottonwood

Table 9.--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
159:					
Finchford	Siberian peashrub, common lilac	Sargent crabapple, eastern redcedar	Russian olive, jack pine, red pine, Austrian pine, Siberian elm, green ash	Eastern white pine	---
159C:					
Finchford	Siberian peashrub, common lilac	Sargent crabapple, eastern redcedar	Russian olive, jack pine, red pine, Austrian pine, Siberian elm, green ash	Eastern white pine	---
171B:					
Bassett	---	Siberian peashrub, common lilac, gray dogwood, redosier dogwood	Eastern arborvitae, eastern redcedar, Amur maple, blue spruce	Russian olive, common hackberry, green ash, eastern white pine	---
175:					
Dickinson	Common lilac	Siberian peashrub, Russian olive, eastern redcedar	Amur maple, common hackberry, red pine, eastern white pine, green ash	Norway spruce, honeylocust	---
175B:					
Dickinson	Common lilac	Siberian peashrub, Russian olive, eastern redcedar	Amur maple, common hackberry, red pine, eastern white pine, green ash	Norway spruce, honeylocust	---
177:					
Saude	Siberian peashrub, common lilac	Manchurian crabapple, common hackberry, eastern redcedar	Russian olive, bur oak, green ash, eastern white pine, jack pine, honeylocust	---	---
177B:					
Saude	Siberian peashrub, common lilac	Manchurian crabapple, common hackberry, eastern redcedar	Russian olive, bur oak, green ash, eastern white pine, jack pine, honeylocust	---	---

Table 9.--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
178: Waukee	Siberian peashrub, common lilac	Manchurian crabapple, common hackberry, eastern redcedar	Russian olive, bur oak, green ash, eastern white pine, jack pine, honeylocust	---	---
178B: Waukee	Siberian peashrub, common lilac	Manchurian crabapple, common hackberry, eastern redcedar	Russian olive, bur oak, green ash, eastern white pine, jack pine, honeylocust	---	---
184: Klinger	---	Common lilac, redosier dogwood	Eastern arborvitae, white spruce, Amur maple, blue spruce	Austrian pine, eastern white pine, common hackberry, green ash	Silver maple
198B: Floyd	---	Common lilac, redosier dogwood	Eastern arborvitae, white spruce, Amur maple, blue spruce	Austrian pine, eastern white pine, common hackberry, green ash	Silver maple
213B: Rockton, 30 to 40 inches to limestone	Siberian peashrub, common lilac, cotoneaster	Eastern redcedar	Manchurian crabapple, Russian olive, common hackberry, eastern white pine, green ash, jack pine	Siberian elm, honeylocust	---
221: Klossner	Common ninebark, silky dogwood	American cranberrybush, nannyberry	Black Hills spruce, eastern arborvitae, white spruce	Manchurian crabapple, Norway spruce, eastern white pine, green ash	Imperial Carolina poplar

Table 9.--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
284:					
Flagler	Siberian peashrub, common lilac	Manchurian crabapple, common hackberry, eastern redcedar	Russian olive, bur oak, green ash, eastern white pine, jack pine, honeylocust	---	---
284B:					
Flagler	Siberian peashrub, common lilac	Manchurian crabapple, common hackberry, eastern redcedar	Russian olive, bur oak, green ash, eastern white pine, jack pine, honeylocust	---	---
290:					
Dells	Nannyberry, redosier dogwood	American cranberrybush, common lilac, silky dogwood, eastern arborvitae	White spruce	Eastern white pine, red maple, red pine, silver maple, white ash	---
354.					
Aquolls, ponded					
377B:					
Dinsdale	---	Siberian peashrub, common lilac, gray dogwood, redosier dogwood	Eastern arborvitae, eastern redcedar, Amur maple, blue spruce	Russian olive, common hackberry, green ash, eastern white pine	---
377C:					
Dinsdale	---	Siberian peashrub, common lilac, gray dogwood, redosier dogwood	Eastern arborvitae, eastern redcedar, Amur maple, blue spruce	Russian olive, common hackberry, green ash, eastern white pine	---
377C2:					
Dinsdale, moderately eroded	---	Siberian peashrub, common lilac, gray dogwood, redosier dogwood	Eastern arborvitae, eastern redcedar, Amur maple, blue spruce	Russian olive, common hackberry, green ash, eastern white pine	---

Table 9.--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
382:					
Maxfield	---	American plum, redosier dogwood	Amur maple, eastern arborvitae, white spruce, common hackberry, tall purple willow	Golden willow	Green ash, silver maple, eastern cottonwood
391B:					
Clyde	---	American plum, redosier dogwood	Amur maple, eastern arborvitae, white spruce, common hackberry, tall purple willow	Golden willow	Green ash, silver maple, eastern cottonwood
Floyd	---	Common lilac, redosier dogwood	Eastern arborvitae, white spruce, Amur maple, blue spruce	Austrian pine, eastern white pine, common hackberry, green ash	Silver maple
395B:					
Marquis	---	Siberian peashrub, common lilac, gray dogwood, redosier dogwood	Eastern arborvitae, eastern redcedar, Amur maple, blue spruce	Russian olive, common hackberry, green ash, eastern white pine	---
398:					
Tripoli	---	Siberian peashrub, common lilac, eastern arborvitae	Eastern redcedar, bur oak, white spruce, common hackberry	Green ash, golden willow, honeylocust	Eastern cottonwood
399:					
Readlyn	---	Common lilac, redosier dogwood	Eastern arborvitae, white spruce, Amur maple, blue spruce	Austrian pine, eastern white pine, common hackberry, green ash	Silver maple
408B:					
Olin	Common lilac	Siberian peashrub, cotoneaster, Russian olive, eastern redcedar	Amur maple, common hackberry, red pine, eastern white pine, green ash	Norway spruce, honeylocust	---

Table 9.--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
408C:					
Olin	Common lilac	Siberian peashrub, cotoneaster, Russian olive, eastern redcedar	Amur maple, common hackberry, red pine, eastern white pine, green ash	Norway spruce, honeylocust	---
412C. Emeline					
426B, 426C, 426C2. Aredale					
468B:					
Dunkerton	Common lilac	Siberian peashrub, cotoneaster, Russian olive, eastern redcedar	Amur maple, common hackberry, red pine, eastern white pine, green ash	Norway spruce, honeylocust	---
468C:					
Dunkerton	Common lilac	Siberian peashrub, cotoneaster, Russian olive, eastern redcedar	Amur maple, common hackberry, red pine, eastern white pine, green ash	Norway spruce, honeylocust	---
471:					
Oran	---	Common lilac, redosier dogwood	Eastern arborvitae, white spruce, Amur maple, blue spruce	Austrian pine, eastern white pine, common hackberry, green ash	Silver maple
485:					
Spillville, occasionally flooded	---	Common lilac, redosier dogwood	Eastern arborvitae, white spruce, Amur maple, blue spruce	Austrian pine, eastern white pine, common hackberry, green ash	Silver maple
585:					
Spillville, occasionally flooded	---	Common lilac, redosier dogwood	Eastern arborvitae, white spruce, Amur maple, blue spruce	Austrian pine, eastern white pine, common hackberry, green ash	Silver maple

Table 9.--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
585: Coland, occasionally flooded	---	American plum, cotoneaster, redosier dogwood	Amur maple, eastern arborvitae, white spruce, common hackberry, tall purple willow	Golden willow	Green ash, silver maple, eastern cottonwood
626: Hayfield, 24 to 40 inches to sand and gravel	Nannyberry, redosier dogwood, silky dogwood	American cranberrybush, common lilac, eastern arborvitae	White spruce	Eastern white pine, red maple, red pine, silver maple, white ash	---
761: Franklin	---	Common lilac, redosier dogwood	Eastern arborvitae, white spruce, Amur maple, blue spruce	Austrian pine, eastern white pine, common hackberry, green ash	Silver maple
771B: Waubeek	---	Siberian peashrub, common lilac, gray dogwood, redosier dogwood	Eastern arborvitae, eastern redcedar, Amur maple, blue spruce	Russian olive, common hackberry, green ash, eastern white pine	---
775B: Billett	Siberian peashrub, gray dogwood, manyflower cotoneaster, silky dogwood	American cranberrybush, Amur maple, common lilac, eastern redcedar	Norway spruce	Eastern white pine, jack pine, red pine	---
776C: Lilah	Siberian peashrub, common lilac	Eastern redcedar	Jack pine, red pine, Austrian pine	Eastern white pine	---
777: Wapsie	Siberian peashrub, common lilac	Manchurian crabapple, common hackberry, eastern redcedar	Russian olive, bur oak, green ash, eastern white pine, jack pine, honeylocust	---	---

Table 9.--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
781B:					
Lourdes	---	Siberian peashrub, common lilac, gray dogwood, redosier dogwood	Eastern arborvitae, eastern redcedar, Amur maple, blue spruce	Russian olive, common hackberry, green ash, eastern white pine	---
781C2:					
Lourdes, moderately eroded	---	Siberian peashrub, common lilac, gray dogwood, redosier dogwood	Eastern arborvitae, eastern redcedar, Amur maple, blue spruce	Russian olive, common hackberry, green ash, eastern white pine	---
782B:					
Donnan	---	Common lilac, redosier dogwood	Eastern arborvitae, white spruce, Amur maple, blue spruce	Austrian pine, eastern white pine, common hackberry, green ash	Silver maple
798:					
Protivin	Gray dogwood, silky dogwood	American plum, redosier dogwood	Amur maple, eastern redcedar	Norway spruce, common hackberry, red pine	Silver maple, eastern cottonwood
809B:					
Bertram	Siberian peashrub, common lilac	Eastern redcedar	Manchurian crabapple, Russian olive, common hackberry, eastern white pine, green ash	Siberian elm, honeylocust	---
877B:					
Dinsmore	Silky dogwood	American cranberrybush, Amur honeysuckle, Amur privet	Washington hawthorn, blue spruce, eastern arborvitae, white fir	Austrian pine, Norway spruce	Pin oak, eastern white pine
884:					
Klingmore	Silky dogwood	American cranberrybush, Amur honeysuckle, Amur privet	Washington hawthorn, blue spruce, eastern arborvitae, white fir	Austrian pine, Norway spruce	Pin oak, eastern white pine

Table 9.--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
911B:					
Colo	---	American plum, redosier dogwood	Amur maple, white fir, white spruce, common hackberry, tall purple willow	Golden willow	Green ash, silver maple, eastern cottonwood
Ely	Silky dogwood	American cranberrybush, Amur honeysuckle, Amur privet	Washington hawthorn, blue spruce, eastern arborvitae, white fir	Austrian pine, Norway spruce	Pin oak, eastern white pine
933:					
Sawmill, occasionally flooded	---	American plum, redosier dogwood	Amur maple, eastern arborvitae, white spruce, common hackberry, tall purple willow	Golden willow	Green ash, silver maple, eastern cottonwood
982:					
Maxmore	---	American plum, redosier dogwood	Amur maple, eastern arborvitae, white spruce, common hackberry, tall purple willow	Golden willow	Green ash, silver maple, eastern cottonwood
1152:					
Marshan, 24 to 40 inches to sand and gravel	Common ninebark, nannyberry, redosier dogwood, silky dogwood	American cranberrybush, eastern arborvitae	Balsam fir, white spruce	Green ash, red maple, silver maple, white ash	---
1226:					
Lawler, 24 to 40 inches to sand and gravel	---	Common lilac, redosier dogwood	Eastern arborvitae, white spruce, Amur maple, blue spruce	Austrian pine, eastern white pine, common hackberry, green ash	Silver maple
1285G:					
Burkhardt	Siberian peashrub, gray dogwood, manyflower cotoneaster, silky dogwood	American cranberrybush, Amur maple, common lilac, eastern redcedar	Norway spruce	Eastern white pine, jack pine, red pine	---

Table 9.--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
1285G:					
Bassett.					
Chelsea.					
1585:					
Spillville, frequently flooded	---	Common lilac, redosier dogwood	Eastern arborvitae, white spruce, Amur maple, blue spruce	Austrian pine, eastern white pine, common hackberry, green ash	Silver maple
Coland, frequently flooded.					
Aquolls, ponded.					
1586:					
Sigglekov, frequently flooded.					
Fluvaquents, frequently flooded.					
Aquents, ponded.					
4000.					
Urban land					
4007:					
Wiota	Silky dogwood	American cranberrybush, Amur honeysuckle, Amur privet	Washington hawthorn, blue spruce, eastern arborvitae, white fir	Austrian pine, Norway spruce	Pin oak, eastern white pine
Urban land.					
4041, 4041B.					
Sparta-Urban land					
4041C:					
Sparta	Siberian peashrub, common lilac	Eastern redcedar	Russian olive, jack pine, red pine, Austrian pine, Siberian elm, green ash, honeylocust	Eastern white pine	---

Table 9.--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
4041C:					
Urban land.					
4041D:					
Sparta	Siberian peashrub, gray dogwood, manyflower cotoneaster, silky dogwood	American cranberrybush, Amur maple, common lilac, eastern redcedar	Norway spruce	Eastern white pine, jack pine, red pine	---
Urban land.					
4063B:					
Chelsea	Siberian peashrub, common lilac	Eastern redcedar	Jack pine, red pine, Austrian pine	Eastern white pine	---
Urban land.					
4063C:					
Chelsea	Siberian peashrub, common lilac	Eastern redcedar	Jack pine, red pine, Austrian pine	Eastern white pine	---
Urban land.					
4063D:					
Chelsea	Siberian peashrub, common lilac	Eastern redcedar	Jack pine, red pine, Austrian pine	Eastern white pine	---
Urban land.					
4083B:					
Kenyon	---	Siberian peashrub, common lilac, gray dogwood, redosier dogwood	Eastern arborvitae, eastern redcedar, Amur maple, blue spruce	Russian olive, common hackberry, green ash, eastern white pine	---
Urban land.					
4083C:					
Kenyon	---	Siberian peashrub, common lilac, gray dogwood, redosier dogwood	Eastern arborvitae, eastern redcedar, Amur maple, blue spruce	Russian olive, common hackberry, green ash, eastern white pine	---
Urban land.					

Table 9.--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
4083D:					
Kenyon	---	Siberian peashrub, common lilac, gray dogwood, redosier dogwood	Eastern arborvitae, eastern redcedar, Amur maple, blue spruce	Russian olive, common hackberry, green ash, eastern white pine	---
Urban land.					
4084:					
Clyde	---	American plum, redosier dogwood	Amur maple, eastern arborvitae, white spruce, common hackberry, tall purple willow	Golden willow	Green ash, silver maple, eastern cottonwood
Urban land.					
4088:					
Nevin	Silky dogwood	American cranberrybush, Amur honeysuckle, Amur privet	Washington hawthorn, blue spruce, eastern arborvitae, white fir	Austrian pine, Norway spruce	Pin oak, eastern white pine
Urban land.					
4133:					
Colo, occasionally flooded	---	American plum, redosier dogwood	Amur maple, white fir, white spruce, common hackberry, tall purple willow	Golden willow	Green ash, silver maple, eastern cottonwood
Urban land.					
4135:					
Coland, occasionally flooded	---	American plum, cotoneaster, redosier dogwood	Amur maple, eastern arborvitae, white spruce, common hackberry, tall purple willow	Golden willow	Green ash, silver maple, eastern cottonwood
Urban land.					

Table 9.--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
4152:					
Marshan, 24 to 40 inches to sand and gravel	Common ninebark, nannyberry, redosier dogwood, silky dogwood	American cranberrybush, eastern arborvitae	Balsam fir, white spruce	Green ash, red maple, silver maple, white ash	---
Urban land.					
4159:					
Finchford	Siberian peashrub, common lilac	Sargent crabapple, eastern redcedar	Russian olive, jack pine, red pine, Austrian pine, Siberian elm, green ash	Eastern white pine	---
Urban land.					
4159C:					
Finchford	Siberian peashrub, common lilac	Sargent crabapple, eastern redcedar	Russian olive, jack pine, red pine, Austrian pine, Siberian elm, green ash	Eastern white pine	---
Urban land.					
4171B:					
Bassett	---	Siberian peashrub, common lilac, gray dogwood, redosier dogwood	Eastern arborvitae, eastern redcedar, Amur maple, blue spruce	Russian olive, common hackberry, green ash, eastern white pine	---
Urban land.					
4171D:					
Bassett	---	Siberian peashrub, common lilac, gray dogwood, redosier dogwood	Eastern arborvitae, eastern redcedar, Amur maple, blue spruce	Russian olive, common hackberry, green ash, eastern white pine	---
Urban land.					

Table 9.--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
4175:					
Dickinson	Common lilac	Siberian peashrub, Russian olive, eastern redcedar	Amur maple, common hackberry, red pine, eastern white pine, green ash	Norway spruce, honeylocust	---
Urban land.					
4175B:					
Dickinson	Common lilac	Siberian peashrub, Russian olive, eastern redcedar	Amur maple, common hackberry, red pine, eastern white pine, green ash	Norway spruce, honeylocust	---
Urban land.					
4177:					
Saude	Siberian peashrub, common lilac	Manchurian crabapple, common hackberry, eastern redcedar	Russian olive, bur oak, green ash, eastern white pine, jack pine, honeylocust	---	---
Urban land.					
4177B:					
Saude	Siberian peashrub, common lilac	Manchurian crabapple, common hackberry, eastern redcedar	Russian olive, bur oak, green ash, eastern white pine, jack pine, honeylocust	---	---
Urban land.					
4178:					
Waukee	Siberian peashrub, common lilac	Manchurian crabapple, common hackberry, eastern redcedar	Russian olive, bur oak, green ash, eastern white pine, jack pine, honeylocust	---	---
Urban land.					

Table 9.--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
4184:					
Klinger	---	Common lilac, redosier dogwood	Eastern arborvitae, white spruce, Amur maple, blue spruce	Austrian pine, eastern white pine, common hackberry, green ash	Silver maple
Urban land.					
4198B:					
Floyd	---	Common lilac, redosier dogwood	Eastern arborvitae, white spruce, Amur maple, blue spruce	Austrian pine, eastern white pine, common hackberry, green ash	Silver maple
Urban land.					
4226:					
Lawler, 24 to 40 inches to sand and gravel	---	Common lilac, redosier dogwood	Eastern arborvitae, white spruce, Amur maple, blue spruce	Austrian pine, eastern white pine, common hackberry, green ash	Silver maple
Urban land.					
4284:					
Flagler	Siberian peashrub, common lilac	Manchurian crabapple, common hackberry, eastern redcedar	Russian olive, bur oak, green ash, eastern white pine, jack pine, honeylocust	---	---
Urban land.					
4284B:					
Flagler	Siberian peashrub, common lilac	Manchurian crabapple, common hackberry, eastern redcedar	Russian olive, bur oak, green ash, eastern white pine, jack pine, honeylocust	---	---
Urban land.					

Table 9.--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
4377B:					
Dinsdale	---	Siberian peashrub, common lilac, gray dogwood, redosier dogwood	Eastern arborvitae, eastern redcedar, Amur maple, blue spruce	Russian olive, common hackberry, green ash, eastern white pine	---
Urban land.					
4377C:					
Dinsdale	---	Siberian peashrub, common lilac, gray dogwood, redosier dogwood	Eastern arborvitae, eastern redcedar, Amur maple, blue spruce	Russian olive, common hackberry, green ash, eastern white pine	---
Urban land.					
4382:					
Maxfield	---	American plum, redosier dogwood	Amur maple, eastern arborvitae, white spruce, common hackberry, tall purple willow	Golden willow	Green ash, silver maple, eastern cottonwood
Urban land.					
4391B:					
Clyde	---	American plum, redosier dogwood	Amur maple, eastern arborvitae, white spruce, common hackberry, tall purple willow	Golden willow	Green ash, silver maple, eastern cottonwood
Floyd	---	Common lilac, redosier dogwood	Eastern arborvitae, white spruce, Amur maple, blue spruce	Austrian pine, eastern white pine, common hackberry, green ash	Silver maple
Urban land.					
4398:					
Tripoli	---	Siberian peashrub, common lilac, eastern arborvitae	Eastern redcedar, bur oak, white spruce, common hackberry	Green ash, golden willow, honeylocust	Eastern cottonwood
Urban land.					

Table 9.--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
4399:					
Readlyn	---	Common lilac, redosier dogwood	Eastern arborvitae, white spruce, Amur maple, blue spruce	Austrian pine, eastern white pine, common hackberry, green ash	Silver maple
Urban land.					
4408B:					
Olin	Common lilac	Siberian peashrub, cotoneaster, Russian olive, eastern redcedar	Amur maple, common hackberry, red pine, eastern white pine, green ash	Norway spruce, honeylocust	---
Urban land.					
4408C:					
Olin	Common lilac	Siberian peashrub, cotoneaster, Russian olive, eastern redcedar	Amur maple, common hackberry, red pine, eastern white pine, green ash	Norway spruce, honeylocust	---
Urban land.					
4426B, 4426C. Aredale-Urban land					
4585:					
Spillville, occasionally flooded	---	Common lilac, redosier dogwood	Eastern arborvitae, white spruce, Amur maple, blue spruce	Austrian pine, eastern white pine, common hackberry, green ash	Silver maple
Coland, occasionally flooded	---	American plum, cotoneaster, redosier dogwood	Amur maple, eastern arborvitae, white spruce, common hackberry, tall purple willow	Golden willow	Green ash, silver maple, eastern cottonwood
Urban land.					

Table 9.--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
4761:					
Franklin	---	Common lilac, redosier dogwood	Eastern arborvitae, white spruce, Amur maple, blue spruce	Austrian pine, eastern white pine, common hackberry, green ash	Silver maple
Urban land.					
4771B:					
Waubeek	---	Siberian peashrub, common lilac, gray dogwood, redosier dogwood	Eastern arborvitae, eastern redcedar, Amur maple, blue spruce	Russian olive, common hackberry, green ash, eastern white pine	---
Urban land.					
4771D:					
Waubeek	---	Siberian peashrub, common lilac, gray dogwood, redosier dogwood	Eastern arborvitae, eastern redcedar, Amur maple, blue spruce	Russian olive, common hackberry, green ash, eastern white pine	---
Urban land.					
4798:					
Protivin	Gray dogwood, silky dogwood	American plum, redosier dogwood	Amur maple, eastern redcedar	Norway spruce, common hackberry, red pine	Silver maple, eastern cottonwood
Urban land.					
4911B:					
Colo	---	American plum, redosier dogwood	Amur maple, white fir, white spruce, common hackberry, tall purple willow	Golden willow	Green ash, silver maple, eastern cottonwood
Ely	Silky dogwood	American cranberrybush, Amur honeysuckle, Amur privet	Washington hawthorn, blue spruce, eastern arborvitae, white fir	Austrian pine, Norway spruce	Pin oak, eastern white pine
Urban land.					

Table 9.--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
4933:					
Sawmill, occasionally flooded----------------	---	American plum, redosier dogwood	Amur maple, eastern arborvitae, white spruce, common hackberry, tall purple willow	Golden willow-------	Green ash, silver maple, eastern cottonwood
Urban land.					
4946. Orthents, loamy-Urban land					
5010. Pits, sand and gravel					
5030. Pits, limestone quarries					
5040. Orthents, loamy					
5053. Psammaquents, frequently flooded					
5080. Orthents, sanitary landfill					
AW. Animal waste					
SL. Sewage lagoon					
W. Water					

Table 10.--Forestland Productivity

(Only the soils that are commonly used as forestland are listed. See text for an explanation of terms used in this table)

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
41D:				
Sparta	Jack pine	57	86	Eastern white pine, jack pine, red pine
	Northern red oak	47	29	
	Red pine	---	---	
63B:				
Chelsea	Eastern white pine	83	186	Eastern white pine, jack pine, red pine
	Jack pine	70	100	
	Northern red oak	70	72	
	Quaking aspen	72	86	
	Red pine	72	129	
	White oak	70	72	
63C:				
Chelsea	Eastern white pine	83	186	Eastern white pine, jack pine, red pine
	Jack pine	70	100	
	Northern red oak	70	72	
	Quaking aspen	72	86	
	Red pine	72	129	
	White oak	70	72	
63D:				
Chelsea	Eastern white pine	83	186	Eastern white pine, jack pine, red pine
	Jack pine	70	100	
	Northern red oak	70	72	
	Quaking aspen	72	86	
	Red pine	72	129	
	White oak	70	72	
171B:				
Bassett	Northern red oak	55	43	Black walnut, eastern white pine, red pine, sugar maple
	White oak	55	43	
221:				
Klossner	Black ash	---	---	Eastern arborvitae, tamarack
	Eastern arborvitae	---	---	
	Quaking aspen	---	---	
	Red maple	55	29	
	Silver maple	80	29	
	Tamarack	---	---	
	White ash	---	---	
290:				
Dells	Northern red oak	---	---	Silver maple, white ash, white spruce
	Silver maple	80	29	
	White ash	---	---	
412C:				
Emeline	American elm	50	---	Bur oak, eastern redcedar, eastern white pine, jack pine, red pine
	Black oak	50	29	
	Bur oak	50	29	
	Eastern redcedar	50	57	
	Northern red oak	50	29	
	Shagbark hickory	50	---	

Table 10.--Forestland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
471:				
Oran	Northern red oak	55	43	Black walnut, eastern white pine, red pine, sugar maple
	White oak	55	43	
626:				
Hayfield	Eastern white pine	60	114	Black walnut, eastern white pine, northern red oak, red pine, silver maple, white ash, white oak, white spruce
	Northern red oak	65	57	
	White oak	65	57	
761:				
Franklin	Northern red oak	65	57	Black walnut, eastern white pine, northern red oak, sugar maple, white oak
	White oak	65	57	
771B:				
Waubeek	Northern red oak	65	57	Black walnut, eastern white pine, red pine, sugar maple
	White oak	65	57	
775B:				
Billett	Black oak	---	---	Norway spruce, eastern white pine, red pine, white spruce
	Northern pin oak	---	---	
	Northern red oak	60	57	
	Shagbark hickory	---	---	
	White oak	---	---	
776C:				
Lilah	Northern red oak	55	43	Eastern redcedar, eastern white pine, white oak
777:				
Wapsie	Northern red oak	55	43	Black walnut, eastern white pine, red pine, sugar maple
	White oak	55	43	
781B:				
Lourdes	Northern red oak	55	43	Black walnut, eastern white pine, red pine, sugar maple
	White oak	55	43	
781C2:				
Lourdes	Northern red oak	55	43	Black walnut, eastern white pine, red pine, sugar maple
	White oak	55	43	

Table 10.--Forestland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
782B:				
Donnan	Northern red oak	55	43	Black walnut, eastern white pine, red pine, silver maple
	White oak	55	43	
1285G:				
Burkhardt	Black oak	---	---	Norway spruce, eastern white pine, jack pine, red pine
	Jack pine	---	---	
	Northern pin oak	52	29	
Bassett.				
Chelsea.				
1586:				
Sigglekov	White oak	55	43	Eastern white pine
Fluvaquents.				
Aquents.				
4041D:				
Sparta	Jack pine	57	86	Eastern white pine, jack pine, red pine
	Northern red oak	47	29	
	Red pine	---	---	
Urban land.				
4063B:				
Chelsea	Eastern white pine	83	186	Eastern white pine, jack pine, red pine
	Jack pine	70	100	
	Northern red oak	70	72	
	Quaking aspen	72	86	
	Red pine	72	129	
	White oak	70	72	
Urban land.				
4063C:				
Chelsea	Eastern white pine	83	186	Eastern white pine, jack pine, red pine
	Jack pine	70	100	
	Northern red oak	70	72	
	Quaking aspen	72	86	
	Red pine	72	129	
	White oak	70	72	
Urban land.				
4063D:				
Chelsea	Eastern white pine	83	186	Eastern white pine, jack pine, red pine
	Jack pine	70	100	
	Northern red oak	70	72	
	Quaking aspen	72	86	
	Red pine	72	129	
	White oak	70	72	
Urban land.				

Table 10.--Forestland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
4171B:				
Bassett	Northern red oak	55	43	Black walnut, eastern white pine, red pine, sugar maple
	White oak	55	43	
Urban land.				
4171D:				
Bassett	Northern red oak	55	43	Black walnut, eastern white pine, red pine, sugar maple
	White oak	55	43	
Urban land.				
4761:				
Franklin	Northern red oak	65	57	Black walnut, eastern white pine, northern red oak, sugar maple, white oak
	White oak	65	57	
Urban land.				
4771B:				
Waubeek	Northern red oak	65	57	Black walnut, eastern white pine, red pine, sugar maple
	White oak	65	57	
Urban land.				
4771D:				
Waubeek	Northern red oak	65	57	Black walnut, eastern white pine, red pine, sugar maple
	White oak	65	57	
Urban land.				

Table 11a.--Recreational Development

(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. "Not rated" indicates that data are not available or that no rating is applicable. See text for further explanation of ratings in this table)

Map symbol and soil name	Camp areas		Picnic areas		Playgrounds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
7:						
Wiota	Not limited		Not limited		Not limited	
41:						
Sparta	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.95	Too sandy	0.95	Too sandy	0.95
41B:						
Sparta	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.95	Too sandy	0.95	Too sandy	0.95
					Slope	0.50
41C:						
Sparta	Somewhat limited		Somewhat limited		Very limited	
	Too sandy	0.95	Too sandy	0.95	Slope	1.00
					Too sandy	0.95
41D:						
Sparta	Somewhat limited		Somewhat limited		Very limited	
	Too sandy	0.95	Too sandy	0.95	Slope	1.00
	Slope	0.63	Slope	0.63	Too sandy	0.95
63B:						
Chelsea	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.95	Too sandy	0.95	Too sandy	0.95
					Slope	0.50
63C:						
Chelsea	Somewhat limited		Somewhat limited		Very limited	
	Too sandy	0.95	Too sandy	0.95	Slope	1.00
					Too sandy	0.95
63D:						
Chelsea	Somewhat limited		Somewhat limited		Very limited	
	Too sandy	0.95	Too sandy	0.95	Slope	1.00
	Slope	0.63	Slope	0.63	Too sandy	0.95
83B:						
Kenyon	Not limited		Not limited		Somewhat limited	
					Slope	0.50
83C:						
Kenyon	Not limited		Not limited		Very limited	
					Slope	1.00
83C2:						
Kenyon, moderately eroded	Not limited		Not limited		Very limited	
					Slope	1.00
83D2:						
Kenyon, moderately eroded	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.63	Slope	0.63	Slope	1.00

Table 11a.--Recreational Development--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
84:						
Clyde	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
88:						
Nevin	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				
133:						
Colo, occasionally flooded	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
135:						
Coland, occasionally flooded	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
159:						
Finchford	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.82	Too sandy	0.82	Too sandy	0.82
159C:						
Finchford	Somewhat limited		Somewhat limited		Very limited	
	Too sandy	0.82	Too sandy	0.82	Slope	1.00
					Too sandy	0.82
171B:						
Bassett	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.39	Depth to saturated zone	0.19	Slope	0.50
					Depth to saturated zone	0.39
175:						
Dickinson	Not limited		Not limited		Not limited	
175B:						
Dickinson	Not limited		Not limited		Somewhat limited	
					Slope	0.50
177:						
Saude	Not limited		Not limited		Not limited	
177B:						
Saude	Not limited		Not limited		Somewhat limited	
					Slope	0.50
178:						
Waukee	Not limited		Not limited		Not limited	
178B:						
Waukee	Not limited		Not limited		Somewhat limited	
					Slope	0.50

Table 11a.--Recreational Development--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
184:						
Klinger-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
198B:						
Floyd---------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
					Slope	0.12
213B:						
Rockton, 30 to 40 inches to limestone	Not limited		Not limited		Somewhat limited	
					Slope	0.50
					Depth to bedrock	0.10
221:						
Klossner------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
284:						
Flagler-------------	Not limited		Not limited		Not limited	
284B:						
Flagler-------------	Not limited		Not limited		Somewhat limited	
					Slope	0.50
290:						
Dells---------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
354:						
Aquolls, ponded-----	Not rated		Not rated		Not rated	
377B:						
Dinsdale------------	Not limited		Not limited		Somewhat limited	
					Slope	0.50
377C:						
Dinsdale------------	Not limited		Not limited		Very limited	
					Slope	1.00
377C2:						
Dinsdale, moderately eroded-------------	Not limited		Not limited		Very limited	
					Slope	1.00
382:						
Maxfield------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
391B:						
Clyde---------------	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 11a.--Recreational Development--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
391B:						
Floyd	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
					Slope	0.12
395B:						
Marquis	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.39	Depth to saturated zone	0.19	Slope	0.50
					Depth to saturated zone	0.39
398:						
Tripoli	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
399:						
Readlyn	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
408B:						
Olin	Not limited		Not limited		Somewhat limited	
					Slope	0.50
408C:						
Olin	Not limited		Not limited		Very limited	
					Slope	1.00
412C:						
Emeline	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
					Slope	1.00
					Content of large stones	0.01
426B:						
Aredale	Not limited		Not limited		Somewhat limited	
					Slope	0.50
426C:						
Aredale	Not limited		Not limited		Very limited	
					Slope	1.00
426C2:						
Aredale, moderately eroded	Not limited		Not limited		Very limited	
					Slope	1.00
468B:						
Dunkerton	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	0.15	Restricted permeability	0.15	Slope	0.50
					Restricted permeability	0.15

Table 11a.--Recreational Development--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
468C:						
Dunkerton	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	0.15	Restricted permeability	0.15	Slope	1.00
					Restricted permeability	0.15
471:						
Oran	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
485:						
Spillville, occasionally flooded	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
585:						
Spillville, occasionally flooded	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
Coland, occasionally flooded	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
626:						
Hayfield, 24 to 40 inches to sand and gravel	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
761:						
Franklin	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
771B:						
Waubeek	Not limited		Not limited		Somewhat limited	
					Slope	0.50
775B:						
Billett	Not limited		Not limited		Somewhat limited	
					Slope	0.50
776C:						
Lilah	Not limited		Not limited		Very limited	
					Slope	1.00

Table 11a.--Recreational Development--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
777:						
Wapsie	Not limited		Not limited		Not limited	
781B:						
Lourdes	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.15	Restricted permeability	0.15	Slope	0.50
					Restricted permeability	0.15
781C2:						
Lourdes, moderately eroded	Somewhat limited		Somewhat limited		Very limited	
	Restricted permeability	0.15	Restricted permeability	0.15	Slope	1.00
					Restricted permeability	0.15
782B:						
Donnan	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
798:						
Protivin	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	0.15	Restricted permeability	0.15	Restricted permeability	0.15
809B:						
Bertram	Not limited		Not limited		Somewhat limited	
					Slope	0.50
					Depth to bedrock	0.46
877B:						
Dinsmore	Not limited		Not limited		Somewhat limited	
					Slope	0.50
884:						
Klingmore	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
911B:						
Colo	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Ely	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
					Slope	0.50

Table 11a.--Recreational Development--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
933:						
Sawmill, occasionally flooded	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
982:						
Maxmore	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
1152:						
Marshan, 24 to 40 inches to sand and gravel	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
1226:						
Lawler, 24 to 40 inches to sand and gravel	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
1285G:						
Burkhardt	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
					Gravel content	0.08
Bassett	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Depth to saturated zone	0.39	Depth to saturated zone	0.19	Depth to saturated zone	0.39
Chelsea	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Too sandy	0.95	Too sandy	0.95	Too sandy	0.95
1585:						
Spillville, frequently flooded	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
Coland, frequently flooded	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
Aquolls, ponded	Not rated		Not rated		Not rated	

Table 11a.--Recreational Development--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
1586:						
Sigglekov, frequently flooded	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
Fluvaquents, frequently flooded	Not rated		Not rated		Not rated	
Aquents, ponded-----	Not rated		Not rated		Not rated	
4000:						
Urban land----------	Not rated		Not rated		Not rated	
4007:						
Wiota---------------	Not limited		Not limited		Not limited	
Urban land----------	Not rated		Not rated		Not rated	
4041:						
Sparta--------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.95	Too sandy	0.95	Too sandy	0.95
Urban land----------	Not rated		Not rated		Not rated	
4041B:						
Sparta--------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.95	Too sandy	0.95	Too sandy	0.95
					Slope	0.50
Urban land----------	Not rated		Not rated		Not rated	
4041C:						
Sparta--------------	Somewhat limited		Somewhat limited		Very limited	
	Too sandy	0.95	Too sandy	0.95	Slope	1.00
					Too sandy	0.95
Urban land----------	Not rated		Not rated		Not rated	
4041D:						
Sparta--------------	Somewhat limited		Somewhat limited		Very limited	
	Too sandy	0.95	Too sandy	0.95	Slope	1.00
	Slope	0.63	Slope	0.63	Too sandy	0.95
Urban land----------	Not rated		Not rated		Not rated	
4063B:						
Chelsea-------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.95	Too sandy	0.95	Too sandy	0.95
					Slope	0.50
Urban land----------	Not rated		Not rated		Not rated	
4063C:						
Chelsea-------------	Somewhat limited		Somewhat limited		Very limited	
	Too sandy	0.95	Too sandy	0.95	Slope	1.00
					Too sandy	0.95
Urban land----------	Not rated		Not rated		Not rated	

Table 11a.--Recreational Development--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
4063D:						
Chelsea	Somewhat limited		Somewhat limited		Very limited	
	Too sandy	0.95	Too sandy	0.95	Slope	1.00
	Slope	0.63	Slope	0.63	Too sandy	0.95
Urban land	Not rated		Not rated		Not rated	
4083B:						
Kenyon	Not limited		Not limited		Somewhat limited	
					Slope	0.50
Urban land	Not rated		Not rated		Not rated	
4083C:						
Kenyon	Not limited		Not limited		Very limited	
					Slope	1.00
Urban land	Not rated		Not rated		Not rated	
4083D:						
Kenyon	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.63	Slope	0.63	Slope	1.00
Urban land	Not rated		Not rated		Not rated	
4084:						
Clyde	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Urban land	Not rated		Not rated		Not rated	
4088:						
Nevin	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				
Urban land	Not rated		Not rated		Not rated	
4133:						
Colo, occasionally flooded	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
Urban land	Not rated		Not rated		Not rated	
4135:						
Coland, occasionally flooded	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
Urban land	Not rated		Not rated		Not rated	

Table 11a.--Recreational Development--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
4152:						
Marshan, 24 to 40 inches to sand and gravel	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Urban land	Not rated		Not rated		Not rated	
4159:						
Finchford	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.82	Too sandy	0.82	Too sandy	0.82
Urban land	Not rated		Not rated		Not rated	
4159C:						
Finchford	Somewhat limited		Somewhat limited		Very limited	
	Too sandy	0.82	Too sandy	0.82	Slope	1.00
					Too sandy	0.82
Urban land	Not rated		Not rated		Not rated	
4171B:						
Bassett	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.39	Depth to saturated zone	0.19	Slope	0.50
					Depth to saturated zone	0.39
Urban land	Not rated		Not rated		Not rated	
4171D:						
Bassett	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.63	Slope	0.63	Slope	1.00
	Depth to saturated zone	0.39	Depth to saturated zone	0.19	Depth to saturated zone	0.39
Urban land	Not rated		Not rated		Not rated	
4175:						
Dickinson	Not limited		Not limited		Not limited	
Urban land	Not rated		Not rated		Not rated	
4175B:						
Dickinson	Not limited		Not limited		Somewhat limited	
					Slope	0.50
Urban land	Not rated		Not rated		Not rated	
4177:						
Saude	Not limited		Not limited		Not limited	
Urban land	Not rated		Not rated		Not rated	
4177B:						
Saude	Not limited		Not limited		Somewhat limited	
					Slope	0.50
Urban land	Not rated		Not rated		Not rated	

Table 11a.--Recreational Development--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
4178:						
Waukee	Not limited		Not limited		Not limited	
Urban land	Not rated		Not rated		Not rated	
4184:						
Klinger	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Urban land	Not rated		Not rated		Not rated	
4198B:						
Floyd	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
					Slope	0.12
Urban land	Not rated		Not rated		Not rated	
4226:						
Lawler, 24 to 40 inches to sand and gravel	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Urban land	Not rated		Not rated		Not rated	
4284:						
Flagler	Not limited		Not limited		Not limited	
Urban land	Not rated		Not rated		Not rated	
4284B:						
Flagler	Not limited		Not limited		Somewhat limited	
					Slope	0.50
Urban land	Not rated		Not rated		Not rated	
4377B:						
Dinsdale	Not limited		Not limited		Somewhat limited	
					Slope	0.50
Urban land	Not rated		Not rated		Not rated	
4377C:						
Dinsdale	Not limited		Not limited		Very limited	
					Slope	1.00
Urban land	Not rated		Not rated		Not rated	
4382:						
Maxfield	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Urban land	Not rated		Not rated		Not rated	

Table 11a.--Recreational Development--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
4391B:						
Clyde	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Floyd	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
					Slope	0.12
Urban land	Not rated		Not rated		Not rated	
4398:						
Tripoli	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Urban land	Not rated		Not rated		Not rated	
4399:						
Readlyn	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Urban land	Not rated		Not rated		Not rated	
4408B:						
Olin	Not limited		Not limited		Somewhat limited	
					Slope	0.50
Urban land	Not rated		Not rated		Not rated	
4408C:						
Olin	Not limited		Not limited		Very limited	
					Slope	1.00
Urban land	Not rated		Not rated		Not rated	
4426B:						
Aredale	Not limited		Not limited		Somewhat limited	
					Slope	0.50
Urban land	Not rated		Not rated		Not rated	
4426C:						
Aredale	Not limited		Not limited		Very limited	
					Slope	1.00
Urban land	Not rated		Not rated		Not rated	
4585:						
Spillville, occasionally flooded	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

Table 11a.--Recreational Development--Continued

Map symbol and soil name	Camp areas		Picnic areas		Playgrounds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4585:						
Coland, occasionally flooded	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
Urban land	Not rated		Not rated		Not rated	
4761:						
Franklin	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Urban land	Not rated		Not rated		Not rated	
4771B:						
Waubeek	Not limited		Not limited		Somewhat limited	
					Slope	0.50
Urban land	Not rated		Not rated		Not rated	
4771D:						
Waubeek	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.04	Slope	0.04	Slope	1.00
Urban land	Not rated		Not rated		Not rated	
4798:						
Protivin	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	0.15	Restricted permeability	0.15	Restricted permeability	0.15
Urban land	Not rated		Not rated		Not rated	
4911B:						
Colo	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
Ely	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
					Slope	0.50
Urban land	Not rated		Not rated		Not rated	
4933:						
Sawmill, occasionally flooded	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
Urban land	Not rated		Not rated		Not rated	

Table 11a.--Recreational Development--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
4946:						
Orthents, loamy-----	Not rated		Not rated		Not rated	
Urban land----------	Not rated		Not rated		Not rated	
5010:						
Pits, sand and gravel------------	Not rated		Not rated		Not rated	
5030:						
Pits, limestone quarries-----------	Not rated		Not rated		Not rated	
5040:						
Orthents, loamy-----	Not rated		Not rated		Not rated	
5053:						
Psammaquents, frequently flooded	Not rated		Not rated		Not rated	
5080:						
Orthents, sanitary landfill-----------	Not rated		Not rated		Not rated	
AW:						
Animal waste--------	Not rated		Not rated		Not rated	
SL:						
Sewage lagoon-------	Not rated		Not rated		Not rated	
W:						
Water---------------	Not rated		Not rated		Not rated	

Table 11b.--Recreational Development

(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. "Not rated" indicates that data are not available or that no rating is applicable. See text 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
7:						
Wiota	Not limited		Not limited		Not limited	
41:						
Sparta	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.95	Too sandy	0.95	Droughty	0.12
41B:						
Sparta	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.95	Too sandy	0.95	Droughty	0.12
41C:						
Sparta	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.95	Too sandy	0.95	Droughty	0.15
41D:						
Sparta	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.95	Too sandy	0.95	Slope	0.63
					Droughty	0.17
63B:						
Chelsea	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.95	Too sandy	0.95	Droughty	0.28
63C:						
Chelsea	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.95	Too sandy	0.95	Droughty	0.28
63D:						
Chelsea	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.95	Too sandy	0.95	Slope	0.63
					Droughty	0.28
83B:						
Kenyon	Not limited		Not limited		Not limited	
83C:						
Kenyon	Not limited		Not limited		Not limited	
83C2:						
Kenyon, moderately eroded	Not limited		Not limited		Not limited	
83D2:						
Kenyon, moderately eroded	Somewhat limited		Somewhat limited		Somewhat limited	
	Water erosion	0.27	Water erosion	0.27	Slope	0.63
84:						
Clyde	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 11b.--Recreational Development--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
88:						
Nevin	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
133:						
Colo, occasionally flooded	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
135:						
Coland, occasionally flooded	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
159:						
Finchford	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.82	Too sandy	0.82	Droughty	0.60
159C:						
Finchford	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.82	Too sandy	0.82	Droughty	0.80
171B:						
Bassett	Not limited		Not limited		Somewhat limited	
					Depth to saturated zone	0.19
175:						
Dickinson	Not limited		Not limited		Not limited	
175B:						
Dickinson	Not limited		Not limited		Not limited	
177:						
Saude	Not limited		Not limited		Not limited	
177B:						
Saude	Not limited		Not limited		Not limited	
178:						
Waukee	Not limited		Not limited		Not limited	
178B:						
Waukee	Not limited		Not limited		Not limited	
184:						
Klinger	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
198B:						
Floyd	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 11b.--Recreational Development--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
213B:						
Rockton, 30 to 40 inches to limestone	Not limited		Not limited		Somewhat limited	
					Depth to bedrock	0.10
221:						
Klossner------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
284:						
Flagler-------------	Not limited		Not limited		Not limited	
284B:						
Flagler-------------	Not limited		Not limited		Not limited	
290:						
Dells---------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
354:						
Aquolls, ponded-----	Not rated		Not rated		Not rated	
377B:						
Dinsdale------------	Not limited		Not limited		Not limited	
377C:						
Dinsdale------------	Not limited		Not limited		Not limited	
377C2:						
Dinsdale, moderately eroded------------	Not limited		Not limited		Not limited	
382:						
Maxfield------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
391B:						
Clyde---------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Floyd---------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
395B:						
Marquis-------------	Not limited		Not limited		Somewhat limited	
					Depth to saturated zone	0.19
398:						
Tripoli-------------	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 11b.--Recreational Development--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
399:						
Readlyn-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
408B:						
Olin----------------	Not limited		Not limited		Not limited	
408C:						
Olin----------------	Not limited		Not limited		Not limited	
412C:						
Emeline-------------	Not limited		Not limited		Very limited	
					Depth to bedrock	1.00
					Droughty	1.00
					Content of large stones	0.01
426B:						
Aredale-------------	Not limited		Not limited		Not limited	
426C:						
Aredale-------------	Not limited		Not limited		Not limited	
426C2:						
Aredale, moderately eroded------------	Not limited		Not limited		Not limited	
468B:						
Dunkerton-----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
468C:						
Dunkerton-----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
471:						
Oran----------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
485:						
Spillville, occasionally flooded-----------	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
585:						
Spillville, occasionally flooded-----------	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

Table 11b.--Recreational Development--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
585:						
Coland, occasionally flooded	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
626:						
Hayfield, 24 to 40 inches to sand and gravel	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
761:						
Franklin	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
771B:						
Waubeek	Not limited		Not limited		Not limited	
775B:						
Billett	Not limited		Not limited		Not limited	
776C:						
Lilah	Not limited		Not limited		Somewhat limited	
					Droughty	0.89
777:						
Wapsie	Not limited		Not limited		Not limited	
781B:						
Lourdes	Not limited		Not limited		Not limited	
781C2:						
Lourdes, moderately eroded	Not limited		Not limited		Not limited	
782B:						
Donnan	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
798:						
Protivin	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
809B:						
Bertram	Not limited		Not limited		Somewhat limited	
					Depth to bedrock	0.46
					Droughty	0.02
877B:						
Dinsmore	Not limited		Not limited		Not limited	
884:						
Klingmore	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 11b.--Recreational Development--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
911B:						
Colo	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Ely	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
933:						
Sawmill, occasionally flooded	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
982:						
Maxmore	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
1152:						
Marshan, 24 to 40 inches to sand and gravel	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
1226:						
Lawler, 24 to 40 inches to sand and gravel	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
1285G:						
Burkhardt	Very limited		Somewhat limited		Very limited	
	Slope	1.00	Slope	0.22	Slope	1.00
	Water erosion	0.01	Water erosion	0.01	Droughty	0.14
Bassett	Very limited		Somewhat limited		Very limited	
	Slope	1.00	Water erosion	0.53	Slope	1.00
	Water erosion	0.53	Slope	0.22	Depth to saturated zone	0.19
Chelsea	Very limited		Somewhat limited		Very limited	
	Slope	1.00	Too sandy	0.95	Slope	1.00
	Too sandy	0.95	Slope	0.22	Droughty	0.48
1585:						
Spillville, frequently flooded	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 11b.--Recreational Development--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
1585:						
Coland, frequently flooded	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
Aquolls, ponded	Not rated		Not rated		Not rated	
1586:						
Sigglekov, frequently flooded	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
					Droughty	0.98
Fluvaquents, frequently flooded	Not rated		Not rated		Not rated	
Aquents, ponded	Not rated		Not rated		Not rated	
4000:						
Urban land	Not rated		Not rated		Not rated	
4007:						
Wiota	Not limited		Not limited		Not limited	
Urban land	Not rated		Not rated		Not rated	
4041:						
Sparta	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.95	Too sandy	0.95	Droughty	0.12
Urban land	Not rated		Not rated		Not rated	
4041B:						
Sparta	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.95	Too sandy	0.95	Droughty	0.12
Urban land	Not rated		Not rated		Not rated	
4041C:						
Sparta	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.95	Too sandy	0.95	Droughty	0.15
Urban land	Not rated		Not rated		Not rated	
4041D:						
Sparta	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.95	Too sandy	0.95	Slope	0.63
					Droughty	0.17
Urban land	Not rated		Not rated		Not rated	
4063B:						
Chelsea	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.95	Too sandy	0.95	Droughty	0.28
Urban land	Not rated		Not rated		Not rated	

Table 11b.--Recreational Development--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
4063C:						
Chelsea-------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.95	Too sandy	0.95	Droughty	0.28
Urban land----------	Not rated		Not rated		Not rated	
4063D:						
Chelsea-------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.95	Too sandy	0.95	Slope	0.63
					Droughty	0.28
Urban land----------	Not rated		Not rated		Not rated	
4083B:						
Kenyon--------------	Not limited		Not limited		Not limited	
Urban land----------	Not rated		Not rated		Not rated	
4083C:						
Kenyon--------------	Not limited		Not limited		Not limited	
Urban land----------	Not rated		Not rated		Not rated	
4083D:						
Kenyon--------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Water erosion	0.27	Water erosion	0.27	Slope	0.63
Urban land----------	Not rated		Not rated		Not rated	
4084:						
Clyde---------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Urban land----------	Not rated		Not rated		Not rated	
4088:						
Nevin---------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Urban land----------	Not rated		Not rated		Not rated	
4133:						
Colo, occasionally flooded-----------	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
Urban land----------	Not rated		Not rated		Not rated	
4135:						
Coland, occasionally flooded-----------	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
Urban land----------	Not rated		Not rated		Not rated	

Table 11b.--Recreational Development--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
4152:						
Marshan, 24 to 40 inches to sand and gravel	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Urban land	Not rated		Not rated		Not rated	
4159:						
Finchford	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.82	Too sandy	0.82	Droughty	0.60
Urban land	Not rated		Not rated		Not rated	
4159C:						
Finchford	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.82	Too sandy	0.82	Droughty	0.80
Urban land	Not rated		Not rated		Not rated	
4171B:						
Bassett	Not limited		Not limited		Somewhat limited	
					Depth to saturated zone	0.19
Urban land	Not rated		Not rated		Not rated	
4171D:						
Bassett	Somewhat limited		Somewhat limited		Somewhat limited	
	Water erosion	0.53	Water erosion	0.53	Slope	0.63
					Depth to saturated zone	0.19
Urban land	Not rated		Not rated		Not rated	
4175:						
Dickinson	Not limited		Not limited		Not limited	
Urban land	Not rated		Not rated		Not rated	
4175B:						
Dickinson	Not limited		Not limited		Not limited	
Urban land	Not rated		Not rated		Not rated	
4177:						
Saude	Not limited		Not limited		Not limited	
Urban land	Not rated		Not rated		Not rated	
4177B:						
Saude	Not limited		Not limited		Not limited	
Urban land	Not rated		Not rated		Not rated	
4178:						
Waukee	Not limited		Not limited		Not limited	
Urban land	Not rated		Not rated		Not rated	

Table 11b.--Recreational Development--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
4184:						
Klinger	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Urban land	Not rated		Not rated		Not rated	
4198B:						
Floyd	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Urban land	Not rated		Not rated		Not rated	
4226:						
Lawler, 24 to 40 inches to sand and gravel	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Urban land	Not rated		Not rated		Not rated	
4284:						
Flagler	Not limited		Not limited		Not limited	
Urban land	Not rated		Not rated		Not rated	
4284B:						
Flagler	Not limited		Not limited		Not limited	
Urban land	Not rated		Not rated		Not rated	
4377B:						
Dinsdale	Not limited		Not limited		Not limited	
Urban land	Not rated		Not rated		Not rated	
4377C:						
Dinsdale	Not limited		Not limited		Not limited	
Urban land	Not rated		Not rated		Not rated	
4382:						
Maxfield	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Urban land	Not rated		Not rated		Not rated	
4391B:						
Clyde	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Floyd	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Urban land	Not rated		Not rated		Not rated	

Table 11b.--Recreational Development--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
4398:						
Tripoli	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Urban land	Not rated		Not rated		Not rated	
4399:						
Readlyn	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Urban land	Not rated		Not rated		Not rated	
4408B:						
Olin	Not limited		Not limited		Not limited	
Urban land	Not rated		Not rated		Not rated	
4408C:						
Olin	Not limited		Not limited		Not limited	
Urban land	Not rated		Not rated		Not rated	
4426B:						
Aredale	Not limited		Not limited		Not limited	
Urban land	Not rated		Not rated		Not rated	
4426C:						
Aredale	Not limited		Not limited		Not limited	
Urban land	Not rated		Not rated		Not rated	
4585:						
Spillville, occasionally flooded	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
Coland, occasionally flooded	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
Urban land	Not rated		Not rated		Not rated	
4761:						
Franklin	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Urban land	Not rated		Not rated		Not rated	
4771B:						
Waubeek	Not limited		Not limited		Not limited	
Urban land	Not rated		Not rated		Not rated	

Table 11b.--Recreational Development--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
4771D:						
Waubeek	Somewhat limited		Somewhat limited		Somewhat limited	
	Water erosion	0.53	Water erosion	0.53	Slope	0.04
Urban land	Not rated		Not rated		Not rated	
4798:						
Protivin	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Urban land	Not rated		Not rated		Not rated	
4911B:						
Colo	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
Ely	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Urban land	Not rated		Not rated		Not rated	
4933:						
Sawmill, occasionally flooded	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
Urban land	Not rated		Not rated		Not rated	
4946:						
Orthents, loamy	Not rated		Not rated		Not rated	
Urban land	Not rated		Not rated		Not rated	
5010:						
Pits, sand and gravel	Not rated		Not rated		Not rated	
5030:						
Pits, limestone quarries	Not rated		Not rated		Not rated	
5040:						
Orthents, loamy	Not rated		Not rated		Not rated	
5053:						
Psammaquents, frequently flooded	Not rated		Not rated		Not rated	
5080:						
Orthents, sanitary landfill	Not rated		Not rated		Not rated	
AW:						
Animal waste	Not rated		Not rated		Not rated	

Table 11b.--Recreational Development--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
SL:						
Sewage lagoon-------	Not rated		Not rated		Not rated	
W:						
Water---------------	Not rated		Not rated		Not rated	

Table 12.--Wildlife Habitat

(See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
7: Wiota	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
41: Sparta	Fair	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor
41B: Sparta	Fair	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor
41C: Sparta	Poor	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor
41D: Sparta	Poor	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor
63B: Chelsea	Poor	Fair	Fair	Poor	Poor	Very poor	Very poor	Fair	Poor	Very poor
63C: Chelsea	Poor	Fair	Fair	Poor	Poor	Very poor	Very poor	Fair	Poor	Very poor
63D: Chelsea	Very poor	Fair	Fair	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor
83B: Kenyon	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
83C: Kenyon	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
83C2: Kenyon, moderately eroded	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
83D2: Kenyon, moderately eroded	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
84: Clyde	Good	Good	Good	Fair	Poor	Good	Good	Good	Fair	Good
88: Nevin	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
133: Colo, occasionally flooded	Good	Fair	Good	Fair	Poor	Good	Good	Fair	Fair	Good
135: Coland, occasionally flooded	Good	Good	Good	Fair	Fair	Good	Good	Good	Fair	Good

Table 12.--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
159:										
Finchford	Poor	Poor	Fair	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor
159C:										
Finchford	Poor	Poor	Fair	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor
171B:										
Bassett	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
175:										
Dickinson	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
175B:										
Dickinson	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
177:										
Saude	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
177B:										
Saude	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
178:										
Waukee	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
178B:										
Waukee	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
184:										
Klinger	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
198B:										
Floyd	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
213B:										
Rockton, 30 to 40 inches to limestone	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
221:										
Klossner	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good
284:										
Flagler	Fair	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor
284B:										
Flagler	Fair	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor
290:										
Dells	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair

Table 12.--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
354. Aquolls, ponded										
377B: Dinsdale	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
377C: Dinsdale	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
377C2: Dinsdale, moderately eroded	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
382: Maxfield	Good	Good	Good	Fair	Poor	Good	Good	Good	Fair	Good
391B: Clyde	Good	Good	Good	Fair	Poor	Good	Good	Good	Fair	Good
Floyd	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
395B: Marquis	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
398: Tripoli	Good	Good	Good	Fair	Poor	Good	Good	Good	Fair	Good
399: Readlyn	Good	Good	Good	Fair	Fair	Fair	Fair	Good	Fair	Fair
408B: Olin	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
408C: Olin	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
412C: Emeline	Very poor	Very poor	Poor	Fair	Fair	Very poor	Very poor	Very poor	Fair	Very poor
426B: Aredale	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
426C: Aredale	Fair	Good	Good	Good	Good	Very poor	Poor	Good	Good	Poor
426C2: Aredale, moderately eroded	Fair	Good	Good	Good	Good	Very poor	Poor	Good	Good	Poor
468B: Dunkerton	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
468C: Dunkerton	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor

Table 12.--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
471:										
Oran	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
485:										
Spillville, occasionally flooded	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
585:										
Spillville, occasionally flooded	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
Coland, occasionally flooded	Good	Good	Good	Fair	Fair	Good	Good	Good	Fair	Good
626:										
Hayfield, 24 to 40 inches to sand and gravel	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
761:										
Franklin	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
771B:										
Waubeek	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
775B:										
Billett	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
776C:										
Lilah	Poor	Fair	Fair	Fair	Fair	Very poor	Very poor	Poor	Fair	Very poor
777:										
Wapsie	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
781B:										
Lourdes	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
781C2:										
Lourdes, moderately eroded	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
782B:										
Donnan	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
798:										
Protivin	Good	Fair	Good	Fair	Fair	Good	Good	Fair	Fair	Good
809B:										
Bertram	Fair	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor
877B:										
Dinsmore	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
884:										
Klingmore	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair

Table 12.--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
911B:										
Colo	Good	Fair	Good	Fair	Poor	Good	Good	Fair	Fair	Good
Ely	Good	Good	Good	Good	Good	Fair	Very poor	Good	Good	Poor
933:										
Sawmill, occasionally flooded	Good	Good	Good	Fair	Fair	Good	Fair	Good	Fair	Fair
982:										
Maxmore	Good	Good	Good	Fair	Poor	Good	Good	Good	Fair	Good
1152:										
Marshan, 24 to 40 inches to sand and gravel	Good	Good	Good	Fair	Poor	Good	Good	Good	Fair	Good
1226:										
Lawler, 24 to 40 inches to sand and gravel	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
1285G:										
Burkhardt	Poor	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor
Bassett.										
Chelsea.										
1585:										
Spillville, frequently flooded	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
Coland, frequently flooded	Poor	Fair	Fair	Poor	Poor	Good	Good	Poor	Poor	Good
Aquolls, ponded.										
1586:										
Sigglekov, frequently flooded	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Fair	Poor	Very poor
Fluvaquents, frequently flooded.										
Aquents, ponded.										
4000.										
Urban land										
4007:										
Wiota	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
Urban land.										
4041:										
Sparta	Fair	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor
Urban land.										

Table 12.--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
4041B:										
Sparta	Fair	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor
Urban land.										
4041C:										
Sparta	Poor	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor
Urban land.										
4041D:										
Sparta	Poor	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor
Urban land.										
4063B:										
Chelsea	Poor	Fair	Fair	Poor	Poor	Very poor	Very poor	Fair	Poor	Very poor
Urban land.										
4063C:										
Chelsea	Poor	Fair	Fair	Poor	Poor	Very poor	Very poor	Fair	Poor	Very poor
Urban land.										
4063D:										
Chelsea	Very poor	Fair	Fair	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor
Urban land.										
4083B:										
Kenyon	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
Urban land.										
4083C:										
Kenyon	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
Urban land.										
4083D:										
Kenyon	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
Urban land.										
4084:										
Clyde	Good	Good	Good	Fair	Poor	Good	Good	Good	Fair	Good
Urban land.										
4088:										
Nevin	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
Urban land.										

Table 12.--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
4133:										
Colo, occasionally flooded	Good	Fair	Good	Fair	Poor	Good	Good	Fair	Fair	Good
Urban land.										
4135:										
Coland, occasionally flooded	Good	Good	Good	Fair	Fair	Good	Good	Good	Fair	Good
Urban land.										
4152:										
Marshan, 24 to 40 inches to sand and gravel	Good	Good	Good	Fair	Poor	Good	Good	Good	Fair	Good
Urban land.										
4159:										
Finchford	Poor	Poor	Fair	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor
Urban land.										
4159C:										
Finchford	Poor	Poor	Fair	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor
Urban land.										
4171B:										
Bassett	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
Urban land.										
4171D:										
Bassett	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
Urban land.										
4175:										
Dickinson	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
Urban land.										
4175B:										
Dickinson	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
Urban land.										
4177:										
Saude	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
Urban land.										
4177B:										
Saude	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor

Table 12.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Conif- erous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Open- land wild- life	Wood- land wild- life	Wetland wild- life
4177B:										
Urban land.										
4178:										
Waukee	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
Urban land.										
4184:										
Klinger	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
Urban land.										
4198B:										
Floyd	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Urban land.										
4226:										
Lawler, 24 to 40 inches to sand and gravel	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
Urban land.										
4284:										
Flagler	Fair	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor
Urban land.										
4284B:										
Flagler	Fair	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor
Urban land.										
4377B:										
Dinsdale	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
Urban land.										
4377C:										
Dinsdale	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
Urban land.										
4382:										
Maxfield	Good	Good	Good	Fair	Poor	Good	Good	Good	Fair	Good
Urban land.										
4391B:										
Clyde	Good	Good	Good	Fair	Poor	Good	Good	Good	Fair	Good
Floyd	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Urban land.										

Table 12.--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
4398:										
Tripoli	Good	Good	Good	Fair	Poor	Good	Good	Good	Fair	Good
Urban land.										
4399:										
Readlyn	Good	Good	Good	Fair	Fair	Fair	Fair	Good	Fair	Fair
Urban land.										
4408B:										
Olin	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
Urban land.										
4408C:										
Olin	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
Urban land.										
4426B:										
Aredale	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
Urban land.										
4426C:										
Aredale	Fair	Good	Good	Good	Good	Very poor	Poor	Good	Good	Poor
Urban land.										
4585:										
Spillville, occasionally flooded	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
Coland, occasionally flooded	Good	Good	Good	Fair	Fair	Good	Good	Good	Fair	Good
Urban land.										
4761:										
Franklin	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
Urban land.										
4771B:										
Waubeek	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
Urban land.										
4771D:										
Waubeek	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
Urban land.										
4798:										
Protivin	Good	Fair	Good	Fair	Fair	Good	Good	Fair	Fair	Good
Urban land.										

Table 12.--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
4911B:										
Colo	Good	Fair	Good	Fair	Poor	Good	Good	Fair	Fair	Good
Ely	Good	Good	Good	Good	Good	Fair	Very poor	Good	Good	Poor
Urban land.										
4933:										
Sawmill, occasionally flooded	Good	Good	Good	Fair	Fair	Good	Fair	Good	Fair	Fair
Urban land.										
4946:										
Orthents, loamy.										
Urban land.										
5010. Pits, sand and gravel										
5030. Pits, limestone quarries										
5040. Orthents, loamy										
5053. Psammaquents, frequently flooded										
5080. Orthents, sanitary landfill										
AW. Animal waste										
SL. Sewage lagoon										
W. Water										

Table 13a.--Building Site Development

(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. "Not rated" indicates that data are not available or that no rating is applicable. See text for further explanation of ratings in this table)

Map symbol and soil name	Dwellings without basements		Dwellings with basements		Small commercial buildings	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
7:						
Wiota	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.06	Shrink-swell	0.32	Shrink-swell	0.06
41:						
Sparta	Not limited		Not limited		Not limited	
41B:						
Sparta	Not limited		Not limited		Not limited	
41C:						
Sparta	Not limited		Not limited		Somewhat limited	
					Slope	0.88
41D:						
Sparta	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.63	Slope	0.63	Slope	1.00
63B:						
Chelsea	Not limited		Not limited		Not limited	
63C:						
Chelsea	Not limited		Not limited		Somewhat limited	
					Slope	0.88
63D:						
Chelsea	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.63	Slope	0.63	Slope	1.00
83B:						
Kenyon	Not limited		Somewhat limited		Not limited	
			Depth to saturated zone	0.61		
83C:						
Kenyon	Not limited		Somewhat limited		Somewhat limited	
			Depth to saturated zone	0.61	Slope	0.88
83C2:						
Kenyon, moderately eroded	Not limited		Somewhat limited		Somewhat limited	
			Depth to saturated zone	0.61	Slope	0.88
83D2:						
Kenyon, moderately eroded	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.63	Slope	0.63	Slope	1.00
			Depth to saturated zone	0.61		

Table 13a.--Building Site Development--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
84:						
Clyde	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	0.18	Shrink-swell	0.18	Shrink-swell	0.18
88:						
Nevin	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	0.06	Shrink-swell	0.68	Shrink-swell	0.06
133:						
Colo, occasionally flooded	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
135:						
Coland, occasionally flooded	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
159:						
Finchford	Not limited		Not limited		Not limited	
159C:						
Finchford	Not limited		Not limited		Somewhat limited	
					Slope	0.50
171B:						
Bassett	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.39	Depth to saturated zone	1.00	Depth to saturated zone	0.39
175:						
Dickinson	Not limited		Not limited		Not limited	
175B:						
Dickinson	Not limited		Not limited		Not limited	
177:						
Saude	Not limited		Not limited		Not limited	
177B:						
Saude	Not limited		Not limited		Not limited	
178:						
Waukee	Not limited		Not limited		Not limited	
178B:						
Waukee	Not limited		Not limited		Not limited	

Table 13a.--Building Site Development--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
184:						
Klinger------------	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	0.32			Shrink-swell	0.32
198B:						
Floyd---------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
213B:						
Rockton, 30 to 40 inches to limestone	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.32	Depth to hard bedrock	1.00	Shrink-swell	0.32
	Depth to hard bedrock	0.10	Shrink-swell	0.32	Depth to hard bedrock	0.10
221:						
Klossner-----------	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
	Content of organic matter	1.00	Shrink-swell	0.32	Content of organic matter	1.00
284:						
Flagler------------	Not limited		Not limited		Not limited	
284B:						
Flagler------------	Not limited		Not limited		Not limited	
290:						
Dells---------------	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	0.18			Shrink-swell	0.18
354:						
Aquolls, ponded-----	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
377B:						
Dinsdale-----------	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.68	Depth to saturated zone	0.61	Shrink-swell	0.68
377C:						
Dinsdale-----------	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.68	Depth to saturated zone	0.61	Slope	0.88
					Shrink-swell	0.68
377C2:						
Dinsdale, moderately eroded------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.68	Depth to saturated zone	0.61	Slope	0.88
					Shrink-swell	0.68

Table 13a.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements		Dwellings with basements		Small commercial buildings	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
382:						
Maxfield------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
391B:						
Clyde---------------	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	0.18	Shrink-swell	0.18	Shrink-swell	0.18
Floyd---------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
395B:						
Marquis-------------	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.39	Depth to saturated zone	1.00	Depth to saturated zone	0.39
398:						
Tripoli-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
399:						
Readlyn-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
408B:						
Olin----------------	Not limited		Not limited		Not limited	
408C:						
Olin----------------	Not limited		Not limited		Somewhat limited	
					Slope	0.88
412C:						
Emeline-------------	Very limited		Very limited		Very limited	
	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
					Slope	0.50
426B:						
Aredale-------------	Not limited		Not limited		Not limited	
426C:						
Aredale-------------	Not limited		Not limited		Somewhat limited	
					Slope	0.88
426C2:						
Aredale, moderately eroded------------	Not limited		Not limited		Somewhat limited	
					Slope	0.88
468B:						
Dunkerton-----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.06	Shrink-swell	0.06	Shrink-swell	0.06

Table 13a.--Building Site Development--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
468C:						
Dunkerton-----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.06	Shrink-swell	0.06	Slope	0.88
					Shrink-swell	0.06
471:						
Oran----------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
485:						
Spillville, occasionally flooded-----------	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
585:						
Spillville, occasionally flooded-----------	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
Coland, occasionally flooded-----------	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
626:						
Hayfield, 24 to 40 inches to sand and gravel------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
761:						
Franklin------------	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	0.68			Shrink-swell	0.68
771B:						
Waubeek-------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.18	Depth to saturated zone	0.61	Shrink-swell	0.18
775B:						
Billett-------------	Not limited		Not limited		Not limited	
776C:						
Lilah---------------	Not limited		Not limited		Somewhat limited	
					Slope	0.50

Table 13a.--Building Site Development--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
777:						
Wapsie----------------	Not limited		Not limited		Not limited	
781B:						
Lourdes---------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.32	Depth to saturated zone	0.61	Shrink-swell	0.32
			Shrink-swell	0.32		
781C2:						
Lourdes, moderately eroded---------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.32	Depth to saturated zone	0.61	Slope	0.88
			Shrink-swell	0.32	Shrink-swell	0.32
782B:						
Donnan----------------	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
798:						
Protivin--------------	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	0.32	Shrink-swell	0.32	Shrink-swell	0.32
809B:						
Bertram---------------	Somewhat limited		Very limited		Somewhat limited	
	Depth to hard bedrock	0.46	Depth to hard bedrock	1.00	Depth to hard bedrock	0.46
877B:						
Dinsmore--------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	0.61	Shrink-swell	0.50
			Shrink-swell	0.50		
884:						
Klingmore-------------	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
911B:						
Colo------------------	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
Ely-------------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.01	Shrink-swell	0.50	Shrink-swell	0.01

Table 13a.--Building Site Development--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
933:						
Sawmill, occasionally flooded	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	0.32	Shrink-swell	0.50
982:						
Maxmore	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	0.68	Shrink-swell	0.68	Shrink-swell	0.68
1152:						
Marshan, 24 to 40 inches to sand and gravel	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
1226:						
Lawler, 24 to 40 inches to sand and gravel	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
1285G:						
Burkhardt	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
Bassett	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Depth to saturated zone	0.39	Depth to saturated zone	1.00	Depth to saturated zone	0.39
Chelsea	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
1585:						
Spillville, frequently flooded	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
Coland, frequently flooded	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
Aquolls, ponded	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00

Table 13a.--Building Site Development--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
1586:						
Sigglekov, frequently flooded	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
Fluvaquents, frequently flooded	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
Aquents, ponded-----	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
4000:						
Urban land----------	Not rated		Not rated		Not rated	
4007:						
Wiota---------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.06	Shrink-swell	0.82	Shrink-swell	0.06
Urban land----------	Not rated		Not rated		Not rated	
4041:						
Sparta--------------	Not limited		Not limited		Not limited	
Urban land----------	Not rated		Not rated		Not rated	
4041B:						
Sparta--------------	Not limited		Not limited		Not limited	
Urban land----------	Not rated		Not rated		Not rated	
4041C:						
Sparta--------------	Not limited		Not limited		Somewhat limited	
					Slope	0.88
Urban land----------	Not rated		Not rated		Not rated	
4041D:						
Sparta--------------	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.63	Slope	0.63	Slope	1.00
Urban land----------	Not rated		Not rated		Not rated	
4063B:						
Chelsea-------------	Not limited		Not limited		Not limited	
Urban land----------	Not rated		Not rated		Not rated	
4063C:						
Chelsea-------------	Not limited		Not limited		Somewhat limited	
					Slope	0.88
Urban land----------	Not rated		Not rated		Not rated	

Table 13a.--Building Site Development--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
4063D:						
Chelsea	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.63	Slope	0.63	Slope	1.00
Urban land	Not rated		Not rated		Not rated	
4083B:						
Kenyon	Not limited		Somewhat limited		Not limited	
			Depth to saturated zone	0.61		
Urban land	Not rated		Not rated		Not rated	
4083C:						
Kenyon	Not limited		Somewhat limited		Somewhat limited	
			Depth to saturated zone	0.61	Slope	0.88
Urban land	Not rated		Not rated		Not rated	
4083D:						
Kenyon	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.63	Slope	0.63	Slope	1.00
			Depth to saturated zone	0.61		
Urban land	Not rated		Not rated		Not rated	
4084:						
Clyde	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	0.18	Shrink-swell	0.18	Shrink-swell	0.18
Urban land	Not rated		Not rated		Not rated	
4088:						
Nevin	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	0.06	Shrink-swell	0.68	Shrink-swell	0.06
Urban land	Not rated		Not rated		Not rated	
4133:						
Colo, occasionally flooded	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
Urban land	Not rated		Not rated		Not rated	

Table 13a.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements		Dwellings with basements		Small commercial buildings	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4135:						
Coland, occasionally flooded	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
Urban land	Not rated		Not rated		Not rated	
4152:						
Marshan, 24 to 40 inches to sand and gravel	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Urban land	Not rated		Not rated		Not rated	
4159:						
Finchford	Not limited		Not limited		Not limited	
Urban land	Not rated		Not rated		Not rated	
4159C:						
Finchford	Not limited		Not limited		Somewhat limited	
					Slope	0.50
Urban land	Not rated		Not rated		Not rated	
4171B:						
Bassett	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.39	Depth to saturated zone	1.00	Depth to saturated zone	0.39
Urban land	Not rated		Not rated		Not rated	
4171D:						
Bassett	Somewhat limited		Very limited		Very limited	
	Slope	0.63	Depth to saturated zone	1.00	Slope	1.00
	Depth to saturated zone	0.39	Slope	0.63	Depth to saturated zone	0.39
Urban land	Not rated		Not rated		Not rated	
4175:						
Dickinson	Not limited		Not limited		Not limited	
Urban land	Not rated		Not rated		Not rated	
4175B:						
Dickinson	Not limited		Not limited		Not limited	
Urban land	Not rated		Not rated		Not rated	
4177:						
Saude	Not limited		Not limited		Not limited	
Urban land	Not rated		Not rated		Not rated	

Table 13a.--Building Site Development--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
4177B:						
Saude	Not limited		Not limited		Not limited	
Urban land	Not rated		Not rated		Not rated	
4178:						
Waukee	Not limited		Not limited		Not limited	
Urban land	Not rated		Not rated		Not rated	
4184:						
Klinger	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	0.32			Shrink-swell	0.32
Urban land	Not rated		Not rated		Not rated	
4198B:						
Floyd	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Urban land	Not rated		Not rated		Not rated	
4226:						
Lawler, 24 to 40 inches to sand and gravel	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Urban land	Not rated		Not rated		Not rated	
4284:						
Flagler	Not limited		Not limited		Not limited	
Urban land	Not rated		Not rated		Not rated	
4284B:						
Flagler	Not limited		Not limited		Not limited	
Urban land	Not rated		Not rated		Not rated	
4377B:						
Dinsdale	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.68	Depth to saturated zone	0.61	Shrink-swell	0.68
Urban land	Not rated		Not rated		Not rated	
4377C:						
Dinsdale	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.68	Depth to saturated zone	0.61	Slope	0.88
					Shrink-swell	0.68
Urban land	Not rated		Not rated		Not rated	

Table 13a.--Building Site Development--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
4382:						
Maxfield	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Urban land	Not rated		Not rated		Not rated	
4391B:						
Clyde	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	0.18	Shrink-swell	0.18	Shrink-swell	0.18
Floyd	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Urban land	Not rated		Not rated		Not rated	
4398:						
Tripoli	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Urban land	Not rated		Not rated		Not rated	
4399:						
Readlyn	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Urban land	Not rated		Not rated		Not rated	
4408B:						
Olin	Not limited		Not limited		Not limited	
Urban land	Not rated		Not rated		Not rated	
4408C:						
Olin	Not limited		Not limited		Somewhat limited	
					Slope	0.88
Urban land	Not rated		Not rated		Not rated	
4426B:						
Aredale	Not limited		Not limited		Not limited	
Urban land	Not rated		Not rated		Not rated	
4426C:						
Aredale	Not limited		Not limited		Somewhat limited	
					Slope	0.88
Urban land	Not rated		Not rated		Not rated	

Table 13a.--Building Site Development--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
4585:						
Spillville, occasionally flooded	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
Coland, occasionally flooded	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
Urban land	Not rated		Not rated		Not rated	
4761:						
Franklin	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	0.68			Shrink-swell	0.68
Urban land	Not rated		Not rated		Not rated	
4771B:						
Waubeek	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.18	Depth to saturated zone	0.61	Shrink-swell	0.18
Urban land	Not rated		Not rated		Not rated	
4771D:						
Waubeek	Somewhat limited		Somewhat limited		Very limited	
	Shrink-swell	0.18	Depth to saturated zone	0.61	Slope	1.00
	Slope	0.04	Slope	0.04	Shrink-swell	0.18
Urban land	Not rated		Not rated		Not rated	
4798:						
Protivin	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	0.32	Shrink-swell	0.32	Shrink-swell	0.32
Urban land	Not rated		Not rated		Not rated	
4911B:						
Colo	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
Ely	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.01	Shrink-swell	0.50	Shrink-swell	0.01
Urban land	Not rated		Not rated		Not rated	

Table 13a.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements		Dwellings with basements		Small commercial buildings	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4933:						
Sawmill, occasionally flooded-----------	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	0.32	Shrink-swell	0.50
Urban land----------	Not rated		Not rated		Not rated	
4946:						
Orthents, loamy-----	Not rated		Not rated		Not rated	
Urban land----------	Not rated		Not rated		Not rated	
5010:						
Pits, sand and gravel------------	Not rated		Not rated		Not rated	
5030:						
Pits, limestone quarries-----------	Not rated		Not rated		Not rated	
5040:						
Orthents, loamy-----	Not rated		Not rated		Not rated	
5053:						
Psammaquents, frequently flooded	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
5080:						
Orthents, sanitary landfill-----------	Not rated		Not rated		Not rated	
AW:						
Animal waste--------	Not rated		Not rated		Not rated	
SL:						
Sewage lagoon-------	Not rated		Not rated		Not rated	
W:						
Water---------------	Not rated		Not rated		Not rated	

Table 13b.--Building Site Development

(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. "Not rated" indicates that data are not available or that no rating is applicable. See text for further explanation of ratings in this table)

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
7:						
Wiota	Very limited		Very limited		Not limited	
	Frost action	1.00	Cutbanks cave	1.00		
	Low strength	1.00				
	Shrink-swell	0.06				
41:						
Sparta	Not limited		Very limited		Somewhat limited	
			Cutbanks cave	1.00	Droughty	0.12
41B:						
Sparta	Not limited		Very limited		Somewhat limited	
			Cutbanks cave	1.00	Droughty	0.12
41C:						
Sparta	Not limited		Very limited		Somewhat limited	
			Cutbanks cave	1.00	Droughty	0.15
41D:						
Sparta	Somewhat limited		Very limited		Somewhat limited	
	Slope	0.63	Cutbanks cave	1.00	Slope	0.63
			Slope	0.63	Droughty	0.17
63B:						
Chelsea	Not limited		Very limited		Somewhat limited	
			Cutbanks cave	1.00	Droughty	0.28
63C:						
Chelsea	Not limited		Very limited		Somewhat limited	
			Cutbanks cave	1.00	Droughty	0.28
63D:						
Chelsea	Somewhat limited		Very limited		Somewhat limited	
	Slope	0.63	Cutbanks cave	1.00	Slope	0.63
			Slope	0.63	Droughty	0.28
83B:						
Kenyon	Somewhat limited		Somewhat limited		Not limited	
	Frost action	0.50	Depth to saturated zone	0.61		
	Low strength	0.22				
			Cutbanks cave	0.10		
83C:						
Kenyon	Somewhat limited		Somewhat limited		Not limited	
	Frost action	0.50	Depth to saturated zone	0.61		
	Low strength	0.22				
			Cutbanks cave	0.10		
83C2:						
Kenyon, moderately eroded	Somewhat limited		Somewhat limited		Not limited	
	Frost action	0.50	Depth to saturated zone	0.61		
	Low strength	0.22				
			Cutbanks cave	0.10		

Table 13b.--Building Site Development--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
83D2:						
Kenyon, moderately eroded	Somewhat limited		Somewhat limited		Somewhat limited	
	Slope	0.63	Slope	0.63	Slope	0.63
	Frost action	0.50	Depth to saturated zone	0.61		
	Low strength	0.22	Cutbanks cave	0.10		
84:						
Clyde	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Cutbanks cave	0.10		
	Low strength	0.78				
	Shrink-swell	0.18				
88:						
Nevin	Very limited		Very limited		Very limited	
	Low strength	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
	Frost action	1.00				
	Flooding	0.40				
	Shrink-swell	0.06				
133:						
Colo, occasionally flooded	Very limited		Very limited		Very limited	
	Low strength	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	Cutbanks cave	0.10		
	Flooding	1.00				
	Shrink-swell	0.50				
135:						
Coland, occasionally flooded	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	Flooding	0.60	Flooding	0.60
	Flooding	1.00	Cutbanks cave	0.10		
	Low strength	1.00				
	Shrink-swell	0.50				
159:						
Finchford	Not limited		Very limited		Somewhat limited	
			Cutbanks cave	1.00	Droughty	0.60
159C:						
Finchford	Not limited		Very limited		Somewhat limited	
			Cutbanks cave	1.00	Droughty	0.80
171B:						
Bassett	Somewhat limited		Very limited		Somewhat limited	
	Frost action	0.50	Depth to saturated zone	1.00	Depth to saturated zone	0.19
	Low strength	0.22	Cutbanks cave	0.10		
	Depth to saturated zone	0.19				

Table 13b.--Building Site Development--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
175:						
Dickinson-----------	Somewhat limited		Very limited		Not limited	
	Frost action	0.50	Cutbanks cave	1.00		
175B:						
Dickinson-----------	Somewhat limited		Very limited		Not limited	
	Frost action	0.50	Cutbanks cave	1.00		
177:						
Saude---------------	Not limited		Very limited		Not limited	
			Cutbanks cave	1.00		
177B:						
Saude---------------	Not limited		Very limited		Not limited	
			Cutbanks cave	1.00		
178:						
Waukee--------------	Not limited		Very limited		Not limited	
			Cutbanks cave	1.00		
178B:						
Waukee--------------	Not limited		Very limited		Not limited	
			Cutbanks cave	1.00		
184:						
Klinger-------------	Very limited		Very limited		Very limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Cutbanks cave	0.10		
	Frost action	1.00				
	Shrink-swell	0.32				
198B:						
Floyd---------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Cutbanks cave	0.10		
213B:						
Rockton, 30 to 40 inches to limestone	Somewhat limited		Very limited		Somewhat limited	
	Frost action	0.50	Depth to hard bedrock	1.00	Depth to bedrock	0.10
	Shrink-swell	0.32	Too clayey	0.32		
	Low strength	0.22	Cutbanks cave	0.10		
	Depth to hard bedrock	0.10				
221:						
Klossner------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Subsidence	1.00	Content of organic matter	1.00		
	Frost action	1.00	Cutbanks cave	0.10		
284:						
Flagler-------------	Not limited		Very limited		Not limited	
			Cutbanks cave	1.00		

Table 13b.--Building Site Development--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
284B:						
Flagler	Not limited		Very limited		Not limited	
			Cutbanks cave	1.00		
290:						
Dells	Very limited		Very limited		Very limited	
	Low strength	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
	Frost action	1.00				
	Shrink-swell	0.18				
354:						
Aquolls, ponded	Not rated		Very limited		Not rated	
			Ponding	1.00		
			Depth to saturated zone	1.00		
			Cutbanks cave	0.10		
377B:						
Dinsdale	Very limited		Somewhat limited		Not limited	
	Low strength	1.00	Depth to saturated zone	0.61		
	Frost action	1.00	Cutbanks cave	0.10		
	Shrink-swell	0.68				
377C:						
Dinsdale	Very limited		Somewhat limited		Not limited	
	Low strength	1.00	Depth to saturated zone	0.61		
	Frost action	1.00	Cutbanks cave	0.10		
	Shrink-swell	0.68				
377C2:						
Dinsdale, moderately eroded	Very limited		Somewhat limited		Not limited	
	Low strength	1.00	Depth to saturated zone	0.61		
	Frost action	1.00	Cutbanks cave	0.10		
	Shrink-swell	0.68				
382:						
Maxfield	Very limited		Very limited		Very limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Cutbanks cave	0.10		
	Frost action	1.00				
391B:						
Clyde	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Cutbanks cave	0.10		
	Low strength	0.78				
	Shrink-swell	0.18				
Floyd	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Cutbanks cave	0.10		

Table 13b.--Building Site Development--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
395B:						
Marquis	Somewhat limited		Very limited		Somewhat limited	
	Frost action	0.50	Depth to saturated zone	1.00	Depth to saturated zone	0.19
	Depth to saturated zone	0.19	Cutbanks cave	0.10		
398:						
Tripoli	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Cutbanks cave	0.10		
	Low strength	0.22				
399:						
Readlyn	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Cutbanks cave	0.10		
408B:						
Olin	Somewhat limited		Somewhat limited		Not limited	
	Frost action	0.50	Cutbanks cave	0.10		
408C:						
Olin	Somewhat limited		Somewhat limited		Not limited	
	Frost action	0.50	Cutbanks cave	0.10		
412C:						
Emeline	Very limited		Very limited		Very limited	
	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
					Droughty	1.00
	Low strength	1.00	Cutbanks cave	0.10	Content of large stones	0.01
	Frost action	0.50				
426B:						
Aredale	Somewhat limited		Somewhat limited		Not limited	
	Frost action	0.50	Cutbanks cave	0.10		
	Low strength	0.22				
426C:						
Aredale	Somewhat limited		Somewhat limited		Not limited	
	Frost action	0.50	Cutbanks cave	0.10		
	Low strength	0.22				
426C2:						
Aredale, moderately eroded	Somewhat limited		Somewhat limited		Not limited	
	Frost action	0.50	Cutbanks cave	0.10		
	Low strength	0.22				
468B:						
Dunkerton	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	0.50	Cutbanks cave	0.10		
	Shrink-swell	0.06				

Table 13b.--Building Site Development--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
468C:						
Dunkerton	Very limited Depth to saturated zone Frost action Shrink-swell	 1.00 0.50 0.06	Very limited Depth to saturated zone Cutbanks cave	 1.00 0.10	Very limited Depth to saturated zone	 1.00
471:						
Oran	Very limited Depth to saturated zone Frost action Low strength	 1.00 1.00 0.22	Very limited Depth to saturated zone Cutbanks cave	 1.00 0.10	Very limited Depth to saturated zone	 1.00
485:						
Spillville, occasionally flooded	Very limited Depth to saturated zone Flooding Low strength Frost action	 1.00 1.00 1.00 0.50	Very limited Depth to saturated zone Flooding Cutbanks cave	 1.00 0.60 0.10	Very limited Depth to saturated zone Flooding	 1.00 0.60
585:						
Spillville, occasionally flooded	Very limited Depth to saturated zone Flooding Low strength Frost action	 1.00 1.00 1.00 0.50	Very limited Depth to saturated zone Flooding Cutbanks cave	 1.00 0.60 0.10	Very limited Depth to saturated zone Flooding	 1.00 0.60
Coland, occasionally flooded	Very limited Depth to saturated zone Frost action Flooding Low strength Shrink-swell	 1.00 1.00 1.00 1.00 0.50	Very limited Depth to saturated zone Flooding Cutbanks cave	 1.00 0.60 0.10	Very limited Depth to saturated zone Flooding	 1.00 0.60
626:						
Hayfield, 24 to 40 inches to sand and gravel	Very limited Depth to saturated zone Frost action	 1.00 1.00	Very limited Cutbanks cave Depth to saturated zone	 1.00 1.00	Very limited Depth to saturated zone	 1.00
761:						
Franklin	Very limited Low strength Depth to saturated zone Frost action Shrink-swell	 1.00 1.00 1.00 0.68	Very limited Depth to saturated zone Cutbanks cave	 1.00 0.10	Very limited Depth to saturated zone	 1.00

Table 13b.--Building Site Development--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
771B:						
Waubeek-------------	Very limited		Somewhat limited		Not limited	
	Low strength	1.00	Depth to saturated zone	0.61		
	Frost action	1.00				
	Shrink-swell	0.18	Cutbanks cave	0.10		
775B:						
Billett-------------	Somewhat limited		Very limited		Not limited	
	Frost action	0.50	Cutbanks cave	1.00		
776C:						
Lilah---------------	Not limited		Very limited		Somewhat limited	
			Cutbanks cave	1.00	Droughty	0.89
777:						
Wapsie--------------	Not limited		Very limited		Not limited	
			Cutbanks cave	1.00		
781B:						
Lourdes-------------	Very limited		Somewhat limited		Not limited	
	Frost action	1.00	Depth to saturated zone	0.61		
	Low strength	1.00				
	Shrink-swell	0.32	Cutbanks cave	0.10		
781C2:						
Lourdes, moderately eroded------------	Very limited		Somewhat limited		Not limited	
	Frost action	1.00	Depth to saturated zone	0.61		
	Low strength	1.00				
	Shrink-swell	0.32	Cutbanks cave	0.10		
782B:						
Donnan--------------	Very limited		Very limited		Very limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	1.00				
	Depth to saturated zone	1.00	Too clayey	0.41		
			Cutbanks cave	0.10		
	Frost action	1.00				
798:						
Protivin------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Cutbanks cave	0.10		
	Low strength	1.00				
	Shrink-swell	0.32				
809B:						
Bertram-------------	Somewhat limited		Very limited		Somewhat limited	
	Frost action	0.50	Cutbanks cave	1.00	Depth to bedrock	0.46
	Depth to hard bedrock	0.46	Depth to hard bedrock	1.00	Droughty	0.02
877B:						
Dinsmore------------	Very limited		Somewhat limited		Not limited	
	Low strength	1.00	Depth to saturated zone	0.61		
	Frost action	1.00				
	Shrink-swell	0.50	Cutbanks cave	0.10		

Table 13b.--Building Site Development--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
884:						
Klingmore-----------	Very limited		Very limited		Very limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Cutbanks cave	0.10		
	Frost action	1.00				
	Shrink-swell	0.50				
911B:						
Colo----------------	Very limited		Very limited		Very limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Cutbanks cave	0.10		
	Frost action	1.00				
	Shrink-swell	0.50				
Ely-----------------	Very limited		Very limited		Very limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Cutbanks cave	0.10		
	Frost action	1.00				
	Shrink-swell	0.01				
933:						
Sawmill, occasionally flooded-----------	Very limited		Very limited		Very limited	
	Low strength	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	Cutbanks cave	0.10		
	Flooding	1.00				
	Shrink-swell	0.50				
982:						
Maxmore-------------	Very limited		Very limited		Very limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Cutbanks cave	0.10		
	Frost action	1.00				
	Shrink-swell	0.68				
1152:						
Marshan, 24 to 40 inches to sand and gravel------------	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		
1226:						
Lawler, 24 to 40 inches to sand and gravel------------	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 13b.--Building Site Development--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
1285G:						
Burkhardt-----------	Very limited		Very limited		Very limited	
	Slope	1.00	Cutbanks cave	1.00	Slope	1.00
			Slope	1.00	Droughty	0.14
Bassett------------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	0.22	Depth to saturated zone	1.00	Depth to saturated zone	0.19
	Depth to saturated zone	0.19	Cutbanks cave	0.10		
Chelsea------------	Very limited		Very limited		Very limited	
	Slope	1.00	Cutbanks cave	1.00	Slope	1.00
			Slope	1.00	Droughty	0.48
1585:						
Spillville, frequently flooded	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
	Flooding	1.00	Flooding	0.80	Depth to saturated zone	1.00
	Low strength	1.00	Cutbanks cave	0.10		
	Frost action	0.50				
Coland, frequently flooded-----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
	Frost action	1.00	Flooding	0.80	Depth to saturated zone	1.00
	Flooding	1.00	Cutbanks cave	0.10		
	Low strength	1.00				
	Shrink-swell	0.50				
Aquolls, ponded-----	Not rated		Very limited		Not rated	
			Ponding	1.00		
			Depth to saturated zone	1.00		
			Cutbanks cave	0.10		
1586:						
Sigglekov, frequently flooded	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Flooding	1.00
	Flooding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
			Flooding	0.80	Droughty	0.98
Fluvaquents, frequently flooded	Not rated		Very limited		Not rated	
			Depth to saturated zone	1.00		
			Flooding	0.80		
			Cutbanks cave	0.10		
Aquents, ponded-----	Not rated		Very limited		Not rated	
			Ponding	1.00		
			Depth to saturated zone	1.00		
			Cutbanks cave	0.10		

Table 13b.--Building Site Development--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
4000:						
Urban land	Not rated		Not rated		Not rated	
4007:						
Wiota	Very limited		Very limited		Not limited	
	Frost action	1.00	Cutbanks cave	1.00		
	Low strength	1.00				
	Shrink-swell	0.06				
Urban land	Not rated		Not rated		Not rated	
4041:						
Sparta	Not limited		Very limited		Somewhat limited	
			Cutbanks cave	1.00	Droughty	0.12
Urban land	Not rated		Not rated		Not rated	
4041B:						
Sparta	Not limited		Very limited		Somewhat limited	
			Cutbanks cave	1.00	Droughty	0.12
Urban land	Not rated		Not rated		Not rated	
4041C:						
Sparta	Not limited		Very limited		Somewhat limited	
			Cutbanks cave	1.00	Droughty	0.15
Urban land	Not rated		Not rated		Not rated	
4041D:						
Sparta	Somewhat limited		Very limited		Somewhat limited	
	Slope	0.63	Cutbanks cave	1.00	Slope	0.63
			Slope	0.63	Droughty	0.17
Urban land	Not rated		Not rated		Not rated	
4063B:						
Chelsea	Not limited		Very limited		Somewhat limited	
			Cutbanks cave	1.00	Droughty	0.28
Urban land	Not rated		Not rated		Not rated	
4063C:						
Chelsea	Not limited		Very limited		Somewhat limited	
			Cutbanks cave	1.00	Droughty	0.28
Urban land	Not rated		Not rated		Not rated	
4063D:						
Chelsea	Somewhat limited		Very limited		Somewhat limited	
	Slope	0.63	Cutbanks cave	1.00	Slope	0.63
			Slope	0.63	Droughty	0.28
Urban land	Not rated		Not rated		Not rated	
4083B:						
Kenyon	Somewhat limited		Somewhat limited		Not limited	
	Frost action	0.50	Depth to saturated zone	0.61		
	Low strength	0.22				
			Cutbanks cave	0.10		

Table 13b.--Building Site Development--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
4083B:						
Urban land	Not rated		Not rated		Not rated	
4083C:						
Kenyon	Somewhat limited		Somewhat limited		Not limited	
	Frost action	0.50	Depth to saturated zone	0.61		
	Low strength	0.22	Cutbanks cave	0.10		
Urban land	Not rated		Not rated		Not rated	
4083D:						
Kenyon	Somewhat limited		Somewhat limited		Somewhat limited	
	Slope	0.63	Slope	0.63	Slope	0.63
	Frost action	0.50	Depth to saturated zone	0.61		
	Low strength	0.22	Cutbanks cave	0.10		
Urban land	Not rated		Not rated		Not rated	
4084:						
Clyde	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Cutbanks cave	0.10		
	Low strength	0.78				
	Shrink-swell	0.18				
Urban land	Not rated		Not rated		Not rated	
4088:						
Nevin	Very limited		Very limited		Very limited	
	Low strength	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
	Frost action	1.00				
	Flooding	0.40				
	Shrink-swell	0.06				
Urban land	Not rated		Not rated		Not rated	
4133:						
Colo, occasionally flooded	Very limited		Very limited		Very limited	
	Low strength	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	Cutbanks cave	0.10		
	Flooding	1.00				
	Shrink-swell	0.50				
Urban land	Not rated		Not rated		Not rated	

Table 13b.--Building Site Development--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
4135:						
Coland, occasionally flooded	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	Flooding	0.60	Flooding	0.60
	Flooding	1.00	Cutbanks cave	0.10		
	Low strength	1.00				
	Shrink-swell	0.50				
Urban land	Not rated		Not rated		Not rated	
4152:						
Marshan, 24 to 40 inches to sand and gravel	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		
Urban land	Not rated		Not rated		Not rated	
4159:						
Finchford	Not limited		Very limited		Somewhat limited	
			Cutbanks cave	1.00	Droughty	0.60
Urban land	Not rated		Not rated		Not rated	
4159C:						
Finchford	Not limited		Very limited		Somewhat limited	
			Cutbanks cave	1.00	Droughty	0.80
Urban land	Not rated		Not rated		Not rated	
4171B:						
Bassett	Somewhat limited		Very limited		Somewhat limited	
	Frost action	0.50	Depth to saturated zone	1.00	Depth to saturated zone	0.19
	Low strength	0.22	Cutbanks cave	0.10		
	Depth to saturated zone	0.19				
Urban land	Not rated		Not rated		Not rated	
4171D:						
Bassett	Somewhat limited		Very limited		Somewhat limited	
	Slope	0.63	Depth to saturated zone	1.00	Slope	0.63
	Frost action	0.50	Slope	0.63	Depth to saturated zone	0.19
	Low strength	0.22	Cutbanks cave	0.10		
	Depth to saturated zone	0.19				
Urban land	Not rated		Not rated		Not rated	
4175:						
Dickinson	Somewhat limited		Very limited		Not limited	
	Frost action	0.50	Cutbanks cave	1.00		
Urban land	Not rated		Not rated		Not rated	

Table 13b.--Building Site Development--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
4175B:						
Dickinson	Somewhat limited		Very limited		Not limited	
	Frost action	0.50	Cutbanks cave	1.00		
Urban land	Not rated		Not rated		Not rated	
4177:						
Saude	Not limited		Very limited		Not limited	
			Cutbanks cave	1.00		
Urban land	Not rated		Not rated		Not rated	
4177B:						
Saude	Not limited		Very limited		Not limited	
			Cutbanks cave	1.00		
Urban land	Not rated		Not rated		Not rated	
4178:						
Waukee	Not limited		Very limited		Not limited	
			Cutbanks cave	1.00		
Urban land	Not rated		Not rated		Not rated	
4184:						
Klinger	Very limited		Very limited		Very limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Cutbanks cave	0.10		
	Frost action	1.00				
	Shrink-swell	0.32				
Urban land	Not rated		Not rated		Not rated	
4198B:						
Floyd	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Cutbanks cave	0.10		
Urban land	Not rated		Not rated		Not rated	
4226:						
Lawler, 24 to 40 inches to sand and gravel	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		
Urban land	Not rated		Not rated		Not rated	
4284:						
Flagler	Not limited		Very limited		Not limited	
			Cutbanks cave	1.00		
Urban land	Not rated		Not rated		Not rated	

Table 13b.--Building Site Development--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
4284B:						
Flagler	Not limited		Very limited		Not limited	
			Cutbanks cave	1.00		
Urban land	Not rated		Not rated		Not rated	
4377B:						
Dinsdale	Very limited		Somewhat limited		Not limited	
	Low strength	1.00	Depth to saturated zone	0.61		
	Frost action	1.00	Cutbanks cave	0.10		
	Shrink-swell	0.68				
Urban land	Not rated		Not rated		Not rated	
4377C:						
Dinsdale	Very limited		Somewhat limited		Not limited	
	Low strength	1.00	Depth to saturated zone	0.61		
	Frost action	1.00	Cutbanks cave	0.10		
	Shrink-swell	0.68				
Urban land	Not rated		Not rated		Not rated	
4382:						
Maxfield	Very limited		Very limited		Very limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Cutbanks cave	0.10		
	Frost action	1.00				
Urban land	Not rated		Not rated		Not rated	
4391B:						
Clyde	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Cutbanks cave	0.10		
	Low strength	0.78				
	Shrink-swell	0.18				
Floyd	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Cutbanks cave	0.10		
Urban land	Not rated		Not rated		Not rated	
4398:						
Tripoli	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Cutbanks cave	0.10		
	Low strength	0.22				
Urban land	Not rated		Not rated		Not rated	
4399:						
Readlyn	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Cutbanks cave	0.10		

Table 13b.--Building Site Development--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
4399:						
Urban land	Not rated		Not rated		Not rated	
4408B:						
Olin	Somewhat limited		Somewhat limited		Not limited	
	Frost action	0.50	Cutbanks cave	0.10		
Urban land	Not rated		Not rated		Not rated	
4408C:						
Olin	Somewhat limited		Somewhat limited		Not limited	
	Frost action	0.50	Cutbanks cave	0.10		
Urban land	Not rated		Not rated		Not rated	
4426B:						
Aredale	Somewhat limited		Somewhat limited		Not limited	
	Frost action	0.50	Cutbanks cave	0.10		
	Low strength	0.22				
Urban land	Not rated		Not rated		Not rated	
4426C:						
Aredale	Somewhat limited		Somewhat limited		Not limited	
	Frost action	0.50	Cutbanks cave	0.10		
	Low strength	0.22				
Urban land	Not rated		Not rated		Not rated	
4585:						
Spillville, occasionally flooded	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	Flooding	0.60
	Low strength	1.00	Cutbanks cave	0.10		
	Frost action	0.50				
Coland, occasionally flooded	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	Flooding	0.60	Flooding	0.60
	Flooding	1.00	Cutbanks cave	0.10		
	Low strength	1.00				
	Shrink-swell	0.50				
Urban land	Not rated		Not rated		Not rated	
4761:						
Franklin	Very limited		Very limited		Very limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Cutbanks cave	0.10		
	Frost action	1.00				
	Shrink-swell	0.68				
Urban land	Not rated		Not rated		Not rated	

Table 13b.--Building Site Development--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
4771B:						
Waubeek	Very limited		Somewhat limited		Not limited	
	Low strength	1.00	Depth to saturated zone	0.61		
	Frost action	1.00				
	Shrink-swell	0.18	Cutbanks cave	0.10		
Urban land	Not rated		Not rated		Not rated	
4771D:						
Waubeek	Very limited		Somewhat limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	0.61	Slope	0.04
	Frost action	1.00				
	Shrink-swell	0.18	Cutbanks cave	0.10		
	Slope	0.04	Slope	0.04		
Urban land	Not rated		Not rated		Not rated	
4798:						
Protivin	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Cutbanks cave	0.10		
	Low strength	1.00				
	Shrink-swell	0.32				
Urban land	Not rated		Not rated		Not rated	
4911B:						
Colo	Very limited		Very limited		Very limited	
	Low strength	1.00	Depth to saturated zone	1.00	Flooding	1.00
	Depth to saturated zone	1.00			Depth to saturated zone	1.00
			Flooding	0.80		
	Frost action	1.00	Cutbanks cave	0.10		
	Flooding	1.00				
	Shrink-swell	0.50				
Ely	Very limited		Very limited		Very limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00				
			Cutbanks cave	0.10		
	Frost action	1.00				
	Shrink-swell	0.01				
Urban land	Not rated		Not rated		Not rated	
4933:						
Sawmill, occasionally flooded	Very limited		Very limited		Very limited	
	Low strength	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	Cutbanks cave	0.10		
	Flooding	1.00				
	Shrink-swell	0.50				
Urban land	Not rated		Not rated		Not rated	

Table 13b.--Building Site Development--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
4946:						
Orthents, loamy-----	Not rated		Not rated		Not rated	
Urban land----------	Not rated		Not rated		Not rated	
5010:						
Pits, sand and gravel-------------	Not rated		Not rated		Not rated	
5030:						
Pits, limestone quarries-----------	Not rated		Not rated		Not rated	
5040:						
Orthents, loamy-----	Not rated		Not rated		Not rated	
5053:						
Psammaquents, frequently flooded	Not rated		Very limited		Not rated	
			Depth to saturated zone	1.00		
			Flooding	0.80		
			Cutbanks cave	0.10		
5080:						
Orthents, sanitary landfill-----------	Not rated		Not rated		Not rated	
AW:						
Animal waste--------	Not rated		Not rated		Not rated	
SL:						
Sewage lagoon-------	Not rated		Not rated		Not rated	
W:						
Water---------------	Not rated		Not rated		Not rated	

Table 14a.--Sanitary Facilities

(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. "Not rated" indicates that data are not available or that no rating is applicable. See text 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
7:				
Wiota	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.25		
41:				
Sparta	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
41B:				
Sparta	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.32
41C:				
Sparta	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	1.00
41D:				
Sparta	Very limited		Very limited	
	Filtering capacity	1.00	Slope	1.00
			Seepage	1.00
	Slope	0.63		
63B:				
Chelsea	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.32
63C:				
Chelsea	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	1.00
63D:				
Chelsea	Very limited		Very limited	
	Filtering capacity	1.00	Slope	1.00
			Seepage	1.00
	Slope	0.63		
83B:				
Kenyon	Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.71
	Restricted permeability	0.25	Seepage	0.50
			Slope	0.32

Table 14a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
83C:				
Kenyon	Very limited		Very limited	
	Depth to saturated zone	1.00	Slope	1.00
	Restricted permeability	0.25	Depth to saturated zone	0.71
			Seepage	0.50
83C2:				
Kenyon, moderately eroded	Very limited		Very limited	
	Depth to saturated zone	1.00	Slope	1.00
	Restricted permeability	0.25	Depth to saturated zone	0.71
			Seepage	0.50
83D2:				
Kenyon, moderately eroded	Very limited		Very limited	
	Depth to saturated zone	1.00	Slope	1.00
	Slope	0.63	Depth to saturated zone	0.71
	Restricted permeability	0.25	Seepage	0.50
84:				
Clyde	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.25	Seepage	0.50
88:				
Nevin	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Flooding	0.40	Seepage	0.50
	Restricted permeability	0.25	Flooding	0.40
133:				
Colo, occasionally flooded	Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Flooding	1.00
	Restricted permeability	0.25	Seepage	0.50
135:				
Coland, occasionally flooded	Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Flooding	1.00
	Restricted permeability	0.25	Seepage	1.00
159:				
Finchford	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00

Table 14a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
159C:				
Finchford-----------	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.92
171B:				
Bassett-------------	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.35	Seepage	0.50
			Slope	0.32
175:				
Dickinson-----------	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
175B:				
Dickinson-----------	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.32
177:				
Saude---------------	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
177B:				
Saude---------------	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.32
178:				
Waukee--------------	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.25		
178B:				
Waukee--------------	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.32
	Restricted permeability	0.25		
184:				
Klinger-------------	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.25	Seepage	0.50
198B:				
Floyd---------------	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.25	Seepage	1.00
			Slope	0.08

Table 14a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
213B:				
Rockton, 30 to 40 inches to limestone	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to hard bedrock	1.00
	Restricted permeability	0.25	Seepage	0.50
			Slope	0.32
221:				
Klossner------------	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Subsidence	1.00	Seepage	1.00
	Restricted permeability	0.25	Content of organic matter	1.00
284:				
Flagler-------------	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
284B:				
Flagler-------------	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.32
290:				
Dells---------------	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	0.35		
354:				
Aquolls, ponded-----	Very limited		Not rated	
	Ponding	1.00		
	Depth to saturated zone	1.00		
377B:				
Dinsdale------------	Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.71
	Restricted permeability	0.25	Seepage	0.50
			Slope	0.32
377C:				
Dinsdale------------	Very limited		Very limited	
	Depth to saturated zone	1.00	Slope	1.00
	Restricted permeability	0.25	Depth to saturated zone	0.71
			Seepage	0.50

Table 14a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
377C2:				
Dinsdale, moderately eroded	Very limited		Very limited	
	Depth to saturated zone	1.00	Slope	1.00
	Restricted permeability	0.25	Depth to saturated zone	0.71
			Seepage	0.50
382:				
Maxfield	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.25	Seepage	0.50
391B:				
Clyde	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.25	Seepage	0.50
Floyd	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.25	Seepage	1.00
			Slope	0.08
395B:				
Marquis	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.25	Seepage	0.50
			Slope	0.32
398:				
Tripoli	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.25	Seepage	0.50
399:				
Readlyn	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.25	Seepage	0.50
408B:				
Olin	Not limited		Very limited	
	Restricted permeability	0.25	Seepage	1.00
			Slope	0.32
408C:				
Olin	Not limited		Very limited	
	Restricted permeability	0.25	Seepage	1.00
			Slope	1.00

Table 14a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
412C:				
Emeline	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to hard bedrock	1.00
			Slope	0.92
426B:				
Aredale	Somewhat limited		Very limited	
	Restricted permeability	0.91	Seepage	1.00
			Slope	0.32
426C:				
Aredale	Somewhat limited		Very limited	
	Restricted permeability	0.91	Seepage	1.00
			Slope	1.00
426C2:				
Aredale, moderately eroded	Somewhat limited		Very limited	
	Restricted permeability	0.91	Seepage	1.00
			Slope	1.00
468B:				
Dunkerton	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.91	Seepage	1.00
			Slope	0.32
468C:				
Dunkerton	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.91	Seepage	1.00
			Slope	1.00
471:				
Oran	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.35	Seepage	0.50
485:				
Spillville, occasionally flooded	Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Flooding	1.00
	Restricted permeability	0.25	Seepage	1.00

Table 14a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
585:				
Spillville, occasionally flooded	Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Flooding	1.00
	Restricted permeability	0.25	Seepage	1.00
Coland, occasionally flooded	Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Flooding	1.00
	Restricted permeability	0.25	Seepage	1.00
626:				
Hayfield, 24 to 40 inches to sand and gravel	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	0.35		
761:				
Franklin	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.35	Seepage	0.50
771B:				
Waubeek	Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.71
	Restricted permeability	0.35	Seepage	0.50
			Slope	0.32
775B:				
Billett	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.32
776C:				
Lilah	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.92
777:				
Wapsie	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.35		

Table 14a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
781B:				
Lourdes	Very limited		Somewhat limited	
	Restricted permeability	1.00	Depth to saturated zone	0.71
	Depth to saturated zone	1.00	Seepage	0.50
			Slope	0.32
781C2:				
Lourdes, moderately eroded	Very limited		Very limited	
	Restricted permeability	1.00	Slope	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	0.71
782B:				
Donnan	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.50
			Slope	0.32
798:				
Protivin	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.91	Seepage	0.50
809B:				
Bertram	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to hard bedrock	1.00
			Seepage	1.00
			Slope	0.32
877B:				
Dinsmore	Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.71
	Restricted permeability	0.25	Seepage	0.50
			Slope	0.32
884:				
Klingmore	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.25	Seepage	0.50
911B:				
Colo	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.25	Seepage	0.50

Table 14a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
911B:				
Ely	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.25	Seepage	0.50
			Slope	0.32
933:				
Sawmill, occasionally flooded	Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Flooding	1.00
	Restricted permeability	0.25	Seepage	0.50
982:				
Maxmore	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.25	Seepage	0.50
1152:				
Marshan, 24 to 40 inches to sand and gravel	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	0.25		
1226:				
Lawler, 24 to 40 inches to sand and gravel	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	0.25		
1285G:				
Burkhardt	Very limited		Very limited	
	Filtering capacity	1.00	Slope	1.00
	Slope	1.00	Seepage	1.00
Bassett	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Slope	1.00	Slope	1.00
	Restricted permeability	0.35	Seepage	0.50

Table 14a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
1285G:				
Chelsea	Very limited		Very limited	
	Filtering capacity	1.00	Slope	1.00
	Slope	1.00	Seepage	1.00
1585:				
Spillville, frequently flooded	Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Flooding	1.00
	Restricted permeability	0.25	Seepage	1.00
Coland, frequently flooded	Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Flooding	1.00
	Restricted permeability	0.25	Seepage	1.00
Aquolls, ponded	Very limited		Not rated	
	Ponding	1.00		
	Depth to saturated zone	1.00		
1586:				
Sigglekov, frequently flooded	Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Flooding	1.00
	Filtering capacity	1.00	Seepage	1.00
Fluvaquents, frequently flooded	Very limited		Not rated	
	Flooding	1.00		
	Depth to saturated zone	1.00		
Aquents, ponded	Very limited		Not rated	
	Ponding	1.00		
	Depth to saturated zone	1.00		
4000:				
Urban land	Not rated		Not rated	
4007:				
Wiota	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.25		
Urban land	Not rated		Not rated	

Table 14a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
4041:				
Sparta--------------	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
Urban land----------	Not rated		Not rated	
4041B:				
Sparta--------------	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.32
Urban land----------	Not rated		Not rated	
4041C:				
Sparta--------------	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	1.00
Urban land----------	Not rated		Not rated	
4041D:				
Sparta--------------	Very limited		Very limited	
	Filtering capacity	1.00	Slope	1.00
			Seepage	1.00
	Slope	0.63		
Urban land----------	Not rated		Not rated	
4063B:				
Chelsea-------------	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.32
Urban land----------	Not rated		Not rated	
4063C:				
Chelsea-------------	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	1.00
Urban land----------	Not rated		Not rated	
4063D:				
Chelsea-------------	Very limited		Very limited	
	Filtering capacity	1.00	Slope	1.00
			Seepage	1.00
	Slope	0.63		
Urban land----------	Not rated		Not rated	
4083B:				
Kenyon--------------	Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.71
	Restricted permeability	0.25	Seepage	0.50
			Slope	0.32
Urban land----------	Not rated		Not rated	

Table 14a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
4083C:				
Kenyon	Very limited		Very limited	
	Depth to saturated zone	1.00	Slope	1.00
	Restricted permeability	0.25	Depth to saturated zone	0.71
			Seepage	0.50
Urban land	Not rated		Not rated	
4083D:				
Kenyon	Very limited		Very limited	
	Depth to saturated zone	1.00	Slope	1.00
	Slope	0.63	Depth to saturated zone	0.71
	Restricted permeability	0.25	Seepage	0.50
Urban land	Not rated		Not rated	
4084:				
Clyde	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.25	Seepage	0.50
Urban land	Not rated		Not rated	
4088:				
Nevin	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Flooding	0.40	Seepage	0.50
	Restricted permeability	0.25	Flooding	0.40
Urban land	Not rated		Not rated	
4133:				
Colo, occasionally flooded	Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Flooding	1.00
	Restricted permeability	0.25	Seepage	0.50
Urban land	Not rated		Not rated	
4135:				
Coland, occasionally flooded	Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Flooding	1.00
	Restricted permeability	0.25	Seepage	1.00
Urban land	Not rated		Not rated	

Table 14a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
4152:				
Marshan, 24 to 40 inches to sand and gravel	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	0.25		
Urban land	Not rated		Not rated	
4159:				
Finchford	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
Urban land	Not rated		Not rated	
4159C:				
Finchford	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.92
Urban land	Not rated		Not rated	
4171B:				
Bassett	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.35	Seepage	0.50
			Slope	0.32
Urban land	Not rated		Not rated	
4171D:				
Bassett	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Slope	0.63	Slope	1.00
	Restricted permeability	0.35	Seepage	0.50
Urban land	Not rated		Not rated	
4175:				
Dickinson	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
Urban land	Not rated		Not rated	
4175B:				
Dickinson	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.32
Urban land	Not rated		Not rated	

Table 14a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
4177:				
Saude	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
Urban land	Not rated		Not rated	
4177B:				
Saude	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.32
Urban land	Not rated		Not rated	
4178:				
Waukee	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.25		
Urban land	Not rated		Not rated	
4184:				
Klinger	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.25	Seepage	0.50
Urban land	Not rated		Not rated	
4198B:				
Floyd	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.25	Seepage	1.00
			Slope	0.08
Urban land	Not rated		Not rated	
4226:				
Lawler, 24 to 40 inches to sand and gravel	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	0.25		
Urban land	Not rated		Not rated	
4284:				
Flagler	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
Urban land	Not rated		Not rated	

Table 14a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
4284B:				
Flagler	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.32
Urban land	Not rated		Not rated	
4377B:				
Dinsdale	Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.71
	Restricted permeability	0.25	Seepage	0.50
			Slope	0.32
Urban land	Not rated		Not rated	
4377C:				
Dinsdale	Very limited		Very limited	
	Depth to saturated zone	1.00	Slope	1.00
	Restricted permeability	0.25	Depth to saturated zone	0.71
			Seepage	0.50
Urban land	Not rated		Not rated	
4382:				
Maxfield	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.25	Seepage	0.50
Urban land	Not rated		Not rated	
4391B:				
Clyde	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.25	Seepage	0.50
Floyd	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.25	Seepage	1.00
			Slope	0.08
Urban land	Not rated		Not rated	
4398:				
Tripoli	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.25	Seepage	0.50
Urban land	Not rated		Not rated	

Table 14a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
4399:				
Readlyn-------------	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.25	Seepage	0.50
Urban land----------	Not rated		Not rated	
4408B:				
Olin----------------	Not limited		Very limited	
	Restricted permeability	0.25	Seepage	1.00
			Slope	0.32
Urban land----------	Not rated		Not rated	
4408C:				
Olin----------------	Not limited		Very limited	
	Restricted permeability	0.25	Seepage	1.00
			Slope	1.00
Urban land----------	Not rated		Not rated	
4426B:				
Aredale-------------	Somewhat limited		Very limited	
	Restricted permeability	0.91	Seepage	1.00
			Slope	0.32
Urban land----------	Not rated		Not rated	
4426C:				
Aredale-------------	Somewhat limited		Very limited	
	Restricted permeability	0.91	Seepage	1.00
			Slope	1.00
Urban land----------	Not rated		Not rated	
4585:				
Spillville, occasionally flooded------------	Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Flooding	1.00
	Restricted permeability	0.25	Seepage	1.00
Coland, occasionally flooded------------	Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Flooding	1.00
	Restricted permeability	0.25	Seepage	1.00
Urban land----------	Not rated		Not rated	

Table 14a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
4761:				
Franklin------------	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.35	Seepage	0.50
Urban land----------	Not rated		Not rated	
4771B:				
Waubeek-------------	Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.71
	Restricted permeability	0.35	Seepage	0.50
			Slope	0.32
Urban land----------	Not rated		Not rated	
4771D:				
Waubeek-------------	Very limited		Very limited	
	Depth to saturated zone	1.00	Slope	1.00
	Restricted permeability	0.35	Depth to saturated zone	0.71
	Slope	0.04	Seepage	0.50
Urban land----------	Not rated		Not rated	
4798:				
Protivin------------	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.91	Seepage	0.50
Urban land----------	Not rated		Not rated	
4911B:				
Colo----------------	Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Flooding	1.00
	Restricted permeability	0.25	Seepage	0.50
Ely-----------------	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.25	Seepage	0.50
			Slope	0.32
Urban land----------	Not rated		Not rated	

Table 14a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
4933:				
Sawmill, occasionally flooded	Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Flooding	1.00
	Restricted permeability	0.25	Seepage	0.50
Urban land	Not rated		Not rated	
4946:				
Orthents, loamy	Not rated		Not rated	
Urban land	Not rated		Not rated	
5010:				
Pits, sand and gravel	Not rated		Not rated	
5030:				
Pits, limestone quarries	Not rated		Not rated	
5040:				
Orthents, loamy	Not rated		Not rated	
5053:				
Psammaquents, frequently flooded	Very limited		Not rated	
	Flooding	1.00		
	Depth to saturated zone	1.00		
5080:				
Orthents, sanitary landfill	Not rated		Not rated	
AW:				
Animal waste	Not rated		Not rated	
SL:				
Sewage lagoon	Not rated		Not rated	
W:				
Water	Not rated		Not rated	

Table 14b.--Sanitary Facilities

(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. "Not rated" indicates that data are not available or that no rating is applicable. See text for further explanation of ratings in this table)

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
7:						
Wiota	Very limited		Not limited		Very limited	
	Seepage	1.00			Seepage	1.00
	Too clayey	0.50			Too clayey	0.50
41:						
Sparta	Very limited		Very limited		Very limited	
	Too sandy	1.00	Seepage	1.00	Too sandy	1.00
	Seepage	1.00			Seepage	1.00
41B:						
Sparta	Very limited		Very limited		Very limited	
	Too sandy	1.00	Seepage	1.00	Too sandy	1.00
	Seepage	1.00			Seepage	1.00
41C:						
Sparta	Very limited		Very limited		Very limited	
	Too sandy	1.00	Seepage	1.00	Too sandy	1.00
	Seepage	1.00			Seepage	1.00
41D:						
Sparta	Very limited		Very limited		Very limited	
	Too sandy	1.00	Seepage	1.00	Too sandy	1.00
	Seepage	1.00	Slope	0.63	Seepage	1.00
	Slope	0.63			Slope	0.63
63B:						
Chelsea	Very limited		Very limited		Very limited	
	Too sandy	1.00	Seepage	1.00	Too sandy	1.00
	Seepage	1.00			Seepage	1.00
63C:						
Chelsea	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Seepage	1.00
63D:						
Chelsea	Very limited		Very limited		Very limited	
	Too sandy	1.00	Seepage	1.00	Too sandy	1.00
	Seepage	1.00	Slope	0.63	Seepage	1.00
	Slope	0.63			Slope	0.63
83B:						
Kenyon	Very limited		Very limited		Not limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
83C:						
Kenyon	Very limited		Very limited		Not limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		

Table 14b.--Sanitary Facilities--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
83C2:						
Kenyon, moderately eroded	Very limited		Very limited		Not limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
83D2:						
Kenyon, moderately eroded	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope	0.63
	Slope	0.63	Slope	0.63		
84:						
Clyde	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
88:						
Nevin	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	Flooding	0.40	Too clayey	0.50
	Flooding	0.40				
133:						
Colo, occasionally flooded	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				
135:						
Coland, occasionally flooded	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
	Seepage	1.00				
	Too clayey	0.50				
159:						
Finchford	Very limited		Very limited		Very limited	
	Too sandy	1.00	Seepage	1.00	Too sandy	1.00
	Seepage	1.00			Seepage	1.00
159C:						
Finchford	Very limited		Very limited		Very limited	
	Too sandy	1.00	Seepage	1.00	Too sandy	1.00
	Seepage	1.00			Seepage	1.00
					Gravel content	0.01
171B:						
Bassett	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.86

Table 14b.--Sanitary Facilities--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
175:						
Dickinson-----------	Very limited		Very limited		Very limited	
	Too sandy	1.00	Seepage	1.00	Too sandy	1.00
	Seepage	1.00			Seepage	1.00
175B:						
Dickinson-----------	Very limited		Very limited		Very limited	
	Too sandy	1.00	Seepage	1.00	Too sandy	1.00
	Seepage	1.00			Seepage	1.00
177:						
Saude---------------	Very limited		Very limited		Very limited	
	Too sandy	1.00	Seepage	1.00	Too sandy	1.00
	Seepage	1.00			Seepage	1.00
177B:						
Saude---------------	Very limited		Very limited		Very limited	
	Too sandy	1.00	Seepage	1.00	Too sandy	1.00
	Seepage	1.00			Seepage	1.00
178:						
Waukee--------------	Very limited		Very limited		Very limited	
	Too sandy	1.00	Seepage	1.00	Too sandy	1.00
	Seepage	1.00			Seepage	1.00
178B:						
Waukee--------------	Very limited		Very limited		Very limited	
	Too sandy	1.00	Seepage	1.00	Too sandy	1.00
	Seepage	1.00			Seepage	1.00
184:						
Klinger-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
198B:						
Floyd---------------	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		
213B:						
Rockton, 30 to 40 inches to limestone	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
221:						
Klossner------------	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		
284:						
Flagler-------------	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Seepage	1.00
	Too sandy	0.50			Too sandy	0.50

Table 14b.--Sanitary Facilities--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
284B:						
Flagler-------------	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Seepage	1.00
	Too sandy	0.50			Too sandy	0.50
290:						
Dells---------------	Very limited		Very limited		Very limited	
	Too sandy	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	1.00	Too sandy	1.00
	Seepage	1.00			Seepage	1.00
354:						
Aquolls, ponded-----	Not rated		Very limited		Not rated	
			Ponding	1.00		
			Depth to saturated zone	1.00		
377B:						
Dinsdale------------	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
377C:						
Dinsdale------------	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
377C2:						
Dinsdale, moderately eroded------------	Very limited		Very limited		Not limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
382:						
Maxfield------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
391B:						
Clyde---------------	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
Floyd---------------	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		
395B:						
Marquis-------------	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.86
398:						
Tripoli-------------	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 14b.--Sanitary Facilities--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
399:						
Readlyn	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
408B:						
Olin	Not limited		Very limited		Not limited	
			Seepage	1.00		
408C:						
Olin	Not limited		Very limited		Not limited	
			Seepage	1.00		
412C:						
Emeline	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
426B:						
Aredale	Not limited		Very limited		Somewhat limited	
			Seepage	1.00	Seepage	0.50
426C:						
Aredale	Not limited		Very limited		Somewhat limited	
			Seepage	1.00	Seepage	0.50
426C2:						
Aredale, moderately eroded	Not limited		Very limited		Not limited	
			Seepage	1.00		
468B:						
Dunkerton	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
468C:						
Dunkerton	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
471:						
Oran	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
485:						
Spillville, occasionally flooded	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	1.00				

Table 14b.--Sanitary Facilities--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
585:						
Spillville, occasionally flooded	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	1.00				
Coland, occasionally flooded	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
	Seepage	1.00				
	Too clayey	0.50				
626:						
Hayfield, 24 to 40 inches to sand and gravel	Very limited		Very limited		Very limited	
	Too sandy	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	1.00	Too sandy	1.00
	Seepage	1.00			Seepage	1.00
761:						
Franklin	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
771B:						
Waubeek	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
775B:						
Billett	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Seepage	1.00	Seepage	0.50
776C:						
Lilah	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Seepage	1.00
	Too sandy	0.50			Too sandy	0.50
777:						
Wapsie	Very limited		Very limited		Very limited	
	Too sandy	1.00	Seepage	1.00	Too sandy	1.00
	Seepage	1.00			Seepage	1.00
781B:						
Lourdes	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				

Table 14b.--Sanitary Facilities--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
781C2:						
Lourdes, moderately eroded	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				
782B:						
Donnan	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Hard to compact	1.00
	Too clayey	1.00			Depth to saturated zone	1.00
					Too clayey	1.00
798:						
Protivin	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
809B:						
Bertram	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Seepage	1.00	Depth to bedrock	1.00
	Seepage	1.00	Depth to bedrock	1.00	Seepage	0.50
877B:						
Dinsmore	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				
884:						
Klingmore	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
911B:						
Colo	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
Ely	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
933:						
Sawmill, occasionally flooded	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				

Table 14b.--Sanitary Facilities--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
982:						
Maxmore	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Hard to compact	1.00
	Too clayey	0.50			Depth to saturated zone	1.00
					Too clayey	0.50
1152:						
Marshan, 24 to 40 inches to sand and gravel	Very limited		Very limited		Very limited	
	Too sandy	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	1.00	Too sandy	1.00
	Seepage	1.00			Seepage	1.00
1226:						
Lawler, 24 to 40 inches to sand and gravel	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	Seepage	1.00	Seepage	1.00
	Too sandy	0.50			Too sandy	0.50
1285G:						
Burkhardt	Very limited		Very limited		Very limited	
	Too sandy	1.00	Slope	1.00	Slope	1.00
	Slope	1.00	Seepage	1.00	Too sandy	1.00
	Seepage	1.00			Seepage	1.00
					Gravel content	0.03
Bassett	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Slope	1.00	Slope	1.00
	Slope	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.86
Chelsea	Very limited		Very limited		Very limited	
	Too sandy	1.00	Slope	1.00	Slope	1.00
	Slope	1.00	Seepage	1.00	Too sandy	1.00
	Seepage	1.00			Seepage	1.00
1585:						
Spillville, frequently flooded	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	1.00				
Coland, frequently flooded	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
	Seepage	1.00				
	Too clayey	0.50				

Table 14b.--Sanitary Facilities--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
1585:						
Aquolls, ponded-----	Not rated		Very limited		Not rated	
			Ponding	1.00		
			Depth to saturated zone	1.00		
1586:						
Sigglekov, frequently flooded	Very limited		Very limited		Very limited	
	Too sandy	1.00	Flooding	1.00	Depth to saturated zone	1.00
	Flooding	1.00	Depth to saturated zone	1.00	Too sandy	1.00
	Depth to saturated zone	1.00	Seepage	1.00	Seepage	1.00
	Seepage	1.00				
Fluvaquents, frequently flooded	Not rated		Very limited		Not rated	
			Flooding	1.00		
			Depth to saturated zone	1.00		
Aquents, ponded-----	Not rated		Very limited		Not rated	
			Ponding	1.00		
			Depth to saturated zone	1.00		
4000:						
Urban land----------	Not rated		Not rated		Not rated	
4007:						
Wiota---------------	Very limited		Not limited		Very limited	
	Seepage	1.00			Seepage	1.00
	Too clayey	0.50			Too clayey	0.50
Urban land----------	Not rated		Not rated		Not rated	
4041:						
Sparta--------------	Very limited		Very limited		Very limited	
	Too sandy	1.00	Seepage	1.00	Too sandy	1.00
	Seepage	1.00			Seepage	1.00
Urban land----------	Not rated		Not rated		Not rated	
4041B:						
Sparta--------------	Very limited		Very limited		Very limited	
	Too sandy	1.00	Seepage	1.00	Too sandy	1.00
	Seepage	1.00			Seepage	1.00
Urban land----------	Not rated		Not rated		Not rated	
4041C:						
Sparta--------------	Very limited		Very limited		Very limited	
	Too sandy	1.00	Seepage	1.00	Too sandy	1.00
	Seepage	1.00			Seepage	1.00
Urban land----------	Not rated		Not rated		Not rated	

Table 14b.--Sanitary Facilities--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
4041D:						
Sparta	Very limited		Very limited		Very limited	
	Too sandy	1.00	Seepage	1.00	Too sandy	1.00
	Seepage	1.00	Slope	0.63	Seepage	1.00
	Slope	0.63			Slope	0.63
Urban land	Not rated		Not rated		Not rated	
4063B:						
Chelsea	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Seepage	1.00
Urban land	Not rated		Not rated		Not rated	
4063C:						
Chelsea	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Seepage	1.00
Urban land	Not rated		Not rated		Not rated	
4063D:						
Chelsea	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Seepage	1.00
	Slope	0.63	Slope	0.63	Slope	0.63
Urban land	Not rated		Not rated		Not rated	
4083B:						
Kenyon	Very limited		Very limited		Not limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
Urban land	Not rated		Not rated		Not rated	
4083C:						
Kenyon	Very limited		Very limited		Not limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
Urban land	Not rated		Not rated		Not rated	
4083D:						
Kenyon	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope	0.63
	Slope	0.63	Slope	0.63		
Urban land	Not rated		Not rated		Not rated	
4084:						
Clyde	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
Urban land	Not rated		Not rated		Not rated	

Table 14b.--Sanitary Facilities--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
4088:						
Nevin	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	Flooding	0.40	Too clayey	0.50
	Flooding	0.40				
Urban land	Not rated		Not rated		Not rated	
4133:						
Colo, occasionally flooded	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				
Urban land	Not rated		Not rated		Not rated	
4135:						
Coland, occasionally flooded	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
	Seepage	1.00				
	Too clayey	0.50				
Urban land	Not rated		Not rated		Not rated	
4152:						
Marshan, 24 to 40 inches to sand and gravel	Very limited		Very limited		Very limited	
	Too sandy	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	1.00	Too sandy	1.00
	Seepage	1.00			Seepage	1.00
Urban land	Not rated		Not rated		Not rated	
4159:						
Finchford	Very limited		Very limited		Very limited	
	Too sandy	1.00	Seepage	1.00	Too sandy	1.00
	Seepage	1.00			Seepage	1.00
Urban land	Not rated		Not rated		Not rated	
4159C:						
Finchford	Very limited		Very limited		Very limited	
	Too sandy	1.00	Seepage	1.00	Too sandy	1.00
	Seepage	1.00			Seepage	1.00
					Gravel content	0.01
Urban land	Not rated		Not rated		Not rated	
4171B:						
Bassett	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.86

Table 14b.--Sanitary Facilities--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
4171B:						
Urban land	Not rated		Not rated		Not rated	
4171D:						
Bassett	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.86
	Slope	0.63	Slope	0.63	Slope	0.63
Urban land	Not rated		Not rated		Not rated	
4175:						
Dickinson	Very limited		Very limited		Very limited	
	Too sandy	1.00	Seepage	1.00	Too sandy	1.00
	Seepage	1.00			Seepage	1.00
Urban land	Not rated		Not rated		Not rated	
4175B:						
Dickinson	Very limited		Very limited		Very limited	
	Too sandy	1.00	Seepage	1.00	Too sandy	1.00
	Seepage	1.00			Seepage	1.00
Urban land	Not rated		Not rated		Not rated	
4177:						
Saude	Very limited		Very limited		Very limited	
	Too sandy	1.00	Seepage	1.00	Too sandy	1.00
	Seepage	1.00			Seepage	1.00
Urban land	Not rated		Not rated		Not rated	
4177B:						
Saude	Very limited		Very limited		Very limited	
	Too sandy	1.00	Seepage	1.00	Too sandy	1.00
	Seepage	1.00			Seepage	1.00
Urban land	Not rated		Not rated		Not rated	
4178:						
Waukee	Very limited		Very limited		Very limited	
	Too sandy	1.00	Seepage	1.00	Too sandy	1.00
	Seepage	1.00			Seepage	1.00
Urban land	Not rated		Not rated		Not rated	
4184:						
Klinger	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Urban land	Not rated		Not rated		Not rated	
4198B:						
Floyd	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		
Urban land	Not rated		Not rated		Not rated	

Table 14b.--Sanitary Facilities--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
4226:						
Lawler, 24 to 40 inches to sand and gravel	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	Seepage	1.00	Seepage	1.00
	Too sandy	0.50			Too sandy	0.50
Urban land	Not rated		Not rated		Not rated	
4284:						
Flagler	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Seepage	1.00
	Too sandy	0.50			Too sandy	0.50
Urban land	Not rated		Not rated		Not rated	
4284B:						
Flagler	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Seepage	1.00
	Too sandy	0.50			Too sandy	0.50
Urban land	Not rated		Not rated		Not rated	
4377B:						
Dinsdale	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
Urban land	Not rated		Not rated		Not rated	
4377C:						
Dinsdale	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
Urban land	Not rated		Not rated		Not rated	
4382:						
Maxfield	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Urban land	Not rated		Not rated		Not rated	
4391B:						
Clyde	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
Floyd	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		
Urban land	Not rated		Not rated		Not rated	

Table 14b.--Sanitary Facilities--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
4398:						
Tripoli	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Urban land	Not rated		Not rated		Not rated	
4399:						
Readlyn	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Urban land	Not rated		Not rated		Not rated	
4408B:						
Olin	Not limited		Very limited		Not limited	
			Seepage	1.00		
Urban land	Not rated		Not rated		Not rated	
4408C:						
Olin	Not limited		Very limited		Not limited	
			Seepage	1.00		
Urban land	Not rated		Not rated		Not rated	
4426B:						
Aredale	Not limited		Very limited		Somewhat limited	
			Seepage	1.00	Seepage	0.50
Urban land	Not rated		Not rated		Not rated	
4426C:						
Aredale	Not limited		Very limited		Somewhat limited	
			Seepage	1.00	Seepage	0.50
Urban land	Not rated		Not rated		Not rated	
4585:						
Spillville, occasionally flooded	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	1.00				
Coland, occasionally flooded	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
	Seepage	1.00				
	Too clayey	0.50				
Urban land	Not rated		Not rated		Not rated	

Table 14b.--Sanitary Facilities--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
4761:						
Franklin	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Urban land	Not rated		Not rated		Not rated	
4771B:						
Waubeek	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
Urban land	Not rated		Not rated		Not rated	
4771D:						
Waubeek	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
					Slope	0.04
	Slope	0.04	Slope	0.04		
Urban land	Not rated		Not rated		Not rated	
4798:						
Protivin	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
Urban land	Not rated		Not rated		Not rated	
4911B:						
Colo	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				
Ely	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
Urban land	Not rated		Not rated		Not rated	
4933:						
Sawmill, occasionally flooded	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				
Urban land	Not rated		Not rated		Not rated	
4946:						
Orthents, loamy	Not rated		Not rated		Not rated	
Urban land	Not rated		Not rated		Not rated	

Table 14b.--Sanitary Facilities--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
5010:						
Pits, sand and gravel	Not rated		Not rated		Not rated	
5030:						
Pits, limestone quarries	Not rated		Not rated		Not rated	
5040:						
Orthents, loamy	Not rated		Not rated		Not rated	
5053:						
Psammaquents, frequently flooded	Not rated		Very limited		Not rated	
			Flooding	1.00		
			Depth to saturated zone	1.00		
5080:						
Orthents, sanitary landfill	Not rated		Not rated		Not rated	
AW:						
Animal waste	Not rated		Not rated		Not rated	
SL:						
Sewage lagoon	Not rated		Not rated		Not rated	
W:						
Water	Not rated		Not rated		Not rated	

Table 15a.--Construction Materials

(The information in this table indicates the dominant condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The larger the value, the greater the likelihood that the soil is a source of the material. "Not rated" indicates that data are not available or that no rating is applicable. See text for further explanation of ratings in this table)

Map symbol and soil name	Potential as source of gravel		Potential as source of sand	
	Rating class	Value	Rating class	Value
7:				
Wiota	Improbable		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.10
41:				
Sparta	Improbable		Fair	
	Thickest layer	0.00	Thickest layer	0.27
	Bottom layer	0.00	Bottom layer	0.35
41B:				
Sparta	Improbable		Fair	
	Thickest layer	0.00	Thickest layer	0.27
	Bottom layer	0.00	Bottom layer	0.35
41C:				
Sparta	Improbable		Fair	
	Thickest layer	0.00	Thickest layer	0.27
	Bottom layer	0.00	Bottom layer	0.35
41D:				
Sparta	Improbable		Fair	
	Thickest layer	0.00	Thickest layer	0.27
	Bottom layer	0.00	Bottom layer	0.35
63B:				
Chelsea	Improbable		Fair	
	Thickest layer	0.00	Bottom layer	0.12
	Bottom layer	0.00	Thickest layer	0.12
63C:				
Chelsea	Improbable		Fair	
	Thickest layer	0.00	Bottom layer	0.12
	Bottom layer	0.00	Thickest layer	0.12
63D:				
Chelsea	Improbable		Fair	
	Thickest layer	0.00	Bottom layer	0.12
	Bottom layer	0.00	Thickest layer	0.12
83B:				
Kenyon	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
83C:				
Kenyon	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00

Table 15a.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel: Rating class	Value	Potential as source of sand: Rating class	Value
83C2:				
Kenyon, moderately eroded	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
83D2:				
Kenyon, moderately eroded	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
84:				
Clyde	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
88:				
Nevin	Improbable		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.42
133:				
Colo, occasionally flooded	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
135:				
Coland, occasionally flooded	Improbable		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.03
159:				
Finchford	Possible		Fair	
	Thickest layer	0.08	Bottom layer	0.46
	Bottom layer	0.08	Thickest layer	0.46
159C:				
Finchford	Possible		Fair	
	Thickest layer	0.08	Thickest layer	0.44
	Bottom layer	0.08	Bottom layer	0.46
171B:				
Bassett	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
175:				
Dickinson	Improbable		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.36
175B:				
Dickinson	Improbable		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.36

Table 15a.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel		Potential as source of sand	
	Rating class	Value	Rating class	Value
177:				
Saude---------------	Possible		Fair	
	Thickest layer	0.00	Thickest layer	0.08
	Bottom layer	0.04	Bottom layer	0.60
177B:				
Saude---------------	Possible		Fair	
	Thickest layer	0.00	Thickest layer	0.08
	Bottom layer	0.04	Bottom layer	0.60
178:				
Waukee--------------	Possible		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.04	Bottom layer	0.67
178B:				
Waukee--------------	Possible		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.04	Bottom layer	0.67
184:				
Klinger-------------	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
198B:				
Floyd---------------	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
213B:				
Rockton, 30 to 40 inches to limestone	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
221:				
Klossner------------	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
284:				
Flagler-------------	Improbable		Poor	
	Thickest layer	0.00	Thickest layer	0.04
	Bottom layer	0.00	Bottom layer	0.08
284B:				
Flagler-------------	Improbable		Poor	
	Thickest layer	0.00	Thickest layer	0.04
	Bottom layer	0.00	Bottom layer	0.08
290:				
Dells---------------	Improbable		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.67
354:				
Aquolls, ponded-----	Not rated		Not rated	

Table 15a.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel		Potential as source of sand	
	Rating class	Value	Rating class	Value
377B:				
Dinsdale	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
377C:				
Dinsdale	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
377C2:				
Dinsdale, moderately eroded	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
382:				
Maxfield	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
391B:				
Clyde	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
Floyd	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
395B:				
Marquis	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
398:				
Tripoli	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
399:				
Readlyn	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
408B:				
Olin	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
408C:				
Olin	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
412C:				
Emeline	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00

Table 15a.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel		Potential as source of sand	
	Rating class	Value	Rating class	Value
426B:				
Aredale-------------	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.02
426C:				
Aredale-------------	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.02
426C2:				
Aredale, moderately eroded-------------	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
468B:				
Dunkerton-----------	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
468C:				
Dunkerton-----------	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
471:				
Oran----------------	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
485:				
Spillville, occasionally flooded------------	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
585:				
Spillville, occasionally flooded------------	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
Coland, occasionally flooded------------	Improbable		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.03
626:				
Hayfield, 24 to 40 inches to sand and gravel-------------	Improbable		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.54
761:				
Franklin------------	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00

Table 15a.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel: Rating class	Value	Potential as source of sand: Rating class	Value
771B:				
Waubeek	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
775B:				
Billett	Improbable		Poor	
	Thickest layer	0.00	Thickest layer	0.04
	Bottom layer	0.00	Bottom layer	0.08
776C:				
Lilah	Possible		Fair	
	Bottom layer	0.00	Bottom layer	0.08
	Thickest layer	0.04	Thickest layer	0.11
777:				
Wapsie	Possible		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.04	Bottom layer	0.41
781B:				
Lourdes	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
781C2:				
Lourdes, moderately eroded	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
782B:				
Donnan	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
798:				
Protivin	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
809B:				
Bertram	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.03
	Bottom layer	0.00	Thickest layer	0.03
877B:				
Dinsmore	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
884:				
Klingmore	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
911B:				
Colo	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00

Table 15a.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel		Potential as source of sand	
	Rating class	Value	Rating class	Value
911B:				
Ely-----------------	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
933:				
Sawmill, occasionally flooded------------	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
982:				
Maxmore-------------	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
1152:				
Marshan, 24 to 40 inches to sand and gravel-------------	Possible		Fair	
	Thickest layer	0.00	Thickest layer	0.29
	Bottom layer	0.04	Bottom layer	0.82
1226:				
Lawler, 24 to 40 inches to sand and gravel-------------	Possible		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.04	Bottom layer	0.08
1285G:				
Burkhardt-----------	Possible		Fair	
	Thickest layer	0.00	Thickest layer	0.03
	Bottom layer	0.12	Bottom layer	0.87
Bassett-------------	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
Chelsea-------------	Improbable		Fair	
	Thickest layer	0.00	Thickest layer	0.12
	Bottom layer	0.00	Bottom layer	0.19
1585:				
Spillville, frequently flooded	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
Coland, frequently flooded------------	Improbable		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.03
Aquolls, ponded-----	Not rated		Not rated	

Table 15a.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel: Rating class	Value	Potential as source of sand: Rating class	Value
1586:				
Sigglekov, frequently flooded	Improbable		Fair	
	Thickest layer	0.00	Thickest layer	0.41
	Bottom layer	0.00	Bottom layer	0.52
Fluvaquents, frequently flooded	Not rated		Not rated	
Aquents, ponded-----	Not rated		Not rated	
4000:				
Urban land----------	Not rated		Not rated	
4007:				
Wiota---------------	Improbable		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.10
Urban land----------	Not rated		Not rated	
4041:				
Sparta--------------	Improbable		Fair	
	Thickest layer	0.00	Thickest layer	0.27
	Bottom layer	0.00	Bottom layer	0.35
Urban land----------	Not rated		Not rated	
4041B:				
Sparta--------------	Improbable		Fair	
	Thickest layer	0.00	Thickest layer	0.27
	Bottom layer	0.00	Bottom layer	0.35
Urban land----------	Not rated		Not rated	
4041C:				
Sparta--------------	Improbable		Fair	
	Thickest layer	0.00	Thickest layer	0.27
	Bottom layer	0.00	Bottom layer	0.35
Urban land----------	Not rated		Not rated	
4041D:				
Sparta--------------	Improbable		Fair	
	Thickest layer	0.00	Thickest layer	0.27
	Bottom layer	0.00	Bottom layer	0.35
Urban land----------	Not rated		Not rated	
4063B:				
Chelsea-------------	Improbable		Fair	
	Thickest layer	0.00	Bottom layer	0.12
	Bottom layer	0.00	Thickest layer	0.12
Urban land----------	Not rated		Not rated	
4063C:				
Chelsea-------------	Improbable		Fair	
	Thickest layer	0.00	Bottom layer	0.12
	Bottom layer	0.00	Thickest layer	0.12

Table 15a.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel		Potential as source of sand	
	Rating class	Value	Rating class	Value
4063C:				
Urban land	Not rated		Not rated	
4063D:				
Chelsea	Improbable		Fair	
	Thickest layer	0.00	Bottom layer	0.12
	Bottom layer	0.00	Thickest layer	0.12
Urban land	Not rated		Not rated	
4083B:				
Kenyon	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
Urban land	Not rated		Not rated	
4083C:				
Kenyon	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
Urban land	Not rated		Not rated	
4083D:				
Kenyon	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
Urban land	Not rated		Not rated	
4084:				
Clyde	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
Urban land	Not rated		Not rated	
4088:				
Nevin	Improbable		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.42
Urban land	Not rated		Not rated	
4133:				
Colo, occasionally flooded	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
Urban land	Not rated		Not rated	
4135:				
Coland, occasionally flooded	Improbable		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.03
Urban land	Not rated		Not rated	

Table 15a.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel		Potential as source of sand	
	Rating class	Value	Rating class	Value
4152:				
Marshan, 24 to 40 inches to sand and gravel	Possible		Fair	
	Thickest layer	0.00	Thickest layer	0.29
	Bottom layer	0.04	Bottom layer	0.82
Urban land	Not rated		Not rated	
4159:				
Finchford	Possible		Fair	
	Thickest layer	0.08	Bottom layer	0.46
	Bottom layer	0.08	Thickest layer	0.46
Urban land	Not rated		Not rated	
4159C:				
Finchford	Possible		Fair	
	Thickest layer	0.08	Thickest layer	0.44
	Bottom layer	0.08	Bottom layer	0.46
Urban land	Not rated		Not rated	
4171B:				
Bassett	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
Urban land	Not rated		Not rated	
4171D:				
Bassett	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
Urban land	Not rated		Not rated	
4175:				
Dickinson	Improbable		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.36
Urban land	Not rated		Not rated	
4175B:				
Dickinson	Improbable		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.36
Urban land	Not rated		Not rated	
4177:				
Saude	Possible		Fair	
	Thickest layer	0.00	Thickest layer	0.08
	Bottom layer	0.04	Bottom layer	0.60
Urban land	Not rated		Not rated	

Table 15a.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel		Potential as source of sand	
	Rating class	Value	Rating class	Value
4177B:				
Saude---------------	Possible		Fair	
	Thickest layer	0.00	Thickest layer	0.08
	Bottom layer	0.04	Bottom layer	0.60
Urban land----------	Not rated		Not rated	
4178:				
Waukee--------------	Possible		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.04	Bottom layer	0.67
Urban land----------	Not rated		Not rated	
4184:				
Klinger-------------	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
Urban land----------	Not rated		Not rated	
4198B:				
Floyd---------------	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
Urban land----------	Not rated		Not rated	
4226:				
Lawler, 24 to 40 inches to sand and gravel------------	Possible		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.04	Bottom layer	0.08
Urban land----------	Not rated		Not rated	
4284:				
Flagler-------------	Improbable		Poor	
	Thickest layer	0.00	Thickest layer	0.04
	Bottom layer	0.00	Bottom layer	0.08
Urban land----------	Not rated		Not rated	
4284B:				
Flagler-------------	Improbable		Poor	
	Thickest layer	0.00	Thickest layer	0.04
	Bottom layer	0.00	Bottom layer	0.08
Urban land----------	Not rated		Not rated	
4377B:				
Dinsdale------------	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
Urban land----------	Not rated		Not rated	

Table 15a.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel		Potential as source of sand	
	Rating class	Value	Rating class	Value
4377C:				
Dinsdale------------	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
Urban land----------	Not rated		Not rated	
4382:				
Maxfield------------	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
Urban land----------	Not rated		Not rated	
4391B:				
Clyde---------------	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
Floyd---------------	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
Urban land----------	Not rated		Not rated	
4398:				
Tripoli-------------	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
Urban land----------	Not rated		Not rated	
4399:				
Readlyn-------------	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
Urban land----------	Not rated		Not rated	
4408B:				
Olin----------------	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
Urban land----------	Not rated		Not rated	
4408C:				
Olin----------------	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
Urban land----------	Not rated		Not rated	
4426B:				
Aredale-------------	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.02
Urban land----------	Not rated		Not rated	

Table 15a.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel		Potential as source of sand	
	Rating class	Value	Rating class	Value
4426C:				
Aredale	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.02
Urban land	Not rated		Not rated	
4585:				
Spillville, occasionally flooded	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
Coland, occasionally flooded	Improbable		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.03
Urban land	Not rated		Not rated	
4761:				
Franklin	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
Urban land	Not rated		Not rated	
4771B:				
Waubeek	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
Urban land	Not rated		Not rated	
4771D:				
Waubeek	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
Urban land	Not rated		Not rated	
4798:				
Protivin	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
Urban land	Not rated		Not rated	
4911B:				
Colo	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
Ely	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
Urban land	Not rated		Not rated	

Table 15a.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel: Rating class	Value	Potential as source of sand: Rating class	Value
4933:				
Sawmill, occasionally flooded	Improbable		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.00	Thickest layer	0.00
Urban land	Not rated		Not rated	
4946:				
Orthents, loamy	Not rated		Not rated	
Urban land	Not rated		Not rated	
5010:				
Pits, sand and gravel	Not rated		Not rated	
5030:				
Pits, limestone quarries	Not rated		Not rated	
5040:				
Orthents, loamy	Not rated		Not rated	
5053:				
Psammaquents, frequently flooded	Not rated		Not rated	
5080:				
Orthents, sanitary landfill	Not rated		Not rated	
AW:				
Animal waste	Not rated		Not rated	
SL:				
Sewage lagoon	Not rated		Not rated	
W:				
Water	Not rated		Not rated	

Table 15b.--Construction Materials

(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. "Not rated" indicates that data are not available or that no rating is applicable. See text for further explanation of ratings in this table)

Map symbol and soil name	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
7:						
Wiota	Fair		Fair		Good	
	Low content of organic matter	0.88	Shrink-swell	0.99		
	Water erosion	0.90				
	Too acid	0.92				
41:						
Sparta	Poor		Good		Poor	
	Too sandy	0.00			Too sandy	0.00
	Wind erosion	0.00				
	Low content of organic matter	0.12				
	Droughty	0.68				
	Too acid	0.68				
41B:						
Sparta	Poor		Good		Poor	
	Too sandy	0.00			Too sandy	0.00
	Wind erosion	0.00				
	Low content of organic matter	0.12				
	Droughty	0.68				
	Too acid	0.68				
41C:						
Sparta	Poor		Good		Poor	
	Too sandy	0.00			Too sandy	0.00
	Wind erosion	0.00				
	Low content of organic matter	0.12				
	Droughty	0.64				
	Too acid	0.68				
41D:						
Sparta	Poor		Good		Poor	
	Too sandy	0.00			Too sandy	0.00
	Wind erosion	0.00			Slope	0.37
	Low content of organic matter	0.12				
	Droughty	0.62				
	Too acid	0.68				
63B:						
Chelsea	Poor		Good		Poor	
	Too sandy	0.00			Too sandy	0.00
	Wind erosion	0.00				
	Low content of organic matter	0.12				
	Too acid	0.84				
	Droughty	0.94				

Table 15b.--Construction Materials

Map symbol and soil name	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
63C:						
Chelsea	Poor		Good		Poor	
	Too sandy	0.00			Too sandy	0.00
	Wind erosion	0.00				
	Low content of organic matter	0.12				
	Too acid	0.84				
	Droughty	0.94				
63D:						
Chelsea	Poor		Good		Poor	
	Too sandy	0.00			Too sandy	0.00
	Wind erosion	0.00			Slope	0.37
	Low content of organic matter	0.12				
	Too acid	0.84				
	Droughty	0.94				
83B:						
Kenyon	Fair		Fair		Good	
	Low content of organic matter	0.50	Low strength	0.78		
	Too acid	0.97				
83C:						
Kenyon	Fair		Fair		Good	
	Low content of organic matter	0.50	Low strength	0.78		
	Too acid	0.97				
83C2:						
Kenyon, moderately eroded	Fair		Good		Good	
	Low content of organic matter	0.50				
	Too acid	0.97				
83D2:						
Kenyon, moderately eroded	Fair		Good		Fair	
	Low content of organic matter	0.50			Slope	0.37
	Too acid	0.97				
84:						
Clyde	Fair		Poor		Poor	
	Water erosion	0.99	Depth to saturated zone	0.00	Depth to saturated zone	0.00
			Low strength	0.22		
			Shrink-swell	0.99		
88:						
Nevin	Fair		Poor		Fair	
	Too acid	0.99	Depth to saturated zone	0.00	Depth to saturated zone	0.50
			Shrink-swell	0.94		

Table 15b.--Construction Materials

Map symbol and soil name	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
133:						
Colo, occasionally flooded	Fair		Poor		Poor	
	Too clayey	0.98	Depth to saturated zone	0.00	Depth to saturated zone	0.00
			Low strength	0.00	Too clayey	0.00
			Shrink-swell	0.90		
135:						
Coland, occasionally flooded	Fair		Poor		Poor	
	Too clayey	0.98	Depth to saturated zone	0.00	Depth to saturated zone	0.00
			Low strength	0.00	Too clayey	0.00
159:						
Finchford	Poor		Good		Poor	
	Too sandy	0.00			Too sandy	0.00
	Wind erosion	0.00			Hard to reclaim	0.68
	Low content of organic matter	0.12				
	Droughty	0.29				
	Too acid	0.74				
159C:						
Finchford	Poor		Good		Poor	
	Too sandy	0.00			Too sandy	0.00
	Wind erosion	0.00			Rock fragments	0.00
	Low content of organic matter	0.12			Hard to reclaim	0.68
	Droughty	0.17				
	Too acid	0.74				
171B:						
Bassett	Fair		Fair		Good	
	Low content of organic matter	0.12	Depth to saturated zone	0.53		
	Too acid	0.88	Low strength	0.78		
175:						
Dickinson	Fair		Good		Good	
	Low content of organic matter	0.12				
	Too acid	0.84				
	Droughty	0.95				
175B:						
Dickinson	Fair		Good		Good	
	Low content of organic matter	0.12				
	Too acid	0.84				
	Droughty	0.95				
177:						
Saude	Fair		Good		Fair	
	Low content of organic matter	0.12			Hard to reclaim	0.82
	Too acid	0.74				

Table 15b.--Construction Materials

Map symbol and soil name	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
177B:						
Saude	Fair		Good		Fair	
	Low content of organic matter	0.12			Hard to reclaim	0.82
	Too acid	0.74				
178:						
Waukee	Fair		Good		Good	
	Low content of organic matter	0.12			Hard to reclaim	0.98
	Too acid	0.74				
178B:						
Waukee	Fair		Good		Good	
	Low content of organic matter	0.12			Hard to reclaim	0.98
	Too acid	0.74				
184:						
Klinger	Fair		Poor		Fair	
	Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.50
	Too acid	0.84	Low strength	0.78		
	Water erosion	0.90				
198B:						
Floyd	Good		Poor		Fair	
			Depth to saturated zone	0.00	Depth to saturated zone	0.50
213B:						
Rockton, 30 to 40 inches to limestone	Fair		Poor		Good	
	Too acid	0.84	Depth to bedrock	0.00	Depth to bedrock	0.90
	Depth to bedrock	0.90	Low strength	0.78		
			Shrink-swell	0.88		
221:						
Klossner	Poor		Poor		Poor	
	Wind erosion	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Too acid	0.97			Content of organic matter	0.00
	Water erosion	0.99				
284:						
Flagler	Fair		Good		Good	
	Low content of organic matter	0.12				
	Too acid	0.84				
	Droughty	0.87				
284B:						
Flagler	Fair		Good		Good	
	Low content of organic matter	0.12				
	Too acid	0.84				
	Droughty	0.87				

Table 15b.--Construction Materials

Map symbol and soil name	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
290:						
Dells	Fair		Poor		Fair	
	Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.50
	Too acid	0.97				
	Water erosion	0.99				
354:						
Aquolls, ponded	Not rated		Not rated		Not rated	
377B:						
Dinsdale	Fair		Fair		Poor	
	Low content of organic matter	0.12	Low strength	0.78	Too clayey	0.00
			Shrink-swell	0.99		
	Water erosion	0.90				
	Too clayey	0.92				
	Too acid	0.97				
377C:						
Dinsdale	Fair		Fair		Poor	
	Low content of organic matter	0.12	Low strength	0.78	Too clayey	0.00
			Shrink-swell	0.99		
	Water erosion	0.90				
	Too clayey	0.92				
	Too acid	0.97				
377C2:						
Dinsdale, moderately eroded	Fair		Fair		Poor	
	Low content of organic matter	0.12	Low strength	0.78	Too clayey	0.00
	Water erosion	0.90				
	Too clayey	0.92				
	Too acid	0.97				
382:						
Maxfield	Fair		Poor		Poor	
	Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Too clayey	0.98	Low strength	0.78	Too clayey	0.00
391B:						
Clyde	Fair		Poor		Poor	
	Water erosion	0.99	Depth to saturated zone	0.00	Depth to saturated zone	0.00
			Low strength	0.22		
			Shrink-swell	0.99		
Floyd	Good		Poor		Fair	
			Depth to saturated zone	0.00	Depth to saturated zone	0.50
395B:						
Marquis	Fair		Fair		Good	
	Low content of organic matter	0.50	Depth to saturated zone	0.53		
	Too acid	0.97				
	Water erosion	0.99				

Table 15b.--Construction Materials

Map symbol and soil name	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
398:						
Tripoli	Fair		Poor		Poor	
	Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.00
399:						
Readlyn	Fair		Poor		Fair	
	Too acid	0.84	Depth to saturated zone	0.00	Depth to saturated zone	0.50
408B:						
Olin	Fair		Good		Good	
	Low content of organic matter	0.12				
	Too acid	0.74				
	Water erosion	0.99				
408C:						
Olin	Fair		Good		Good	
	Low content of organic matter	0.12				
	Too acid	0.74				
	Water erosion	0.99				
412C:						
Emeline	Poor		Poor		Poor	
	Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
	Depth to bedrock	0.00	Low strength	0.00		
426B:						
Aredale	Fair		Good		Good	
	Low content of organic matter	0.12				
	Too acid	0.74				
426C:						
Aredale	Fair		Good		Good	
	Low content of organic matter	0.12				
	Too acid	0.74				
426C2:						
Aredale, moderately eroded	Fair		Fair		Good	
	Too acid	0.74	Low strength	0.78		
	Low content of organic matter	0.88				
468B:						
Dunkerton	Fair		Poor		Fair	
	Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.50
	Too acid	0.97				
	Water erosion	0.99				
468C:						
Dunkerton	Fair		Poor		Fair	
	Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.50
	Too acid	0.97				
	Water erosion	0.99				

Table 15b.--Construction Materials

Map symbol and soil name	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
471:						
Oran	Fair		Poor		Fair	
	Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.50
	Too acid	0.84	Low strength	0.78	Rock fragments	0.97
	Water erosion	0.99				
485:						
Spillville, occasionally flooded	Good		Poor		Fair	
			Depth to saturated zone	0.00	Depth to saturated zone	0.50
			Low strength	0.00		
585:						
Spillville, occasionally flooded	Good		Poor		Fair	
			Depth to saturated zone	0.00	Depth to saturated zone	0.50
			Low strength	0.00		
Coland, occasionally flooded	Fair		Poor		Poor	
	Too clayey	0.98	Depth to saturated zone	0.00	Depth to saturated zone	0.00
			Low strength	0.00	Too clayey	0.00
626:						
Hayfield, 24 to 40 inches to sand and gravel	Fair		Poor		Fair	
	Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.50
	Too acid	0.74				
761:						
Franklin	Fair		Poor		Poor	
	Low content of organic matter	0.12	Depth to saturated zone	0.00	Too clayey	0.00
	Too acid	0.74	Low strength	0.78	Depth to saturated zone	0.50
	Too clayey	0.92				
	Water erosion	0.99				
771B:						
Waubeek	Fair		Good		Good	
	Low content of organic matter	0.12				
	Too acid	0.74				
	Water erosion	0.99				
775B:						
Billett	Fair		Good		Poor	
	Low content of organic matter	0.12			Hard to reclaim	0.00
	Too acid	0.84				

Table 15b.--Construction Materials

Map symbol and soil name	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
776C:						
Lilah----------------	Poor		Good		Poor	
	Too sandy	0.00			Too sandy	0.00
	Droughty	0.00			Rock fragments	0.00
	Low content of organic matter	0.12			Too acid	0.98
	Too acid	0.54				
777:						
Wapsie---------------	Fair		Good		Good	
	Low content of organic matter	0.12			Rock fragments	0.97
					Hard to reclaim	0.98
	Too acid	0.84				
781B:						
Lourdes--------------	Fair		Poor		Poor	
	Low content of organic matter	0.12	Low strength	0.00	Too clayey	0.00
			Shrink-swell	0.93		
	Too acid	0.32				
	Too clayey	0.98				
	Water erosion	0.99				
781C2:						
Lourdes, moderately eroded--------------	Fair		Poor		Poor	
	Low content of organic matter	0.12	Low strength	0.00	Too clayey	0.00
			Shrink-swell	0.91		
	Too acid	0.88				
	Too clayey	0.98				
	Water erosion	0.99				
782B:						
Donnan---------------	Poor		Poor		Poor	
	Too clayey	0.00	Depth to saturated zone	0.00	Too clayey	0.00
	Low content of organic matter	0.12			Depth to saturated zone	0.50
			Low strength	0.00		
	Too acid	0.54	Shrink-swell	0.41		
798:						
Protivin-------------	Fair		Poor		Poor	
	Low content of organic matter	0.12	Depth to saturated zone	0.00	Too clayey	0.00
					Depth to saturated zone	0.50
	Too acid	0.74	Low strength	0.00		
	Too clayey	0.98	Shrink-swell	0.97		
	Water erosion	0.99				
809B:						
Bertram--------------	Fair		Poor		Fair	
	Droughty	0.15	Depth to bedrock	0.00	Depth to bedrock	0.54
	Depth to bedrock	0.54				
	Too acid	0.74				
	Low content of organic matter	0.88				
877B:						
Dinsmore-------------	Fair		Fair		Poor	
	Too acid	0.74	Low strength	0.78	Too clayey	0.00
	Too clayey	0.98	Shrink-swell	0.96		
	Water erosion	0.99				

Table 15b.--Construction Materials

Map symbol and soil name	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
884:						
Klingmore-----------	Fair		Poor		Poor	
	Too acid	0.84	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	0.50
	Too clayey	0.98	Shrink-swell	0.92		
	Water erosion	0.99				
911B:						
Colo----------------	Fair		Poor		Poor	
	Too clayey	0.98	Depth to saturated zone	0.00	Depth to saturated zone	0.00
			Low strength	0.00	Too clayey	0.00
			Shrink-swell	0.90		
Ely-----------------	Fair		Poor		Fair	
	Water erosion	0.90	Depth to saturated zone	0.00	Depth to saturated zone	0.50
			Low strength	0.00		
			Shrink-swell	0.99		
933:						
Sawmill, occasionally flooded-----------	Fair		Poor		Poor	
	Too clayey	0.98	Depth to saturated zone	0.00	Depth to saturated zone	0.00
			Low strength	0.00	Too clayey	0.00
			Shrink-swell	0.90		
982:						
Maxmore-------------	Fair		Poor		Poor	
	Too clayey	0.92	Depth to saturated zone	0.00	Depth to saturated zone	0.00
			Low strength	0.78	Too clayey	0.00
			Shrink-swell	0.90		
1152:						
Marshan, 24 to 40 inches to sand and gravel-------------	Fair		Poor		Poor	
	Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.00
					Hard to reclaim	0.92
1226:						
Lawler, 24 to 40 inches to sand and gravel-------------	Fair		Poor		Fair	
	Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.50
	Too acid	0.84			Hard to reclaim	0.82
1285G:						
Burkhardt-----------	Poor		Poor		Poor	
	Too sandy	0.00	Slope	0.00	Slope	0.00
	Low content of organic matter	0.12			Too sandy	0.00
	Droughty	0.28			Rock fragments	0.00
	Too acid	0.74			Hard to reclaim	0.68

Table 15b.--Construction Materials

Map symbol and soil name	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
1285G:						
Bassett	Fair		Poor		Poor	
	Low content of organic matter	0.12	Slope	0.00	Slope	0.00
	Too acid	0.88	Depth to saturated zone	0.53		
			Low strength	0.78		
Chelsea	Poor		Poor		Poor	
	Too sandy	0.00	Slope	0.00	Slope	0.00
	Wind erosion	0.00			Too sandy	0.00
	Low content of organic matter	0.12				
	Too acid	0.84				
	Droughty	0.87				
1585:						
Spillville, frequently flooded	Good		Poor		Fair	
			Depth to saturated zone	0.00	Depth to saturated zone	0.50
			Low strength	0.00		
Coland, frequently flooded	Fair		Poor		Poor	
	Too clayey	0.98	Depth to saturated zone	0.00	Depth to saturated zone	0.00
			Low strength	0.00	Too clayey	0.00
Aquolls, ponded	Not rated		Not rated		Not rated	
1586:						
Sigglekov, frequently flooded	Poor		Poor		Poor	
	Too sandy	0.00	Depth to saturated zone	0.00	Too sandy	0.00
	Droughty	0.04			Depth to saturated zone	0.50
	Low content of organic matter	0.12				
	Too acid	0.95				
Fluvaquents, frequently flooded	Not rated		Not rated		Not rated	
Aquents, ponded	Not rated		Not rated		Not rated	
4000:						
Urban land	Not rated		Not rated		Not rated	
4007:						
Wiota	Fair		Fair		Good	
	Low content of organic matter	0.88	Shrink-swell	0.94		
	Water erosion	0.90				
	Too acid	0.92				
Urban land	Not rated		Not rated		Not rated	

Table 15b.--Construction Materials

Map symbol and soil name	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
4041:						
Sparta--------------	Poor		Good		Poor	
	Too sandy	0.00			Too sandy	0.00
	Wind erosion	0.00				
	Low content of organic matter	0.12				
	Droughty	0.68				
	Too acid	0.68				
Urban land----------	Not rated		Not rated		Not rated	
4041B:						
Sparta--------------	Poor		Good		Poor	
	Too sandy	0.00			Too sandy	0.00
	Wind erosion	0.00				
	Low content of organic matter	0.12				
	Droughty	0.68				
	Too acid	0.68				
Urban land----------	Not rated		Not rated		Not rated	
4041C:						
Sparta--------------	Poor		Good		Poor	
	Too sandy	0.00			Too sandy	0.00
	Wind erosion	0.00				
	Low content of organic matter	0.12				
	Droughty	0.64				
	Too acid	0.68				
Urban land----------	Not rated		Not rated		Not rated	
4041D:						
Sparta--------------	Poor		Good		Poor	
	Too sandy	0.00			Too sandy	0.00
	Wind erosion	0.00			Slope	0.37
	Low content of organic matter	0.12				
	Droughty	0.62				
	Too acid	0.68				
Urban land----------	Not rated		Not rated		Not rated	
4063B:						
Chelsea-------------	Poor		Good		Poor	
	Too sandy	0.00			Too sandy	0.00
	Wind erosion	0.00				
	Low content of organic matter	0.12				
	Too acid	0.84				
	Droughty	0.94				
Urban land----------	Not rated		Not rated		Not rated	

Table 15b.--Construction Materials

Map symbol and soil name	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
4063C:						
Chelsea	Poor		Good		Poor	
	Too sandy	0.00			Too sandy	0.00
	Wind erosion	0.00				
	Low content of organic matter	0.12				
	Too acid	0.84				
	Droughty	0.94				
Urban land	Not rated		Not rated		Not rated	
4063D:						
Chelsea	Poor		Good		Poor	
	Too sandy	0.00			Too sandy	0.00
	Wind erosion	0.00			Slope	0.37
	Low content of organic matter	0.12				
	Too acid	0.84				
	Droughty	0.94				
Urban land	Not rated		Not rated		Not rated	
4083B:						
Kenyon	Fair		Fair		Good	
	Low content of organic matter	0.50	Low strength	0.78		
	Too acid	0.97				
Urban land	Not rated		Not rated		Not rated	
4083C:						
Kenyon	Fair		Fair		Good	
	Low content of organic matter	0.50	Low strength	0.78		
	Too acid	0.97				
Urban land	Not rated		Not rated		Not rated	
4083D:						
Kenyon	Fair		Fair		Fair	
	Low content of organic matter	0.50	Low strength	0.78	Slope	0.37
	Too acid	0.97				
Urban land	Not rated		Not rated		Not rated	
4084:						
Clyde	Fair		Poor		Poor	
	Water erosion	0.99	Depth to saturated zone	0.00	Depth to saturated zone	0.00
			Low strength	0.22		
			Shrink-swell	0.99		
Urban land	Not rated		Not rated		Not rated	
4088:						
Nevin	Fair		Poor		Fair	
	Too acid	0.99	Depth to saturated zone	0.00	Depth to saturated zone	0.50
			Shrink-swell	0.92		

Table 15b.--Construction Materials

Map symbol and soil name	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
4088:						
Urban land----------	Not rated		Not rated		Not rated	
4133:						
Colo, occasionally flooded-----------	Fair		Poor		Poor	
	Too clayey	0.98	Depth to saturated zone	0.00	Depth to saturated zone	0.00
			Low strength	0.00	Too clayey	0.00
			Shrink-swell	0.90		
Urban land----------	Not rated		Not rated		Not rated	
4135:						
Coland, occasionally flooded-----------	Fair		Poor		Poor	
	Too clayey	0.98	Depth to saturated zone	0.00	Depth to saturated zone	0.00
			Low strength	0.00	Too clayey	0.00
Urban land----------	Not rated		Not rated		Not rated	
4152:						
Marshan, 24 to 40 inches to sand and gravel------------	Fair		Poor		Poor	
	Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.00
					Hard to reclaim	0.92
Urban land----------	Not rated		Not rated		Not rated	
4159:						
Finchford-----------	Poor		Good		Poor	
	Too sandy	0.00			Too sandy	0.00
	Wind erosion	0.00			Hard to reclaim	0.68
	Low content of organic matter	0.12				
	Droughty	0.29				
	Too acid	0.74				
Urban land----------	Not rated		Not rated		Not rated	
4159C:						
Finchford-----------	Poor		Good		Poor	
	Too sandy	0.00			Too sandy	0.00
	Wind erosion	0.00			Rock fragments	0.00
	Low content of organic matter	0.12			Hard to reclaim	0.68
	Droughty	0.17				
	Too acid	0.74				
Urban land----------	Not rated		Not rated		Not rated	
4171B:						
Bassett-------------	Fair		Fair		Good	
	Low content of organic matter	0.12	Depth to saturated zone	0.53		
	Too acid	0.88	Low strength	0.78		
Urban land----------	Not rated		Not rated		Not rated	

Table 15b.--Construction Materials

Map symbol and soil name	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
4171D:						
Bassett	Fair		Fair		Fair	
	Low content of organic matter	0.12	Depth to saturated zone	0.53	Slope	0.37
	Too acid	0.88	Low strength	0.78		
Urban land	Not rated		Not rated		Not rated	
4175:						
Dickinson	Fair		Good		Good	
	Low content of organic matter	0.12				
	Too acid	0.84				
	Droughty	0.95				
Urban land	Not rated		Not rated		Not rated	
4175B:						
Dickinson	Fair		Good		Good	
	Low content of organic matter	0.12				
	Too acid	0.84				
	Droughty	0.95				
Urban land	Not rated		Not rated		Not rated	
4177:						
Saude	Fair		Good		Fair	
	Low content of organic matter	0.12			Hard to reclaim	0.82
	Too acid	0.74				
Urban land	Not rated		Not rated		Not rated	
4177B:						
Saude	Fair		Good		Fair	
	Low content of organic matter	0.12			Hard to reclaim	0.82
	Too acid	0.74				
Urban land	Not rated		Not rated		Not rated	
4178:						
Waukee	Fair		Good		Good	
	Low content of organic matter	0.12			Hard to reclaim	0.98
	Too acid	0.74				
Urban land	Not rated		Not rated		Not rated	
4184:						
Klinger	Fair		Poor		Fair	
	Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.50
	Too acid	0.84	Low strength	0.78		
	Water erosion	0.90				
Urban land	Not rated		Not rated		Not rated	

Table 15b.--Construction Materials

Map symbol and soil name	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
4198B:						
Floyd	Good		Poor		Fair	
			Depth to saturated zone	0.00	Depth to saturated zone	0.50
Urban land	Not rated		Not rated		Not rated	
4226:						
Lawler, 24 to 40 inches to sand and gravel	Fair		Poor		Fair	
	Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.50
	Too acid	0.84			Hard to reclaim	0.82
Urban land	Not rated		Not rated		Not rated	
4284:						
Flagler	Fair		Good		Good	
	Low content of organic matter	0.12				
	Too acid	0.84				
	Droughty	0.87				
Urban land	Not rated		Not rated		Not rated	
4284B:						
Flagler	Fair		Good		Good	
	Low content of organic matter	0.12				
	Too acid	0.84				
	Droughty	0.87				
Urban land	Not rated		Not rated		Not rated	
4377B:						
Dinsdale	Fair		Fair		Poor	
	Low content of organic matter	0.12	Low strength	0.78	Too clayey	0.00
			Shrink-swell	0.99		
	Water erosion	0.90				
	Too clayey	0.92				
	Too acid	0.97				
Urban land	Not rated		Not rated		Not rated	
4377C:						
Dinsdale	Fair		Fair		Poor	
	Low content of organic matter	0.12	Low strength	0.78	Too clayey	0.00
			Shrink-swell	0.99		
	Water erosion	0.90				
	Too clayey	0.92				
	Too acid	0.97				
Urban land	Not rated		Not rated		Not rated	
4382:						
Maxfield	Fair		Poor		Poor	
	Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Too clayey	0.98	Low strength	0.78	Too clayey	0.00

Table 15b.--Construction Materials

Map symbol and soil name	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
4382:						
Urban land	Not rated		Not rated		Not rated	
4391B:						
Clyde	Fair		Poor		Poor	
	Water erosion	0.99	Depth to saturated zone	0.00	Depth to saturated zone	0.00
			Low strength	0.22		
			Shrink-swell	0.99		
Floyd	Good		Poor		Fair	
			Depth to saturated zone	0.00	Depth to saturated zone	0.50
Urban land	Not rated		Not rated		Not rated	
4398:						
Tripoli	Fair		Poor		Poor	
	Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.00
Urban land	Not rated		Not rated		Not rated	
4399:						
Readlyn	Fair		Poor		Fair	
	Low content of organic matter	0.50	Depth to saturated zone	0.00	Depth to saturated zone	0.50
	Too acid	0.84				
Urban land	Not rated		Not rated		Not rated	
4408B:						
Olin	Fair		Good		Good	
	Low content of organic matter	0.12				
	Too acid	0.74				
	Water erosion	0.99				
Urban land	Not rated		Not rated		Not rated	
4408C:						
Olin	Fair		Good		Good	
	Low content of organic matter	0.12				
	Too acid	0.74				
	Water erosion	0.99				
Urban land	Not rated		Not rated		Not rated	
4426B:						
Aredale	Fair		Good		Good	
	Low content of organic matter	0.12				
	Too acid	0.74				
Urban land	Not rated		Not rated		Not rated	

Table 15b.--Construction Materials

Map symbol and soil name	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
4426C:						
Aredale-------------	Fair		Good		Good	
	Low content of organic matter	0.12				
	Too acid	0.74				
Urban land----------	Not rated		Not rated		Not rated	
4585:						
Spillville, occasionally flooded------------	Good		Poor		Fair	
			Depth to saturated zone	0.00	Depth to saturated zone	0.50
			Low strength	0.00		
Coland, occasionally flooded------------	Fair		Poor		Poor	
	Too clayey	0.98	Depth to saturated zone	0.00	Depth to saturated zone	0.00
			Low strength	0.00	Too clayey	0.00
Urban land----------	Not rated		Not rated		Not rated	
4761:						
Franklin------------	Fair		Poor		Poor	
	Low content of organic matter	0.12	Depth to saturated zone	0.00	Too clayey	0.00
	Too acid	0.54	Low strength	0.78	Depth to saturated zone	0.50
	Too clayey	0.92			Too acid	0.98
	Water erosion	0.99				
Urban land----------	Not rated		Not rated		Not rated	
4771B:						
Waubeek-------------	Fair		Good		Good	
	Low content of organic matter	0.12				
	Too acid	0.74				
	Water erosion	0.99				
Urban land----------	Not rated		Not rated		Not rated	
4771D:						
Waubeek-------------	Fair		Good		Good	
	Low content of organic matter	0.12			Slope	0.96
	Too acid	0.74				
	Water erosion	0.99				
Urban land----------	Not rated		Not rated		Not rated	
4798:						
Protivin------------	Fair		Poor		Poor	
	Low content of organic matter	0.12	Depth to saturated zone	0.00	Too clayey	0.00
	Too acid	0.74	Low strength	0.00	Depth to saturated zone	0.50
	Too clayey	0.98	Shrink-swell	0.97		
	Water erosion	0.99				
Urban land----------	Not rated		Not rated		Not rated	

Table 15b.--Construction Materials

Map symbol and soil name	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
4911B:						
Colo	Fair		Poor		Poor	
	Too clayey	0.98	Depth to saturated zone	0.00	Depth to saturated zone	0.00
			Low strength	0.00	Too clayey	0.00
			Shrink-swell	0.90		
Ely	Fair		Poor		Fair	
	Water erosion	0.90	Depth to saturated zone	0.00	Depth to saturated zone	0.50
			Low strength	0.00		
			Shrink-swell	0.99		
Urban land	Not rated		Not rated		Not rated	
4933:						
Sawmill, occasionally flooded	Fair		Poor		Poor	
	Too clayey	0.98	Depth to saturated zone	0.00	Depth to saturated zone	0.00
			Low strength	0.00	Too clayey	0.00
			Shrink-swell	0.90		
Urban land	Not rated		Not rated		Not rated	
4946:						
Orthents, loamy	Not rated		Not rated		Not rated	
Urban land	Not rated		Not rated		Not rated	
5010:						
Pits, sand and gravel	Not rated		Not rated		Not rated	
5030:						
Pits, limestone quarries	Not rated		Not rated		Not rated	
5040:						
Orthents, loamy	Not rated		Not rated		Not rated	
5053:						
Psammaquents, frequently flooded	Not rated		Not rated		Not rated	
5080:						
Orthents, sanitary landfill	Not rated		Not rated		Not rated	
AW:						
Animal waste	Not rated		Not rated		Not rated	
SL:						
Sewage lagoon	Not rated		Not rated		Not rated	

Table 15b.--Construction Materials

Map symbol and soil name	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
W:						
Water---------------	Not rated		Not rated		Not rated	

Table 16.--Water 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. "Not rated" indicates that data are not available or that no rating is applicable. See text 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
7:						
Wiota	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Piping	0.81	No ground water	1.00
			Seepage	0.10		
41:						
Sparta	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.35	No ground water	1.00
41B:						
Sparta	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.35	No ground water	1.00
41C:						
Sparta	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.35	No ground water	1.00
41D:						
Sparta	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.35	No ground water	1.00
	Slope	0.01				
63B:						
Chelsea	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.12	No ground water	1.00
63C:						
Chelsea	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.12	No ground water	1.00
63D:						
Chelsea	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.12	No ground water	1.00
	Slope	0.01				
83B:						
Kenyon	Somewhat limited		Somewhat limited		Somewhat limited	
	Seepage	0.70	Piping	0.50	Depth to water	0.81
					Slow refill	0.30
					Cutbanks cave	0.10
83C:						
Kenyon	Somewhat limited		Somewhat limited		Somewhat limited	
	Seepage	0.70	Piping	0.50	Depth to water	0.81
					Slow refill	0.30
					Cutbanks cave	0.10
83C2:						
Kenyon, moderately eroded	Somewhat limited		Somewhat limited		Somewhat limited	
	Seepage	0.70	Piping	0.50	Depth to water	0.81
					Slow refill	0.30
					Cutbanks cave	0.10

Table 16.--Water Management--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
83D2:						
Kenyon, moderately eroded	Somewhat limited		Somewhat limited		Somewhat limited	
	Seepage	0.70	Piping	0.50	Depth to water	0.81
	Slope	0.01			Slow refill	0.30
					Cutbanks cave	0.10
84:						
Clyde	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
					Cutbanks cave	0.10
			Piping	0.30		
88:						
Nevin	Somewhat limited		Very limited		Very limited	
	Seepage	0.70	Depth to saturated zone	1.00	Cutbanks cave	1.00
					Slow refill	0.30
			Piping	0.49		
			Seepage	0.42		
133:						
Colo, occasionally flooded	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
					Cutbanks cave	0.10
135:						
Coland, occasionally flooded	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	0.10
			Piping	0.31		
			Seepage	0.03		
159:						
Finchford	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.46	No ground water	1.00
159C:						
Finchford	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.46	No ground water	1.00
171B:						
Bassett	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
					Cutbanks cave	0.10
			Piping	0.61	Depth to water	0.01
175:						
Dickinson	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.36	No ground water	1.00
175B:						
Dickinson	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.36	No ground water	1.00
177:						
Saude	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.60	No ground water	1.00

Table 16.--Water Management--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
177B:						
Saude---------------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.60	No ground water	1.00
178:						
Waukee--------------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.67	No ground water	1.00
178B:						
Waukee--------------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.67	No ground water	1.00
184:						
Klinger-------------	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
					Cutbanks cave	0.10
			Piping	0.05		
198B:						
Floyd---------------	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	0.10
			Piping	0.95		
213B:						
Rockton, 30 to 40 inches to limestone	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.70	Piping	0.74	No ground water	1.00
	Depth to bedrock	0.69	Thin layer	0.70		
221:						
Klossner------------	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	0.10
284:						
Flagler-------------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.08	No ground water	1.00
284B:						
Flagler-------------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.08	No ground water	1.00
290:						
Dells---------------	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
			Piping	1.00		
			Seepage	0.67		
354:						
Aquolls, ponded-----	Not limited		Very limited		Somewhat limited	
			Ponding	1.00	Cutbanks cave	0.10
			Depth to saturated zone	1.00		
377B:						
Dinsdale------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Seepage	0.70	Piping	0.22	Depth to water	0.81
					Slow refill	0.30
					Cutbanks cave	0.10

Table 16.--Water Management--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
377C:						
Dinsdale	Somewhat limited		Somewhat limited		Somewhat limited	
	Seepage	0.70	Piping	0.22	Depth to water	0.81
					Slow refill	0.30
					Cutbanks cave	0.10
377C2:						
Dinsdale, moderately eroded	Somewhat limited		Somewhat limited		Somewhat limited	
	Seepage	0.70	Piping	0.28	Depth to water	0.81
					Slow refill	0.30
					Cutbanks cave	0.10
382:						
Maxfield	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
					Cutbanks cave	0.10
391B:						
Clyde	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
					Cutbanks cave	0.10
			Piping	0.30		
Floyd	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	0.10
			Piping	0.95		
395B:						
Marquis	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
					Cutbanks cave	0.10
			Piping	0.50	Depth to water	0.01
398:						
Tripoli	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
					Cutbanks cave	0.10
			Piping	0.21		
399:						
Readlyn	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
					Cutbanks cave	0.10
			Piping	0.26		
408B:						
Olin	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Piping	0.91	No ground water	1.00
408C:						
Olin	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Piping	0.91	No ground water	1.00
412C:						
Emeline	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Thin layer	1.00	No ground water	1.00
	Seepage	0.01	Piping	0.18		

Table 16.--Water Management--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
426B:						
Aredale	Very limited		Very limited		Very limited	
	Seepage	1.00	Piping	0.99	No ground water	1.00
			Seepage	0.02		
426C:						
Aredale	Very limited		Very limited		Very limited	
	Seepage	1.00	Piping	0.99	No ground water	1.00
			Seepage	0.02		
426C2:						
Aredale, moderately eroded	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Piping	0.92	No ground water	1.00
468B:						
Dunkerton	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	0.10
			Piping	0.86		
468C:						
Dunkerton	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	0.10
			Piping	0.86		
471:						
Oran	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
					Cutbanks cave	0.10
			Piping	0.71		
485:						
Spillville, occasionally flooded	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	0.10
			Piping	0.59		
585:						
Spillville, occasionally flooded	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	0.10
			Piping	0.59		
Coland, occasionally flooded	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	0.10
			Piping	0.22		
			Seepage	0.03		

Table 16.--Water Management--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
626:						
Hayfield, 24 to 40 inches to sand and gravel-------------	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
			Seepage	0.54		
761:						
Franklin------------	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
					Cutbanks cave	0.10
			Piping	0.30		
771B:						
Waubeek-------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Seepage	0.70	Piping	0.45	Depth to water	0.81
					Slow refill	0.30
					Cutbanks cave	0.10
775B:						
Billett-------------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.08	No ground water	1.00
776C:						
Lilah---------------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.11	No ground water	1.00
777:						
Wapsie--------------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.41	No ground water	1.00
781B:						
Lourdes-------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Seepage	0.05	Piping	0.18	Slow refill	0.95
					Depth to water	0.81
					Cutbanks cave	0.10
781C2:						
Lourdes, moderately eroded-------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Seepage	0.05	Piping	0.15	Slow refill	0.95
					Depth to water	0.81
					Cutbanks cave	0.10
782B:						
Donnan--------------	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
					Cutbanks cave	0.10
798:						
Protivin------------	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.05	Depth to saturated zone	1.00	Slow refill	0.30
					Cutbanks cave	0.10
			Piping	0.02		
809B:						
Bertram-------------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Thin layer	0.86	No ground water	1.00
	Depth to bedrock	0.86	Seepage	0.03		

Table 16.--Water Management--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
877B:						
Dinsmore	Somewhat limited		Somewhat limited		Somewhat limited	
	Seepage	0.70	Piping	0.18	Depth to water	0.81
					Slow refill	0.30
					Cutbanks cave	0.10
884:						
Klingmore	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
					Cutbanks cave	0.10
911B:						
Colo	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
					Cutbanks cave	0.10
Ely	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
					Cutbanks cave	0.10
			Piping	0.25		
933:						
Sawmill, occasionally flooded	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
					Cutbanks cave	0.10
			Piping	0.01		
982:						
Maxmore	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
					Cutbanks cave	0.10
1152:						
Marshan, 24 to 40 inches to sand and gravel	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
			Seepage	0.82		
1226:						
Lawler, 24 to 40 inches to sand and gravel	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
			Seepage	0.08		
1285G:						
Burkhardt	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.87	No ground water	1.00
	Slope	0.50				
Bassett	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
	Slope	0.50			Cutbanks cave	0.10
			Piping	0.61	Depth to water	0.01

Table 16.--Water Management--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
1285G:						
Chelsea-------------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.19	No ground water	1.00
	Slope	0.50				
1585:						
Spillville, frequently flooded	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	0.10
			Piping	0.59		
Coland, frequently flooded------------	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	0.10
			Piping	0.22		
			Seepage	0.03		
Aquolls, ponded-----	Not limited		Very limited		Somewhat limited	
			Ponding	1.00	Cutbanks cave	0.10
			Depth to saturated zone	1.00		
1586:						
Sigglekov, frequently flooded	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
			Seepage	0.52		
Fluvaquents, frequently flooded	Not limited		Very limited		Somewhat limited	
			Depth to saturated zone		Cutbanks cave	0.10
Aquents, ponded-----	Not limited		Very limited		Somewhat limited	
			Ponding	1.00	Cutbanks cave	0.10
			Depth to saturated zone	1.00		
4000:						
Urban land----------	Not rated		Not rated		Not rated	
4007:						
Wiota---------------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Piping	0.81	No ground water	1.00
			Seepage	0.10		
Urban land----------	Not rated		Not rated		Not rated	
4041:						
Sparta--------------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.35	No ground water	1.00
Urban land----------	Not rated		Not rated		Not rated	

Table 16.--Water Management--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
4041B:						
Sparta--------------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.35	No ground water	1.00
Urban land----------	Not rated		Not rated		Not rated	
4041C:						
Sparta--------------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.35	No ground water	1.00
Urban land----------	Not rated		Not rated		Not rated	
4041D:						
Sparta--------------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.35	No ground water	1.00
	Slope	0.01				
Urban land----------	Not rated		Not rated		Not rated	
4063B:						
Chelsea-------------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.12	No ground water	1.00
Urban land----------	Not rated		Not rated		Not rated	
4063C:						
Chelsea-------------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.12	No ground water	1.00
Urban land----------	Not rated		Not rated		Not rated	
4063D:						
Chelsea-------------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.12	No ground water	1.00
	Slope	0.01				
Urban land----------	Not rated		Not rated		Not rated	
4083B:						
Kenyon--------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Seepage	0.70	Piping	0.50	Depth to water	0.81
					Slow refill	0.30
					Cutbanks cave	0.10
Urban land----------	Not rated		Not rated		Not rated	
4083C:						
Kenyon--------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Seepage	0.70	Piping	0.50	Depth to water	0.81
					Slow refill	0.30
					Cutbanks cave	0.10
Urban land----------	Not rated		Not rated		Not rated	
4083D:						
Kenyon--------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Seepage	0.70	Piping	0.50	Depth to water	0.81
	Slope	0.01			Slow refill	0.30
					Cutbanks cave	0.10
Urban land----------	Not rated		Not rated		Not rated	

Table 16.--Water Management--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
4084:						
Clyde	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
					Cutbanks cave	0.10
			Piping	0.30		
Urban land	Not rated		Not rated		Not rated	
4088:						
Nevin	Somewhat limited		Very limited		Very limited	
	Seepage	0.70	Depth to saturated zone	1.00	Cutbanks cave	1.00
					Slow refill	0.30
			Piping	0.49		
			Seepage	0.42		
Urban land	Not rated		Not rated		Not rated	
4133:						
Colo, occasionally flooded	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
					Cutbanks cave	0.10
Urban land	Not rated		Not rated		Not rated	
4135:						
Coland, occasionally flooded	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	0.10
			Piping	0.31		
			Seepage	0.03		
Urban land	Not rated		Not rated		Not rated	
4152:						
Marshan, 24 to 40 inches to sand and gravel	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
			Seepage	0.82		
Urban land	Not rated		Not rated		Not rated	
4159:						
Finchford	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.46	No ground water	1.00
Urban land	Not rated		Not rated		Not rated	
4159C:						
Finchford	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.46	No ground water	1.00
Urban land	Not rated		Not rated		Not rated	

Table 16.--Water Management--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
4171B:						
Bassett-------------	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
					Cutbanks cave	0.10
			Piping	0.61	Depth to water	0.01
Urban land----------	Not rated		Not rated		Not rated	
4171D:						
Bassett-------------	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
	Slope	0.01			Cutbanks cave	0.10
			Piping	0.61	Depth to water	0.01
Urban land----------	Not rated		Not rated		Not rated	
4175:						
Dickinson-----------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.36	No ground water	1.00
Urban land----------	Not rated		Not rated		Not rated	
4175B:						
Dickinson-----------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.36	No ground water	1.00
Urban land----------	Not rated		Not rated		Not rated	
4177:						
Saude---------------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.60	No ground water	1.00
Urban land----------	Not rated		Not rated		Not rated	
4177B:						
Saude---------------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.60	No ground water	1.00
Urban land----------	Not rated		Not rated		Not rated	
4178:						
Waukee--------------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.67	No ground water	1.00
Urban land----------	Not rated		Not rated		Not rated	
4184:						
Klinger-------------	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
					Cutbanks cave	0.10
			Piping	0.05		
Urban land----------	Not rated		Not rated		Not rated	
4198B:						
Floyd---------------	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	0.10
			Piping	0.95		
Urban land----------	Not rated		Not rated		Not rated	

Table 16.--Water Management--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
4226:						
Lawler, 24 to 40 inches to sand and gravel	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
			Seepage	0.08		
Urban land	Not rated		Not rated		Not rated	
4284:						
Flagler	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.08	No ground water	1.00
Urban land	Not rated		Not rated		Not rated	
4284B:						
Flagler	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.08	No ground water	1.00
Urban land	Not rated		Not rated		Not rated	
4377B:						
Dinsdale	Somewhat limited		Somewhat limited		Somewhat limited	
	Seepage	0.70	Piping	0.22	Depth to water	0.81
					Slow refill	0.30
					Cutbanks cave	0.10
Urban land	Not rated		Not rated		Not rated	
4377C:						
Dinsdale	Somewhat limited		Somewhat limited		Somewhat limited	
	Seepage	0.70	Piping	0.22	Depth to water	0.81
					Slow refill	0.30
					Cutbanks cave	0.10
Urban land	Not rated		Not rated		Not rated	
4382:						
Maxfield	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
					Cutbanks cave	0.10
Urban land	Not rated		Not rated		Not rated	
4391B:						
Clyde	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
					Cutbanks cave	0.10
			Piping	0.30		
Floyd	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	0.10
			Piping	0.95		
Urban land	Not rated		Not rated		Not rated	

Table 16.--Water Management--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
4398:						
Tripoli	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
					Cutbanks cave	0.10
			Piping	0.21		
Urban land	Not rated		Not rated		Not rated	
4399:						
Readlyn	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
					Cutbanks cave	0.10
			Piping	0.26		
Urban land	Not rated		Not rated		Not rated	
4408B:						
Olin	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Piping	0.91	No ground water	1.00
Urban land	Not rated		Not rated		Not rated	
4408C:						
Olin	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Piping	0.91	No ground water	1.00
Urban land	Not rated		Not rated		Not rated	
4426B:						
Aredale	Very limited		Very limited		Very limited	
	Seepage	1.00	Piping	0.99	No ground water	1.00
			Seepage	0.02		
Urban land	Not rated		Not rated		Not rated	
4426C:						
Aredale	Very limited		Very limited		Very limited	
	Seepage	1.00	Piping	0.99	No ground water	1.00
			Seepage	0.02		
Urban land	Not rated		Not rated		Not rated	
4585:						
Spillville, occasionally flooded	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	0.10
			Piping	0.59		
Coland, occasionally flooded	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	0.10
			Piping	0.22		
			Seepage	0.03		
Urban land	Not rated		Not rated		Not rated	

Table 16.--Water Management--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
4761:						
Franklin	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
					Cutbanks cave	0.10
			Piping	0.30		
Urban land	Not rated		Not rated		Not rated	
4771B:						
Waubeek	Somewhat limited		Somewhat limited		Somewhat limited	
	Seepage	0.70	Piping	0.45	Depth to water	0.81
					Slow refill	0.30
					Cutbanks cave	0.10
Urban land	Not rated		Not rated		Not rated	
4771D:						
Waubeek	Somewhat limited		Somewhat limited		Somewhat limited	
	Seepage	0.70	Piping	0.45	Depth to water	0.81
					Slow refill	0.30
					Cutbanks cave	0.10
Urban land	Not rated		Not rated		Not rated	
4798:						
Protivin	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.05	Depth to saturated zone	1.00	Slow refill	0.30
					Cutbanks cave	0.10
			Piping	0.02		
Urban land	Not rated		Not rated		Not rated	
4911B:						
Colo	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
					Cutbanks cave	0.10
Ely	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
					Cutbanks cave	0.10
			Piping	0.25		
Urban land	Not rated		Not rated		Not rated	
4933:						
Sawmill, occasionally flooded	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
					Cutbanks cave	0.10
			Piping	0.01		
Urban land	Not rated		Not rated		Not rated	
4946:						
Orthents, loamy	Not rated		Not rated		Not rated	
Urban land	Not rated		Not rated		Not rated	

Table 16.--Water Management--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
5010:						
Pits, sand and gravel	Not rated		Not rated		Not rated	
5030:						
Pits, limestone quarries	Not rated		Not rated		Not rated	
5040:						
Orthents, loamy	Not rated		Not rated		Not rated	
5053:						
Psammaquents, frequently flooded	Not limited		Very limited		Somewhat limited	
			Depth to saturated zone	1.00	Cutbanks cave	0.10
5080:						
Orthents, sanitary landfill	Not rated		Not rated		Not rated	
AW:						
Animal waste	Not rated		Not rated		Not rated	
SL:						
Sewage lagoon	Not rated		Not rated		Not rated	
W:						
Water	Not rated		Not rated		Not rated	

Table 17a.--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. "Not rated" indicates that data are not available or that no rating is applicable. See text 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
7:						
Wiota	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
41:						
Sparta	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Leaching	0.45	Droughty	0.32	Droughty	0.32
	Droughty	0.32	Too acid	0.07	Too acid	0.07
	Too acid	0.02				
41B:						
Sparta	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Leaching	0.45	Droughty	0.32	Droughty	0.32
	Droughty	0.32	Too acid	0.07	Too steep for surface application	0.08
	Too acid	0.02			Too acid	0.07
41C:						
Sparta	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Leaching	0.45	Droughty	0.36	Too steep for surface application	0.92
	Droughty	0.36	Too acid	0.07	Droughty	0.36
	Too acid	0.02			Too acid	0.07
					Too steep for sprinkler application	0.02
41D:						
Sparta	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Slope	0.63	Slope	0.63	Too steep for surface application	1.00
	Leaching	0.45	Droughty	0.38	Too steep for sprinkler application	0.78
	Droughty	0.38	Too acid	0.07	Droughty	0.38
	Too acid	0.02			Too acid	0.07

Table 17a.--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
63B:						
Chelsea	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Leaching	0.45	Droughty	0.06	Too steep for surface application	0.08
	Droughty	0.06			Droughty	0.06
63C:						
Chelsea	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Leaching	0.45	Droughty	0.06	Too steep for surface application	0.92
	Droughty	0.06			Droughty	0.06
					Too steep for sprinkler application	0.02
63D:						
Chelsea	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Slope	0.63	Slope	0.63	Too steep for surface application	1.00
	Leaching	0.45	Droughty	0.06	Too steep for sprinkler application	0.78
	Droughty	0.06			Droughty	0.06
83B:						
Kenyon	Not limited		Not limited		Somewhat limited	
					Too steep for surface application	0.08
83C:						
Kenyon	Not limited		Not limited		Somewhat limited	
					Too steep for surface application	0.92
					Too steep for sprinkler application	0.02
83C2:						
Kenyon, moderately eroded	Not limited		Not limited		Somewhat limited	
					Too steep for surface application	0.92
					Too steep for sprinkler application	0.02

Table 17a.--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
83D2:						
Kenyon, moderately eroded	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.63	Slope	0.63	Too steep for surface application	1.00
					Too steep for sprinkler application	0.78
84:						
Clyde	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Leaching	0.70				
88:						
Nevin	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
			Flooding	0.40		
133:						
Colo, occasionally flooded	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Leaching	0.70	Flooding	1.00	Flooding	0.60
	Flooding	0.60				
135:						
Coland, occasionally flooded	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Leaching	0.70	Flooding	1.00	Flooding	0.60
	Flooding	0.60				
159:						
Finchford	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Droughty	0.71	Droughty	0.71	Droughty	0.71
	Leaching	0.45				
159C:						
Finchford	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Droughty	0.83	Droughty	0.83	Droughty	0.83
	Leaching	0.45			Too steep for surface application	0.68

Table 17a.--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
171B:						
Bassett	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Too acid	0.02	Too acid	0.07	Too steep for surface application	0.08
					Too acid	0.07
175:						
Dickinson	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Droughty	0.05	Droughty	0.05	Droughty	0.05
175B:						
Dickinson	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Droughty	0.05	Droughty	0.05	Too steep for surface application	0.08
					Droughty	0.05
177:						
Saude	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
177B:						
Saude	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
					Too steep for surface application	0.08
178:						
Waukee	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Too acid	0.03	Too acid	0.14	Too acid	0.14
178B:						
Waukee	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Too acid	0.03	Too acid	0.14	Too acid	0.14
					Too steep for surface application	0.08
184:						
Klinger	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Too acid	0.02	Too acid	0.07	Too acid	0.07

Table 17a.--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
198B:						
Floyd	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Filtering capacity	0.01	Filtering capacity	0.01	Filtering capacity	0.01
213B:						
Rockton, 30 to 40 inches to limestone	Somewhat limited		Very limited		Somewhat limited	
	Too acid	0.11	Low adsorption	1.00	Too acid	0.42
	Depth to bedrock	0.10	Too acid	0.42	Depth to bedrock	0.10
			Depth to bedrock	0.10	Too steep for surface application	0.08
221:						
Klossner	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Leaching	0.90	Too acid	0.07	Too acid	0.07
	Too acid	0.02				
284:						
Flagler	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Droughty	0.13	Droughty	0.13	Droughty	0.13
284B:						
Flagler	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Droughty	0.13	Droughty	0.13	Droughty	0.13
					Too steep for surface application	0.08
290:						
Dells	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
354:						
Aquolls, ponded	Not rated		Not rated		Not rated	
377B:						
Dinsdale	Somewhat limited		Somewhat limited		Somewhat limited	
	Too acid	0.02	Too acid	0.07	Too steep for surface application	0.08
					Too acid	0.07

Table 17a.--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
377C:						
Dinsdale	Somewhat limited		Somewhat limited		Somewhat limited	
	Too acid	0.02	Too acid	0.07	Too steep for surface application	0.92
					Too acid	0.07
					Too steep for sprinkler application	0.02
377C2:						
Dinsdale, moderately eroded	Somewhat limited		Somewhat limited		Somewhat limited	
	Too acid	0.02	Too acid	0.07	Too steep for surface application	0.92
					Too acid	0.07
					Too steep for sprinkler application	0.02
382:						
Maxfield	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Leaching	0.70				
391B:						
Clyde	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Leaching	0.70				
Floyd	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Filtering capacity	0.01	Filtering capacity	0.01	Filtering capacity	0.01
395B:						
Marquis	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
					Too steep for surface application	0.08
398:						
Tripoli	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Leaching	0.70				

Table 17a.--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
399:						
Readlyn	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Too acid	0.02	Too acid	0.07	Too acid	0.07
408B:						
Olin	Somewhat limited		Somewhat limited		Somewhat limited	
	Filtering capacity	0.01	Filtering capacity	0.01	Too steep for surface application	0.08
					Filtering capacity	0.01
408C:						
Olin	Somewhat limited		Somewhat limited		Somewhat limited	
	Filtering capacity	0.01	Filtering capacity	0.01	Too steep for surface application	0.92
					Too steep for sprinkler application	0.02
					Filtering capacity	0.01
412C:						
Emeline	Not rated		Not rated		Not rated	
426B:						
Aredale	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.30	Restricted permeability	0.22	Restricted permeability	0.22
	Filtering capacity	0.01	Filtering capacity	0.01	Too steep for surface application	0.08
					Filtering capacity	0.01
426C:						
Aredale	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.30	Restricted permeability	0.22	Too steep for surface application	0.92
	Filtering capacity	0.01	Filtering capacity	0.01	Restricted permeability	0.22
					Too steep for sprinkler application	0.02
					Filtering capacity	0.01

Table 17a.--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
426C2:						
Aredale, moderately eroded	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.30	Restricted permeability	0.22	Too steep for surface application	0.92
	Filtering capacity	0.01	Filtering capacity	0.01	Restricted permeability	0.22
					Too steep for sprinkler application	0.02
					Filtering capacity	0.01
468B:						
Dunkerton	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Restricted permeability	0.30	Restricted permeability	0.22	Restricted permeability	0.22
	Filtering capacity	0.01	Filtering capacity	0.01	Too steep for surface application	0.08
					Filtering capacity	0.01
468C:						
Dunkerton	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Restricted permeability	0.30	Restricted permeability	0.22	Too steep for surface application	0.92
	Filtering capacity	0.01	Filtering capacity	0.01	Restricted permeability	0.22
					Too steep for sprinkler application	0.02
					Filtering capacity	0.01
471:						
Oran	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Too acid	0.02	Too acid	0.07	Too acid	0.07
485:						
Spillville, occasionally flooded	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Flooding	0.60	Flooding	1.00	Flooding	0.60

Table 17a.--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
585:						
Spillville, occasionally flooded	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Flooding	0.60	Flooding	1.00	Flooding	0.60
Coland, occasionally flooded	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Leaching	0.70	Flooding	1.00	Flooding	0.60
	Flooding	0.60				
626:						
Hayfield, 24 to 40 inches to sand and gravel	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
761:						
Franklin	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Too acid	0.08	Too acid	0.31	Too acid	0.31
771B:						
Waubeek	Not limited		Not limited		Somewhat limited	
					Too steep for surface application	0.08
775B:						
Billett	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Too acid	0.02	Too acid	0.07	Too steep for surface application	0.08
					Too acid	0.07
776C:						
Lilah	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	0.67	Too steep for surface application	0.68
	Too acid	0.18			Too acid	0.67

Table 17a.--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
777:						
Wapsie	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
781B:						
Lourdes	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.30	Restricted permeability	0.22	Restricted permeability	0.22
					Too steep for surface application	0.08
781C2:						
Lourdes, moderately eroded	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.30	Restricted permeability	0.22	Too steep for surface application	0.92
					Restricted permeability	0.22
					Too steep for sprinkler application	0.02
782B:						
Donnan	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Too acid	0.02	Too acid	0.07	Too steep for surface application	0.08
					Too acid	0.07
798:						
Protivin	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Restricted permeability	0.30	Restricted permeability	0.22	Restricted permeability	0.22
	Too acid	0.02	Too acid	0.07	Too acid	0.07
809B:						
Bertram	Somewhat limited		Very limited		Somewhat limited	
	Droughty	0.85	Low adsorption	1.00	Droughty	0.85
	Depth to bedrock	0.46	Droughty	0.85	Depth to bedrock	0.46
	Filtering capacity	0.01	Depth to bedrock	0.46	Too steep for surface application	0.08
			Filtering capacity	0.01	Filtering capacity	0.01

Table 17a.--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
877B:						
Dinsmore	Somewhat limited		Somewhat limited		Somewhat limited	
	Too acid	0.02	Too acid	0.07	Too steep for surface application	0.08
					Too acid	0.07
884:						
Klingmore	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Too acid	0.02	Too acid	0.07	Too acid	0.07
911B:						
Colo	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Leaching	0.70				
Ely	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
					Too steep for surface application	0.08
933:						
Sawmill, occasionally flooded	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Leaching	0.70	Flooding	1.00	Flooding	0.60
	Flooding	0.60				
982:						
Maxmore	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Leaching	0.70				
1152:						
Marshan, 24 to 40 inches to sand and gravel	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Leaching	0.70				

Table 17a.--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
1226:						
Lawler, 24 to 40 inches to sand and gravel	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
1285G:						
Burkhardt	Very limited		Very limited		Very limited	
	Slope	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Filtering capacity	1.00	Slope	1.00	Too steep for sprinkler application	1.00
	Droughty	0.72	Droughty	0.72	Too steep for surface application	1.00
	Too acid	0.18	Too acid	0.67	Droughty	0.72
					Too acid	0.67
Bassett	Not rated		Very limited		Very limited	
			Slope	1.00	Too steep for sprinkler application	1.00
			Depth to saturated zone (Nov-Jul)	1.00	Too steep for surface application	1.00
			Too acid	0.07	Depth to saturated zone (Nov-Jul)	1.00
					Too acid	0.07
Chelsea	Not rated		Very limited		Very limited	
			Filtering capacity	1.00	Filtering capacity	1.00
			Slope	1.00	Too steep for sprinkler application	1.00
			Droughty	0.13	Too steep for surface application	1.00
					Droughty	0.13
1585:						
Spillville, frequently flooded	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Flooding	1.00	Flooding	1.00	Flooding	1.00
Coland, frequently flooded	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Flooding	1.00	Flooding	1.00	Flooding	1.00
	Leaching	0.70				

Table 17a.--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
1585:						
Aquolls, ponded-----	Not rated		Not rated		Not rated	
1586:						
Sigglekov, frequently flooded	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Flooding	1.00	Flooding	1.00	Flooding	1.00
	Droughty	0.96	Droughty	0.96	Droughty	0.96
	Leaching	0.45	Too acid	0.14	Too acid	0.14
Fluvaquents, frequently flooded	Not rated		Not rated		Not rated	
Aquents, ponded-----	Not rated		Not rated		Not rated	
4000:						
Urban land----------	Not rated		Not rated		Not rated	
4007:						
Wiota---------------	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
Urban land----------	Not rated		Not rated		Not rated	
4041:						
Sparta--------------	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Leaching	0.45	Droughty	0.32	Droughty	0.32
	Droughty	0.32	Too acid	0.07	Too acid	0.07
	Too acid	0.02				
Urban land----------	Not rated		Not rated		Not rated	
4041B:						
Sparta--------------	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Leaching	0.45	Droughty	0.32	Droughty	0.32
	Droughty	0.32	Too acid	0.07	Too steep for surface application	0.08
	Too acid	0.02			Too acid	0.07
Urban land----------	Not rated		Not rated		Not rated	

Table 17a.--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
4041C:						
Sparta	Very limited Filtering capacity Leaching Droughty Too acid	 1.00 0.45 0.36 0.02	Very limited Filtering capacity Droughty Too acid	 1.00 0.36 0.07	Very limited Filtering capacity Too steep for surface application Droughty Too acid Too steep for sprinkler application	 1.00 0.92 0.36 0.07 0.02
Urban land	Not rated		Not rated		Not rated	
4041D:						
Sparta	Very limited Filtering capacity Slope Leaching Droughty Too acid	 1.00 0.63 0.45 0.38 0.02	Very limited Filtering capacity Slope Droughty Too acid	 1.00 0.63 0.38 0.07	Very limited Filtering capacity Too steep for surface application Too steep for sprinkler application Droughty Too acid	 1.00 1.00 0.78 0.38 0.07
Urban land	Not rated		Not rated		Not rated	
4063B:						
Chelsea	Very limited Filtering capacity Leaching Droughty	 1.00 0.45 0.06	Very limited Filtering capacity Droughty	 1.00 0.06	Very limited Filtering capacity Too steep for surface application Droughty	 1.00 0.08 0.06
Urban land	Not rated		Not rated		Not rated	
4063C:						
Chelsea	Very limited Filtering capacity Leaching Droughty	 1.00 0.45 0.06	Very limited Filtering capacity Droughty	 1.00 0.06	Very limited Filtering capacity Too steep for surface application Droughty Too steep for sprinkler application	 1.00 0.92 0.06 0.02
Urban land	Not rated		Not rated		Not rated	

Table 17a.--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
4063D:						
Chelsea	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Slope	0.63	Slope	0.63	Too steep for surface application	1.00
	Leaching	0.45	Droughty	0.06	Too steep for sprinkler application	0.78
	Droughty	0.06			Droughty	0.06
Urban land	Not rated		Not rated		Not rated	
4083B:						
Kenyon	Not limited		Not limited		Somewhat limited	
					Too steep for surface application	0.08
Urban land	Not rated		Not rated		Not rated	
4083C:						
Kenyon	Not limited		Not limited		Somewhat limited	
					Too steep for surface application	0.92
					Too steep for sprinkler application	0.02
Urban land	Not rated		Not rated		Not rated	
4083D:						
Kenyon	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.63	Slope	0.63	Too steep for surface application	1.00
					Too steep for sprinkler application	0.78
Urban land	Not rated		Not rated		Not rated	
4084:						
Clyde	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Leaching	0.70				
Urban land	Not rated		Not rated		Not rated	
4088:						
Nevin	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
			Flooding	0.40		
Urban land	Not rated		Not rated		Not rated	

Table 17a.--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
4133:						
Colo, occasionally flooded-----------	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Leaching	0.70	Flooding	1.00	Flooding	0.60
	Flooding	0.60				
Urban land----------	Not rated		Not rated		Not rated	
4135:						
Coland, occasionally flooded-----------	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Leaching	0.70	Flooding	1.00	Flooding	0.60
	Flooding	0.60				
Urban land----------	Not rated		Not rated		Not rated	
4152:						
Marshan, 24 to 40 inches to sand and gravel------------	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Leaching	0.70				
Urban land----------	Not rated		Not rated		Not rated	
4159:						
Finchford----------	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Droughty	0.71	Droughty	0.71	Droughty	0.71
	Leaching	0.45				
Urban land----------	Not rated		Not rated		Not rated	
4159C:						
Finchford----------	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Droughty	0.83	Droughty	0.83	Droughty	0.83
	Leaching	0.45			Too steep for surface application	0.68
Urban land----------	Not rated		Not rated		Not rated	

Table 17a.--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
4171B:						
Bassett	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Too acid	0.02	Too acid	0.07	Too steep for surface application	0.08
					Too acid	0.07
Urban land	Not rated		Not rated		Not rated	
4171D:						
Bassett	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Too steep for surface application	1.00
	Slope	0.63	Slope	0.63	Depth to saturated zone (Nov-Jul)	1.00
	Too acid	0.02	Too acid	0.07	Too steep for sprinkler application	0.78
					Too acid	0.07
Urban land	Not rated		Not rated		Not rated	
4175:						
Dickinson	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Droughty	0.05	Droughty	0.05	Droughty	0.05
Urban land	Not rated		Not rated		Not rated	
4175B:						
Dickinson	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Droughty	0.05	Droughty	0.05	Too steep for surface application	0.08
					Droughty	0.05
Urban land	Not rated		Not rated		Not rated	
4177:						
Saude	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
Urban land	Not rated		Not rated		Not rated	
4177B:						
Saude	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
					Too steep for surface application	0.08

Table 17a.--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
4177B:						
Urban land	Not rated		Not rated		Not rated	
4178:						
Waukee	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Too acid	0.03	Too acid	0.14	Too acid	0.14
Urban land	Not rated		Not rated		Not rated	
4184:						
Klinger	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Too acid	0.02	Too acid	0.07	Too acid	0.07
Urban land	Not rated		Not rated		Not rated	
4198B:						
Floyd	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Filtering capacity	0.01	Filtering capacity	0.01	Filtering capacity	0.01
Urban land	Not rated		Not rated		Not rated	
4226:						
Lawler, 24 to 40 inches to sand and gravel	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
Urban land	Not rated		Not rated		Not rated	
4284:						
Flagler	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Droughty	0.13	Droughty	0.13	Droughty	0.13
Urban land	Not rated		Not rated		Not rated	
4284B:						
Flagler	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Droughty	0.13	Droughty	0.13	Droughty	0.13
					Too steep for surface application	0.08
Urban land	Not rated		Not rated		Not rated	

Table 17a.--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
4377B:						
Dinsdale	Somewhat limited		Somewhat limited		Somewhat limited	
	Too acid	0.02	Too acid	0.07	Too steep for surface application	0.08
					Too acid	0.07
Urban land	Not rated		Not rated		Not rated	
4377C:						
Dinsdale	Somewhat limited		Somewhat limited		Somewhat limited	
	Too acid	0.02	Too acid	0.07	Too steep for surface application	0.92
					Too acid	0.07
					Too steep for sprinkler application	0.02
Urban land	Not rated		Not rated		Not rated	
4382:						
Maxfield	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Leaching	0.70				
Urban land	Not rated		Not rated		Not rated	
4391B:						
Clyde	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Leaching	0.70				
Floyd	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Filtering capacity	0.01	Filtering capacity	0.01	Filtering capacity	0.01
Urban land	Not rated		Not rated		Not rated	
4398:						
Tripoli	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Leaching	0.70				
Urban land	Not rated		Not rated		Not rated	
4399:						
Readlyn	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Too acid	0.02	Too acid	0.07	Too acid	0.07

Table 17a.--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
4399:						
Urban land	Not rated		Not rated		Not rated	
4408B:						
Olin	Somewhat limited		Somewhat limited		Somewhat limited	
	Filtering capacity	0.01	Filtering capacity	0.01	Too steep for surface application Filtering capacity	0.08 0.01
Urban land	Not rated		Not rated		Not rated	
4408C:						
Olin	Somewhat limited		Somewhat limited		Somewhat limited	
	Filtering capacity	0.01	Filtering capacity	0.01	Too steep for surface application Too steep for sprinkler application Filtering capacity	0.92 0.02 0.01
Urban land	Not rated		Not rated		Not rated	
4426B:						
Aredale	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability Filtering capacity	0.30 0.01	Restricted permeability Filtering capacity	0.22 0.01	Restricted permeability Too steep for surface application Filtering capacity	0.22 0.08 0.01
Urban land	Not rated		Not rated		Not rated	
4426C:						
Aredale	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability Filtering capacity	0.30 0.01	Restricted permeability Filtering capacity	0.22 0.01	Too steep for surface application Restricted permeability Too steep for sprinkler application Filtering capacity	0.92 0.22 0.02 0.01
Urban land	Not rated		Not rated		Not rated	
4585:						
Spillville, occasionally flooded	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul) Flooding	1.00 0.60	Depth to saturated zone (Nov-Jul) Flooding	1.00 1.00	Depth to saturated zone (Nov-Jul) Flooding	1.00 0.60

Table 17a.--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
4585:						
Coland, occasionally flooded	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Leaching	0.70	Flooding	1.00	Flooding	0.60
	Flooding	0.60				
Urban land	Not rated		Not rated		Not rated	
4761:						
Franklin	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Too acid	0.08	Too acid	0.31	Too acid	0.31
Urban land	Not rated		Not rated		Not rated	
4771B:						
Waubeek	Not limited		Not limited		Somewhat limited	
					Too steep for surface application	0.08
Urban land	Not rated		Not rated		Not rated	
4771D:						
Waubeek	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.04	Slope	0.04	Too steep for surface application	1.00
					Too steep for sprinkler application	0.22
Urban land	Not rated		Not rated		Not rated	
4798:						
Protivin	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Restricted permeability	0.30	Restricted permeability	0.22	Restricted permeability	0.22
	Too acid	0.02	Too acid	0.07	Too acid	0.07
Urban land	Not rated		Not rated		Not rated	
4911B:						
Colo	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Flooding	1.00	Flooding	1.00	Flooding	1.00
	Leaching	0.70				

Table 17a.--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
4911B:						
Ely	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
					Too steep for surface application	0.08
Urban land	Not rated		Not rated		Not rated	
4933:						
Sawmill, occasionally flooded	Very limited		Very limited		Very limited	
	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Leaching	0.70	Flooding	1.00	Flooding	0.60
	Flooding	0.60				
Urban land	Not rated		Not rated		Not rated	
4946:						
Orthents, loamy	Not rated		Not rated		Not rated	
Urban land	Not rated		Not rated		Not rated	
5010:						
Pits, sand and gravel	Not rated		Not rated		Not rated	
5030:						
Pits, limestone quarries	Not rated		Not rated		Not rated	
5040:						
Orthents, loamy	Not rated		Not rated		Not rated	
5053:						
Psammaquents, frequently flooded	Not rated		Not rated		Not rated	
5080:						
Orthents, sanitary landfill	Not rated		Not rated		Not rated	
AW:						
Animal waste	Not rated		Not rated		Not rated	
SL:						
Sewage lagoon	Not rated		Not rated		Not rated	
W:						
Water	Not rated		Not rated		Not rated	

Table 17b.--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. "Not rated" indicates that data are not available or that no rating is applicable. See text for further explanation of ratings in this table)

Map symbol and soil name	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
7:						
Wiota	Very limited		Very limited		Very limited	
	Seepage	1.00	Restricted permeability	1.00	Filtering capacity	1.00
41:						
Sparta	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Restricted permeability	0.32	Filtering capacity	1.00
	Too acid	0.07			Too acid	0.07
41B:						
Sparta	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Restricted permeability	0.32	Filtering capacity	1.00
	Too acid	0.07			Too steep for surface application	0.08
					Too acid	0.07
41C:						
Sparta	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Slope	0.88	Filtering capacity	1.00
	Too acid	0.07	Restricted permeability	0.32	Too steep for surface application	0.92
	Too steep for surface application	0.06			Too acid	0.07
					Too steep for sprinkler application	0.06
41D:						
Sparta	Very limited		Very limited		Very limited	
	Seepage	1.00	Slope	1.00	Filtering capacity	1.00
	Too steep for surface application	1.00	Restricted permeability	0.32	Too steep for surface application	1.00
	Too acid	0.07			Too steep for sprinkler application	1.00
					Too acid	0.07
63B:						
Chelsea	Very limited		Not limited		Very limited	
	Seepage	1.00			Filtering capacity	1.00
					Too steep for surface application	0.08

Table 17b.--Agricultural Waste Management--Continued

Map symbol and soil name	Overland flow of wastewater: Rating class and limiting features	Value	Rapid infiltration of wastewater: Rating class and limiting features	Value	Slow rate treatment of wastewater: Rating class and limiting features	Value
63C:						
Chelsea	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Slope	0.88	Filtering capacity	1.00
	Too steep for surface application	0.06			Too steep for surface application	0.92
					Too steep for sprinkler application	0.06
63D:						
Chelsea	Very limited		Very limited		Very limited	
	Seepage	1.00	Slope	1.00	Filtering capacity	1.00
	Too steep for surface application	1.00			Too steep for surface application	1.00
					Too steep for sprinkler application	1.00
83B:						
Kenyon	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Too steep for surface application	0.08
			Restricted permeability	1.00		
83C:						
Kenyon	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Too steep for surface application	0.92
	Too steep for surface application	0.06	Restricted permeability	1.00	Too steep for sprinkler application	0.06
			Slope	0.88		
83C2:						
Kenyon, moderately eroded	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Too steep for surface application	0.92
	Too steep for surface application	0.06	Restricted permeability	1.00	Too steep for sprinkler application	0.06
			Slope	0.88		
83D2:						
Kenyon, moderately eroded	Very limited		Very limited		Very limited	
	Seepage	1.00	Slope	1.00	Too steep for surface application	1.00
	Too steep for surface application	1.00	Depth to saturated zone	1.00	Too steep for sprinkler application	1.00
			Restricted permeability	1.00		

Table 17b.--Agricultural Waste Management--Continued

Map symbol and soil name	Overland flow of wastewater: Rating class and limiting features	Value	Rapid infiltration of wastewater: Rating class and limiting features	Value	Slow rate treatment of wastewater: Rating class and limiting features	Value
84:						
Clyde	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Restricted permeability	1.00		
88:						
Nevin	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Restricted permeability	1.00		
	Flooding	0.40				
133:						
Colo, occasionally flooded	Very limited		Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage	1.00	Restricted permeability	1.00	Flooding	0.60
	Depth to saturated zone	1.00	Flooding	0.60		
135:						
Coland, occasionally flooded	Very limited		Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage	1.00	Restricted permeability	1.00	Flooding	0.60
	Depth to saturated zone	1.00	Flooding	0.60		
159:						
Finchford	Very limited		Not limited		Very limited	
	Seepage	1.00			Filtering capacity	1.00
159C:						
Finchford	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Slope	0.50	Filtering capacity	1.00
					Too steep for surface application	0.68
171B:						
Bassett	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Restricted permeability	1.00	Too steep for surface application	0.08
	Too acid	0.07			Too acid	0.07
175:						
Dickinson	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Restricted permeability	0.32	Filtering capacity	1.00

Table 17b.--Agricultural Waste Management--Continued

Map symbol and soil name	Overland flow of wastewater: Rating class and limiting features	Value	Rapid infiltration of wastewater: Rating class and limiting features	Value	Slow rate treatment of wastewater: Rating class and limiting features	Value
175B:						
Dickinson	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Restricted permeability	0.32	Filtering capacity	1.00
					Too steep for surface application	0.08
177:						
Saude	Very limited		Very limited		Very limited	
	Seepage	1.00	Restricted permeability	1.00	Filtering capacity	1.00
177B:						
Saude	Very limited		Very limited		Very limited	
	Seepage	1.00	Restricted permeability	1.00	Filtering capacity	1.00
					Too steep for surface application	0.08
178:						
Waukee	Very limited		Very limited		Very limited	
	Seepage	1.00	Restricted permeability	1.00	Filtering capacity	1.00
	Too acid	0.14			Too acid	0.14
178B:						
Waukee	Very limited		Very limited		Very limited	
	Seepage	1.00	Restricted permeability	1.00	Filtering capacity	1.00
	Too acid	0.14			Too acid	0.14
					Too steep for surface application	0.08
184:						
Klinger	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Restricted permeability	1.00	Too acid	0.07
	Too acid	0.07				
198B:						
Floyd	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Restricted permeability	1.00	Filtering capacity	0.01
213B:						
Rockton, 30 to 40 inches to limestone	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
	Depth to bedrock	1.00	Restricted permeability	1.00	Too acid	0.42
	Too acid	0.42			Too steep for surface application	0.08

Table 17b.--Agricultural Waste Management--Continued

Map symbol and soil name	Overland flow of wastewater: Rating class and limiting features	Value	Rapid infiltration of wastewater: Rating class and limiting features	Value	Slow rate treatment of wastewater: Rating class and limiting features	Value
221:						
Klossner------------	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	Restricted permeability	1.00	Too acid	0.07
	Too acid	0.07				
284:						
Flagler-------------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Restricted permeability	0.32	Filtering capacity	1.00
284B:						
Flagler-------------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Restricted permeability	0.32	Filtering capacity	1.00
					Too steep for surface application	0.08
290:						
Dells---------------	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Filtering capacity	1.00
	Depth to saturated zone	1.00	Restricted permeability	1.00	Depth to saturated zone	1.00
354:						
Aquolls, ponded-----	Not rated		Not rated		Not rated	
377B:						
Dinsdale------------	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Too steep for surface application	0.08
	Too acid	0.07	Restricted permeability	1.00	Too acid	0.07
377C:						
Dinsdale------------	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Too steep for surface application	0.92
	Too acid	0.07	Restricted permeability	1.00	Too acid	0.07
	Too steep for surface application	0.06	Slope	0.88	Too steep for sprinkler application	0.06
377C2:						
Dinsdale, moderately eroded-------------	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Too steep for surface application	0.92
	Too acid	0.07	Restricted permeability	1.00	Too acid	0.07
	Too steep for surface application	0.06	Slope	0.88	Too steep for sprinkler application	0.06

Table 17b.--Agricultural Waste Management--Continued

Map symbol and soil name	Overland flow of wastewater: Rating class and limiting features	Value	Rapid infiltration of wastewater: Rating class and limiting features	Value	Slow rate treatment of wastewater: Rating class and limiting features	Value
382:						
Maxfield------------	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Restricted permeability	1.00		
391B:						
Clyde---------------	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Restricted permeability	1.00		
Floyd---------------	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Restricted permeability	1.00	Filtering capacity	0.01
395B:						
Marquis-------------	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Restricted permeability	1.00	Too steep for surface application	0.08
398:						
Tripoli-------------	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Restricted permeability	1.00		
399:						
Readlyn-------------	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Restricted permeability	1.00	Too acid	0.07
	Too acid	0.07				
408B:						
Olin----------------	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Restricted permeability	1.00	Too steep for surface application	0.08
					Filtering capacity	0.01
408C:						
Olin----------------	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Restricted permeability	1.00	Too steep for surface application	0.92
	Too steep for surface application	0.06	Slope	0.88	Too steep for sprinkler application	0.06
					Filtering capacity	0.01

Table 17b.--Agricultural Waste Management--Continued

Map symbol and soil name	Overland flow of wastewater: Rating class and limiting features	Value	Rapid infiltration of wastewater: Rating class and limiting features	Value	Slow rate treatment of wastewater: Rating class and limiting features	Value
412C:						
Emeline	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
	Depth to bedrock	1.00	Slope	0.50	Too steep for surface application	0.68
426B:						
Aredale	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Restricted permeability	1.00	Restricted permeability	0.15
					Too steep for surface application	0.08
					Filtering capacity	0.01
426C:						
Aredale	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Restricted permeability	1.00	Too steep for surface application	0.92
	Too steep for surface application	0.06	Slope	0.88	Restricted permeability	0.15
					Too steep for sprinkler application	0.06
					Filtering capacity	0.01
426C2:						
Aredale, moderately eroded	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Restricted permeability	1.00	Too steep for surface application	0.92
	Too steep for surface application	0.06	Slope	0.08	Restricted permeability	0.15
					Too steep for sprinkler application	0.06
					Filtering capacity	0.01
468B:						
Dunkerton	Very limited		Very limited		Very limited	
	Seepage	1.00	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Restricted permeability	0.15
					Too steep for surface application	0.08
					Filtering capacity	0.01

Table 17b.--Agricultural Waste Management--Continued

Map symbol and soil name	Overland flow of wastewater: Rating class and limiting features	Value	Rapid infiltration of wastewater: Rating class and limiting features	Value	Slow rate treatment of wastewater: Rating class and limiting features	Value
468C:						
Dunkerton	Very limited		Very limited		Very limited	
	Seepage	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 steep for surface application	0.92
	Too steep for surface application	0.06	Slope	0.88	Restricted permeability	0.15
					Too steep for sprinkler application	0.06
					Filtering capacity	0.01
471:						
Oran	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Restricted permeability	1.00	Too acid	0.07
	Too acid	0.07				
485:						
Spillville, occasionally flooded	Very limited		Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage	1.00	Restricted permeability	1.00	Flooding	0.60
	Depth to saturated zone	1.00	Flooding	0.60		
585:						
Spillville, occasionally flooded	Very limited		Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage	1.00	Restricted permeability	1.00	Flooding	0.60
	Depth to saturated zone	1.00	Flooding	0.60		
Coland, occasionally flooded	Very limited		Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage	1.00	Restricted permeability	1.00	Flooding	0.60
	Depth to saturated zone	1.00	Flooding	0.60		
626:						
Hayfield, 24 to 40 inches to sand and gravel	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Filtering capacity	1.00
	Depth to saturated zone	1.00	Restricted permeability	1.00	Depth to saturated zone	1.00

Table 17b.--Agricultural Waste Management--Continued

Map symbol and soil name	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
761:						
Franklin	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Restricted permeability	1.00	Too acid	0.31
	Too acid	0.31				
771B:						
Waubeek	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Too steep for surface application	0.08
			Restricted permeability	1.00		
775B:						
Billett	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Restricted permeability	0.32	Filtering capacity	1.00
	Too acid	0.07			Too steep for surface application	0.08
					Too acid	0.07
776C:						
Lilah	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Slope	0.50	Filtering capacity	1.00
	Too acid	0.67	Restricted permeability	0.32	Too steep for surface application	0.68
					Too acid	0.67
777:						
Wapsie	Very limited		Very limited		Very limited	
	Seepage	1.00	Restricted permeability	1.00	Filtering capacity	1.00
781B:						
Lourdes	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Restricted permeability	1.00	Restricted permeability	0.15
			Depth to saturated zone	1.00	Too steep for surface application	0.08
781C2:						
Lourdes, moderately eroded	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Restricted permeability	1.00	Too steep for surface application	0.92
	Too steep for surface application	0.06	Depth to saturated zone	1.00	Restricted permeability	0.15
			Slope	0.88	Too steep for sprinkler application	0.06

Table 17b.--Agricultural Waste Management--Continued

Map symbol and soil name	Overland flow of wastewater: Rating class and limiting features	Value	Rapid infiltration of wastewater: Rating class and limiting features	Value	Slow rate treatment of wastewater: Rating class and limiting features	Value
782B:						
Donnan	Very limited		Very limited		Very limited	
	Seepage	1.00	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Restricted permeability	1.00
	Too acid	0.07			Too steep for surface application	0.08
					Too acid	0.07
798:						
Protivin	Very limited		Very limited		Very limited	
	Seepage	1.00	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Restricted permeability	0.15
	Too acid	0.07			Too acid	0.07
809B:						
Bertram	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
	Depth to bedrock	1.00	Restricted permeability	0.32	Too steep for surface application	0.08
					Filtering capacity	0.01
877B:						
Dinsmore	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Too steep for surface application	0.08
	Too acid	0.07	Restricted permeability	1.00	Too acid	0.07
884:						
Klingmore	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Restricted permeability	1.00	Too acid	0.07
	Too acid	0.07				
911B:						
Colo	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Restricted permeability	1.00		
Ely	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Restricted permeability	1.00	Too steep for surface application	0.08

Table 17b.--Agricultural Waste Management--Continued

Map symbol and soil name	Overland flow of wastewater: Rating class and limiting features	Value	Rapid infiltration of wastewater: Rating class and limiting features	Value	Slow rate treatment of wastewater: Rating class and limiting features	Value
933:						
Sawmill, occasionally flooded	Very limited		Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage	1.00	Restricted permeability	1.00	Flooding	0.60
	Depth to saturated zone	1.00	Flooding	0.60		
982:						
Maxmore	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Restricted permeability	1.00		
1152:						
Marshan, 24 to 40 inches to sand and gravel	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Filtering capacity	1.00
	Depth to saturated zone	1.00	Restricted permeability	1.00	Depth to saturated zone	1.00
1226:						
Lawler, 24 to 40 inches to sand and gravel	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Filtering capacity	1.00
	Depth to saturated zone	1.00	Restricted permeability	1.00	Depth to saturated zone	1.00
1285G:						
Burkhardt	Very limited		Very limited		Very limited	
	Seepage	1.00	Slope	1.00	Filtering capacity	1.00
	Too steep for surface application	1.00	Restricted permeability	0.32	Too steep for surface application	1.00
	Too acid	0.67			Too steep for sprinkler application	1.00
					Too acid	0.67
Bassett	Very limited		Very limited		Very limited	
	Seepage	1.00	Slope	1.00	Too steep for surface application	1.00
	Too steep for surface application	1.00	Depth to saturated zone	1.00	Too steep for sprinkler application	1.00
	Depth to saturated zone	1.00	Restricted permeability	1.00	Depth to saturated zone	1.00
	Too acid	0.07			Too acid	0.07

Table 17b.--Agricultural Waste Management--Continued

Map symbol and soil name	Overland flow of wastewater: Rating class and limiting features	Value	Rapid infiltration of wastewater: Rating class and limiting features	Value	Slow rate treatment of wastewater: Rating class and limiting features	Value
1285G:						
Chelsea	Very limited		Very limited		Very limited	
	Seepage	1.00	Slope	1.00	Filtering capacity	1.00
	Too steep for surface application	1.00			Too steep for surface application	1.00
					Too steep for sprinkler application	1.00
1585:						
Spillville, frequently flooded	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
	Seepage	1.00	Depth to saturated zone	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Restricted permeability	1.00		
Coland, frequently flooded	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
	Seepage	1.00	Depth to saturated zone	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Restricted permeability	1.00		
Aquolls, ponded	Not rated		Not rated		Not rated	
1586:						
Sigglekov, frequently flooded	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Filtering capacity	1.00
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Restricted permeability	0.32	Flooding	1.00
	Too acid	0.14			Too acid	0.14
Fluvaquents, frequently flooded	Very limited		Very limited		Very limited	
	Not rated; pH		Flooding	1.00	Depth to saturated zone	1.00
	Flooding	1.00	Depth to saturated zone	1.00	Flooding	1.00
	Depth to saturated zone	1.00				
Aquents, ponded	Not rated		Not rated		Not rated	
4000:						
Urban land	Not rated		Not rated		Not rated	
4007:						
Wiota	Very limited		Very limited		Very limited	
	Seepage	1.00	Restricted permeability	1.00	Filtering capacity	1.00
Urban land	Not rated		Not rated		Not rated	

Table 17b.--Agricultural Waste Management--Continued

Map symbol and soil name	Overland flow of wastewater: Rating class and limiting features	Value	Rapid infiltration of wastewater: Rating class and limiting features	Value	Slow rate treatment of wastewater: Rating class and limiting features	Value
4041:						
Sparta	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Restricted permeability	0.32	Filtering capacity	1.00
	Too acid	0.07			Too acid	0.07
Urban land	Not rated		Not rated		Not rated	
4041B:						
Sparta	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Restricted permeability	0.32	Filtering capacity	1.00
	Too acid	0.07			Too steep for surface application	0.08
					Too acid	0.07
Urban land	Not rated		Not rated		Not rated	
4041C:						
Sparta	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Slope	0.88	Filtering capacity	1.00
	Too acid	0.07	Restricted permeability	0.32	Too steep for surface application	0.92
	Too steep for surface application	0.06			Too acid	0.07
					Too steep for sprinkler application	0.06
Urban land	Not rated		Not rated		Not rated	
4041D:						
Sparta	Very limited		Very limited		Very limited	
	Seepage	1.00	Slope	1.00	Filtering capacity	1.00
	Too steep for surface application	1.00	Restricted permeability	0.32	Too steep for surface application	1.00
	Too acid	0.07			Too steep for sprinkler application	1.00
					Too acid	0.07
Urban land	Not rated		Not rated		Not rated	
4063B:						
Chelsea	Very limited		Not limited		Very limited	
	Seepage	1.00			Filtering capacity	1.00
					Too steep for surface application	0.08
Urban land	Not rated		Not rated		Not rated	

Table 17b.--Agricultural Waste Management--Continued

Map symbol and soil name	Overland flow of wastewater: Rating class and limiting features	Value	Rapid infiltration of wastewater: Rating class and limiting features	Value	Slow rate treatment of wastewater: Rating class and limiting features	Value
4063C:						
Chelsea-------------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Slope	0.88	Filtering capacity	1.00
	Too steep for surface application	0.06			Too steep for surface application	0.92
					Too steep for sprinkler application	0.06
Urban land----------	Not rated		Not rated		Not rated	
4063D:						
Chelsea-------------	Very limited		Very limited		Very limited	
	Seepage	1.00	Slope	1.00	Filtering capacity	1.00
	Too steep for surface application	1.00			Too steep for surface application	1.00
					Too steep for sprinkler application	1.00
Urban land----------	Not rated		Not rated		Not rated	
4083B:						
Kenyon--------------	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Too steep for surface application	0.08
			Restricted permeability	1.00		
Urban land----------	Not rated		Not rated		Not rated	
4083C:						
Kenyon--------------	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Too steep for surface application	0.92
	Too steep for surface application	0.06	Restricted permeability	1.00	Too steep for sprinkler application	0.06
			Slope	0.88		
Urban land----------	Not rated		Not rated		Not rated	
4083D:						
Kenyon--------------	Very limited		Very limited		Very limited	
	Seepage	1.00	Slope	1.00	Too steep for surface application	1.00
	Too steep for surface application	1.00	Depth to saturated zone	1.00	Too steep for sprinkler application	1.00
			Restricted permeability	1.00		
Urban land----------	Not rated		Not rated		Not rated	

Table 17b.--Agricultural Waste Management--Continued

Map symbol and soil name	Overland flow of wastewater: Rating class and limiting features	Value	Rapid infiltration of wastewater: Rating class and limiting features	Value	Slow rate treatment of wastewater: Rating class and limiting features	Value
4084:						
Clyde	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Restricted permeability	1.00		
Urban land	Not rated		Not rated		Not rated	
4088:						
Nevin	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Restricted permeability	1.00		
	Flooding	0.40				
Urban land	Not rated		Not rated		Not rated	
4133:						
Colo, occasionally flooded	Very limited		Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage	1.00	Restricted permeability	1.00	Flooding	0.60
	Depth to saturated zone	1.00	Flooding	0.60		
Urban land	Not rated		Not rated		Not rated	
4135:						
Coland, occasionally flooded	Very limited		Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage	1.00	Restricted permeability	1.00	Flooding	0.60
	Depth to saturated zone	1.00	Flooding	0.60		
Urban land	Not rated		Not rated		Not rated	
4152:						
Marshan, 24 to 40 inches to sand and gravel	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Filtering capacity	1.00
	Depth to saturated zone	1.00	Restricted permeability	1.00	Depth to saturated zone	1.00
Urban land	Not rated		Not rated		Not rated	
4159:						
Finchford	Very limited		Not limited		Very limited	
	Seepage	1.00			Filtering capacity	1.00
Urban land	Not rated		Not rated		Not rated	

Table 17b.--Agricultural Waste Management--Continued

Map symbol and soil name	Overland flow of wastewater: Rating class and limiting features	Value	Rapid infiltration of wastewater: Rating class and limiting features	Value	Slow rate treatment of wastewater: Rating class and limiting features	Value
4159C:						
Finchford	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Slope	0.50	Filtering capacity	1.00
					Too steep for surface application	0.68
Urban land	Not rated		Not rated		Not rated	
4171B:						
Bassett	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Restricted permeability	1.00	Too steep for surface application	0.08
	Too acid	0.07			Too acid	0.07
Urban land	Not rated		Not rated		Not rated	
4171D:						
Bassett	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Too steep for surface application	1.00
	Too steep for surface application	1.00	Restricted permeability	1.00	Too steep for sprinkler application	1.00
	Depth to saturated zone	1.00	Slope	1.00	Depth to saturated zone	1.00
	Too acid	0.07			Too acid	0.07
Urban land	Not rated		Not rated		Not rated	
4175:						
Dickinson	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Restricted permeability	0.32	Filtering capacity	1.00
Urban land	Not rated		Not rated		Not rated	
4175B:						
Dickinson	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Restricted permeability	0.32	Filtering capacity	1.00
					Too steep for surface application	0.08
Urban land	Not rated		Not rated		Not rated	
4177:						
Saude	Very limited		Very limited		Very limited	
	Seepage	1.00	Restricted permeability	1.00	Filtering capacity	1.00
Urban land	Not rated		Not rated		Not rated	

Table 17b.--Agricultural Waste Management--Continued

Map symbol and soil name	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4177B:						
Saude	Very limited		Very limited		Very limited	
	Seepage	1.00	Restricted permeability	1.00	Filtering capacity	1.00
					Too steep for surface application	0.08
Urban land	Not rated		Not rated		Not rated	
4178:						
Waukee	Very limited		Very limited		Very limited	
	Seepage	1.00	Restricted permeability	1.00	Filtering capacity	1.00
	Too acid	0.14			Too acid	0.14
Urban land	Not rated		Not rated		Not rated	
4184:						
Klinger	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Restricted permeability	1.00	Too acid	0.07
	Too acid	0.07				
Urban land	Not rated		Not rated		Not rated	
4198B:						
Floyd	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Restricted permeability	1.00	Filtering capacity	0.01
Urban land	Not rated		Not rated		Not rated	
4226:						
Lawler, 24 to 40 inches to sand and gravel	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Filtering capacity	1.00
	Depth to saturated zone	1.00	Restricted permeability	1.00	Depth to saturated zone	1.00
Urban land	Not rated		Not rated		Not rated	
4284:						
Flagler	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Restricted permeability	0.32	Filtering capacity	1.00
Urban land	Not rated		Not rated		Not rated	

Table 17b.--Agricultural Waste Management--Continued

Map symbol and soil name	Overland flow of wastewater: Rating class and limiting features	Value	Rapid infiltration of wastewater: Rating class and limiting features	Value	Slow rate treatment of wastewater: Rating class and limiting features	Value
4284B:						
Flagler-------------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Restricted permeability	0.32	Filtering capacity	1.00
					Too steep for surface application	0.08
Urban land----------	Not rated		Not rated		Not rated	
4377B:						
Dinsdale------------	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Too steep for surface application	0.08
	Too acid	0.07	Restricted permeability	1.00	Too acid	0.07
Urban land----------	Not rated		Not rated		Not rated	
4377C:						
Dinsdale------------	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Too steep for surface application	0.92
	Too acid	0.07	Restricted permeability	1.00	Too acid	0.07
	Too steep for surface application	0.06	Slope	0.88	Too steep for sprinkler application	0.06
Urban land----------	Not rated		Not rated		Not rated	
4382:						
Maxfield------------	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Restricted permeability	1.00		
Urban land----------	Not rated		Not rated		Not rated	
4391B:						
Clyde---------------	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Restricted permeability	1.00		
Floyd---------------	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Restricted permeability	1.00	Filtering capacity	0.01
Urban land----------	Not rated		Not rated		Not rated	

Table 17b.--Agricultural Waste Management--Continued

Map symbol and soil name	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4398:						
Tripoli	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Restricted permeability	1.00		
Urban land	Not rated		Not rated		Not rated	
4399:						
Readlyn	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Restricted permeability	1.00	Too acid	0.07
	Too acid	0.07				
Urban land	Not rated		Not rated		Not rated	
4408B:						
Olin	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Restricted permeability	1.00	Too steep for surface application	0.08
					Filtering capacity	0.01
Urban land	Not rated		Not rated		Not rated	
4408C:						
Olin	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Restricted permeability	1.00	Too steep for surface application	0.92
	Too steep for surface application	0.06	Slope	0.88	Too steep for sprinkler application	0.06
					Filtering capacity	0.01
Urban land	Not rated		Not rated		Not rated	
4426B:						
Aredale	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Restricted permeability	1.00	Restricted permeability	0.15
					Too steep for surface application	0.08
					Filtering capacity	0.01
Urban land	Not rated		Not rated		Not rated	

Table 17b.--Agricultural Waste Management--Continued

Map symbol and soil name	Overland flow of wastewater: Rating class and limiting features	Value	Rapid infiltration of wastewater: Rating class and limiting features	Value	Slow rate treatment of wastewater: Rating class and limiting features	Value
4426C:						
Aredale-------------	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Restricted permeability	1.00	Too steep for surface application	0.92
	Too steep for surface application	0.06	Slope	0.88	Restricted permeability	0.15
					Too steep for sprinkler application	0.06
					Filtering capacity	0.01
Urban land----------	Not rated		Not rated		Not rated	
4585:						
Spillville, occasionally flooded------------	Very limited		Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage	1.00	Restricted permeability	1.00	Flooding	0.60
	Depth to saturated zone	1.00	Flooding	0.60		
Coland, occasionally flooded------------	Very limited		Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage	1.00	Restricted permeability	1.00	Flooding	0.60
	Depth to saturated zone	1.00	Flooding	0.60		
Urban land----------	Not rated		Not rated		Not rated	
4761:						
Franklin------------	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Restricted permeability	1.00	Too acid	0.31
	Too acid	0.31				
Urban land----------	Not rated		Not rated		Not rated	
4771B:						
Waubeek-------------	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Too steep for surface application	0.08
			Restricted permeability	1.00		
Urban land----------	Not rated		Not rated		Not rated	

Table 17b.--Agricultural Waste Management--Continued

Map symbol and soil name	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4771D:						
Waubeek	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Too steep for surface application	1.00
	Too steep for surface application	0.50	Restricted permeability	1.00	Too steep for sprinkler application	0.50
			Slope	1.00		
Urban land	Not rated		Not rated		Not rated	
4798:						
Protivin	Very limited		Very limited		Very limited	
	Seepage	1.00	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Restricted permeability	0.15
	Too acid	0.07			Too acid	0.07
Urban land	Not rated		Not rated		Not rated	
4911B:						
Colo	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
	Seepage	1.00	Depth to saturated zone	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Restricted permeability	1.00		
Ely	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Restricted permeability	1.00	Too steep for surface application	0.08
Urban land	Not rated		Not rated		Not rated	
4933:						
Sawmill, occasionally flooded	Very limited		Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage	1.00	Restricted permeability	1.00	Flooding	0.60
	Depth to saturated zone	1.00	Flooding	0.60		
Urban land	Not rated		Not rated		Not rated	
4946:						
Orthents, loamy	Not rated		Not rated		Not rated	
Urban land	Not rated		Not rated		Not rated	
5010:						
Pits, sand and gravel	Not rated		Not rated		Not rated	

Table 17b.--Agricultural Waste Management--Continued

Map symbol and soil name	Overland flow of wastewater: Rating class and limiting features	Value	Rapid infiltration of wastewater: Rating class and limiting features	Value	Slow rate treatment of wastewater: Rating class and limiting features	Value
5030:						
Pits, limestone quarries-----------	Not rated		Not rated		Not rated	
5040:						
Orthents, loamy-----	Not rated		Not rated		Not rated	
5053:						
Psammaquents, frequently flooded	Not rated		Not rated		Not rated	
5080:						
Orthents, sanitary landfill-----------	Not rated		Not rated		Not rated	
AW:						
Animal waste--------	Not rated		Not rated		Not rated	
SL:						
Sewage lagoon-------	Not rated		Not rated		Not rated	
W:						
Water---------------	Not rated		Not rated		Not rated	

Table 18.--Engineering Index Properties

(Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
7:												
Wiota-----------	0-8	Silt loam, silty clay loam	CL	A-6	0	0	100	100	100	90-95	25-35	10-20
	8-22	Silt loam, silty clay loam	CL	A-6	0	0	100	100	100	90-95	25-35	10-20
	22-28	Silty clay loam	CL	A-7	0	0	100	100	95-100	85-95	40-50	15-25
	28-48	Silty clay loam	CL	A-7	0	0	100	100	95-100	85-95	40-50	15-25
	48-54	Silt loam, silty clay loam	CL	A-7, A-6	0	0	100	100	95-100	85-95	30-50	15-30
	54-80	Sand, loamy sand	SC-SM, SM	A-2-4, A-3	0	0	100	95-100	60-80	5-20	10-20	NP-5
41:												
Sparta----------	0-11	Sand, fine sand, loamy sand, loamy fine sand	SM	A-2-4, A-3	0	0	95-100	90-100	50-95	5-35	0-14	NP
	11-15	Sand, fine sand, loamy sand, loamy fine sand	SM	A-2-4, A-3	0	0	95-100	90-100	50-95	5-35	0-14	NP
	15-34	Sand, loamy sand, loamy fine sand, fine sand	SP-SM, SM	A-2-4, A-3	0	0	95-100	90-100	50-95	5-35	0-14	NP
	34-60	Sand, fine sand	SP-SM, SM, SP	A-2-4, A-3	0	0	95-100	90-100	50-95	2-20	0-14	NP

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
41B:												
Sparta----------	0-11	Sand, fine sand, loamy sand, loamy fine sand	SM	A-2-4, A-3	0	0	95-100	90-100	50-95	5-35	0-14	NP
	11-15	Sand, fine sand, loamy sand, loamy fine sand	SM	A-2-4, A-3	0	0	95-100	90-100	50-95	5-35	0-14	NP
	15-34	Sand, loamy sand, loamy fine sand, fine sand	SP-SM, SM	A-2-4, A-3	0	0	95-100	90-100	50-95	5-35	0-14	NP
	34-60	Sand, fine sand	SP-SM, SM, SP	A-2-4, A-3	0	0	95-100	90-100	50-95	2-20	0-14	NP
41C:												
Sparta----------	0-9	Sand, fine sand, loamy sand, loamy fine sand	SM	A-2-4, A-3	0	0	95-100	90-100	50-95	5-35	0-14	NP
	9-14	Sand, fine sand, loamy sand, loamy fine sand	SM	A-2-4, A-3	0	0	95-100	90-100	50-95	5-35	0-14	NP
	14-32	Sand, loamy sand, loamy fine sand, fine sand	SP-SM, SM	A-2-4, A-3	0	0	95-100	90-100	50-95	5-35	0-14	NP
	32-60	Sand, fine sand	SP-SM, SM, SP	A-2-4, A-3	0	0	95-100	90-100	50-95	2-20	0-14	NP
41D:												
Sparta----------	0-9	Sand, fine sand, loamy sand, loamy fine sand	SM	A-2-4, A-3	0	0	95-100	90-100	50-95	5-35	0-14	NP
	9-14	Sand, fine sand, loamy sand, loamy fine sand	SM	A-2-4, A-3	0	0	95-100	90-100	50-95	5-35	0-14	NP
	14-30	Sand, loamy sand, loamy fine sand, fine sand	SP-SM, SM	A-2-4, A-3	0	0	95-100	90-100	50-95	5-35	0-14	NP
	30-60	Sand, fine sand	SP-SM, SM, SP	A-2-4, A-3	0	0	95-100	90-100	50-95	2-20	0-14	NP

Table 18.--Engineering Index Properties--Continued

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	
63B:												
Chelsea---------	0-8	Fine sand, loamy fine sand	SM, SP-SM	A-2-4	0	0	100	100	65-80	10-35	0-14	NP
	8-36	Loamy fine sand, fine sand	SM, SP, SP-SM	A-3, A-2-4	0	0	100	100	65-85	3-15	0-14	NP
	36-70	Loamy fine sand, fine sandy loam, loamy sand, fine sand, sandy loam	SM, SP, SP-SM	A-3, A-2-4	0	0	100	100	65-85	3-15	0-14	NP
63C:												
Chelsea---------	0-8	Fine sand, loamy fine sand	SM, SP-SM	A-2-4	0	0	100	100	65-80	10-35	0-14	NP
	8-36	Loamy fine sand, fine sand	SM, SP, SP-SM	A-3, A-2-4	0	0	100	100	65-85	3-15	0-14	NP
	36-70	Loamy fine sand, fine sandy loam, loamy sand, fine sand, sandy loam	SM, SP, SP-SM	A-3, A-2-4	0	0	100	100	65-85	3-15	0-14	NP
63D:												
Chelsea---------	0-8	Fine sand, loamy fine sand	SM, SP-SM	A-2-4	0	0	100	100	65-80	10-35	0-14	NP
	8-32	Loamy fine sand, fine sand	SM, SP, SP-SM	A-3, A-2-4	0	0	100	100	65-85	3-15	0-14	NP
	32-70	Fine sand, sandy loam, loamy fine sand, fine sandy loam, loamy sand	SM, SP, SP-SM	A-3, A-2-4	0	0	100	100	65-85	3-15	0-14	NP

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
83B:												
Kenyon----------	0-8	Loam, silt loam	CL	A-6	0	0-5	95-100	95-100	85-95	65-75	30-40	10-20
	8-14	Loam, silt loam	CL	A-6	0	0-5	95-100	95-100	85-95	65-75	30-40	10-20
	14-19	Loam, sandy clay loam, silt loam	CL	A-6	0	0-5	95-100	95-100	85-95	65-75	30-40	10-20
	19-47	Loam, clay loam, sandy clay loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	30-40	10-20
	47-54	Loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	25-35	10-20
	54-76	Loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	25-35	10-20
83C:												
Kenyon----------	0-8	Loam, silt loam	CL	A-6	0	0-5	95-100	95-100	85-95	65-75	30-40	10-20
	8-14	Loam, silt loam	CL	A-6	0	0-5	95-100	95-100	85-95	65-75	30-40	10-20
	14-19	Loam, sandy clay loam, silt loam	CL	A-6	0	0-5	95-100	95-100	85-95	65-75	30-40	10-20
	19-47	Loam, clay loam, sandy clay loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	30-40	10-20
	47-54	Loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	25-35	10-20
	54-76	Loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	25-35	10-20
83C2:												
Kenyon, moderately eroded---------	0-8	Loam	CL	A-6	0	0-5	95-100	95-100	85-95	65-75	30-40	10-20
	8-14	Loam, sandy clay loam	CL	A-6	0	0-5	95-100	95-100	85-95	65-75	30-40	10-20
	14-40	Loam, sandy clay loam, clay loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	30-40	10-20
	40-46	Loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	25-35	10-20
	46-76	Loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	25-35	10-20

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
83D2:												
Kenyon, moderately eroded---------	0-8	Loam	CL	A-6	0	0-5	95-100	95-100	85-95	65-75	30-40	10-20
	8-14	Sandy clay loam, loam	CL	A-6	0	0-5	95-100	95-100	85-95	65-75	30-40	10-20
	14-40	Clay loam, sandy clay loam, loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	30-40	10-20
	40-46	Loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	25-35	10-20
	46-76	Loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	25-35	10-20
84:												
Clyde-----------	0-8	Clay loam, silty clay loam, loam	OL, MH, ML, OH	A-7	0	0-5	95-100	95-100	80-90	55-75	45-60	15-25
	8-17	Silty clay loam, clay loam	OL, MH, ML, OH	A-7	0	0-5	95-100	95-100	80-90	55-75	45-60	15-25
	17-23	Clay loam, silty clay loam	OL, MH, ML, OH	A-7	0	0-5	95-100	95-100	80-90	55-75	45-60	15-25
	23-41	Clay loam, silty clay loam	CL, ML	A-6, A-7	0	0-5	95-100	90-95	75-90	50-75	30-50	10-20
	41-44	Sandy loam, loam	SM, SC-SM	A-2-4	0	2-5	85-95	85-95	50-80	15-35	15-20	NP-5
	44-54	Loam, clay loam	CL, SC	A-6	0-5	2-5	90-95	85-95	75-90	45-65	25-35	10-20
	54-66	Clay loam, loam	CL, SC	A-6	0-5	2-5	90-95	85-95	75-90	45-65	25-35	10-20
88:												
Nevin-----------	0-8	Silty clay loam	CL, OL	A-6, A-7	0	0	100	100	100	90-95	35-45	10-20
	8-24	Silty clay loam, silt loam	CL, OL	A-6, A-7	0	0	100	100	100	90-95	35-45	10-20
	24-30	Silt loam, silty clay loam	CL	A-7, A-6	0	0	100	100	95-100	90-95	35-45	10-20
	30-46	Silty clay loam	CL	A-7-6	0	0	100	100	95-100	90-95	40-50	20-30
	46-58	Silty clay loam	CL	A-7-6	0	0	100	100	95-100	90-95	40-50	20-30
	58-80	Loamy sand, sandy loam, sand	SM, SC-SM	A-2-4, A-3	0	0	100	95-100	60-80	5-20	10-18	NP-5

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
133:												
Colo, occasionally flooded--------	0-8	Silt loam, silty clay loam	CL, CH	A-7	0	0	100	100	90-100	90-100	40-60	15-30
	8-34	Silt loam, silty clay loam	CL, CH	A-7	0	0	100	100	90-100	90-100	40-60	15-30
	34-40	Silty clay loam	CL, CH	A-7	0	0	100	100	90-100	90-100	40-60	15-30
	40-46	Silty clay loam	CL, CH	A-7	0	0	100	100	90-100	90-100	40-55	20-30
	46-52	Silty clay loam	CL, CH	A-7	0	0	100	100	90-100	90-100	40-55	20-30
	52-60	Clay loam, silty clay loam, silt loam	CL, CH	A-7	0	0	100	100	95-100	80-100	40-55	15-30
135:												
Coland, occasionally flooded--------	0-8	Clay loam, silty clay loam	CL	A-7-6	0	0	100	100	95-100	65-80	35-50	15-25
	8-32	Clay loam, silty clay loam	CL	A-7-6	0	0	100	100	95-100	65-80	35-50	15-25
	32-40	Clay loam, loam	CL	A-7-6	0	0	100	100	95-100	65-80	35-50	15-25
	40-44	Sandy loam, loam, clay loam	CL, SC, CL-ML, SC-SM	A-4, A-6	0	0	100	90-100	60-70	40-60	20-40	5-15
	44-52	Sandy loam, clay loam, loam	CL, SC, CL-ML, SC-SM	A-4, A-6	0	0	100	90-100	60-70	40-60	20-40	5-15
	52-66	Loam, clay loam, sandy loam	CL, SC, CL-ML, SC-SM	A-4, A-6	0	0	100	90-100	60-70	40-60	20-40	5-15

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
159:												
Finchford-------	0-8	Loamy sand, sandy loam, sand	SM	A-2-4, A-3	0	0	90-95	85-95	50-60	5-15	0-14	NP
	8-18	Loamy sand, sandy loam, sand	SM	A-2-4, A-3	0	0	90-95	85-95	50-60	5-15	0-14	NP
	18-30	Sand, loamy sand, loamy coarse sand, coarse sand	SP-SM	A-1-b	0	0	90-95	85-95	25-40	5-10	0-14	NP
	30-55	Gravelly coarse sand, gravelly sand, sand, coarse sand	SW, SW-SM	A-1	0	0-5	50-75	50-75	20-35	3-5	0-14	NP
	55-70	Coarse sand, gravelly coarse sand, gravelly sand, sand	SW, SW-SM	A-1	0	0-5	50-75	50-75	20-35	3-5	0-14	NP
	70-80	Gravelly coarse sand, gravelly sand, sand, coarse sand	SW, SW-SM	A-1	0	0-5	50-75	50-75	20-35	3-5	0-14	NP

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
159C:												
Finchford-------	0-8	Loamy sand, sandy loam, sand	SM	A-2-4, A-3	0	0	90-95	85-95	50-60	5-15	0-14	NP
	8-15	Loamy sand, sandy loam, sand	SM	A-2-4, A-3	0	0	90-95	85-95	50-60	5-15	0-14	NP
	15-26	Sand, loamy sand, loamy coarse sand, coarse sand	SP-SM	A-1-b	0	0	90-95	85-95	25-40	5-10	0-14	NP
	26-50	Gravelly coarse sand, gravelly sand, sand, coarse sand	SW, SW-SM	A-1	0	0-5	50-75	50-75	20-35	3-5	0-14	NP
	50-65	Coarse sand, gravelly coarse sand, gravelly sand, sand	SW, SW-SM	A-1	0	0-5	50-75	50-75	20-35	3-5	0-14	NP
	65-80	Gravelly coarse sand, gravelly sand, sand, coarse sand	SW, SW-SM	A-1	0	0-5	50-75	50-75	20-35	3-5	0-14	NP
171B:												
Bassett---------	0-8	Silt loam, loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	95-100	85-95	65-85	20-30	5-15
	8-10	Silt loam, loam	CL	A-4, A-6	0	0-5	95-100	95-100	85-95	65-85	20-30	5-15
	10-14	Loam	CL	A-4, A-6	0	0-5	95-100	95-100	85-95	65-85	20-30	5-15
	14-43	Sandy clay loam, clay loam, loam	CL	A-6	0	2-5	90-95	85-95	80-90	50-65	30-40	11-20
	43-59	Loam	CL	A-6	0	2-5	90-95	85-95	80-90	50-65	30-40	11-20
	59-73	Loam	CL	A-6	0	2-5	90-95	85-95	80-90	50-65	30-40	11-20

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
175:												
Dickinson-------	0-9	Loam, sandy loam, fine sandy loam	SM, SC, SC-SM	A-4, A-2	0	0	100	100	85-95	30-50	15-30	NP-10
	9-18	Loam, sandy loam, fine sandy loam	SM, SC, SC-SM	A-4	0	0	100	100	85-95	30-50	15-30	NP-10
	18-30	Sandy loam, fine sandy loam	SM, SC, SC-SM	A-4	0	0	100	100	85-95	35-50	15-30	NP-10
	30-36	Sand, fine sand, loamy fine sand, loamy sand	SM, SC-SM	A-2-4, A-3	0	0	100	100	80-95	5-20	10-20	NP-5
	36-60	Fine sand, loamy fine sand, loamy sand, sand	SM	A-3, A-2	0	0	100	100	70-90	5-15	0-14	NP
175B:												
Dickinson-------	0-9	Loam, sandy loam, fine sandy loam	SM, SC, SC-SM	A-4, A-2	0	0	100	100	85-95	30-50	15-30	NP-10
	9-18	Loam, sandy loam, fine sandy loam	SM, SC, SC-SM	A-4	0	0	100	100	85-95	30-50	15-30	NP-10
	18-30	Sandy loam, fine sandy loam	SM, SC, SC-SM	A-4	0	0	100	100	85-95	35-50	15-30	NP-10
	30-36	Loamy sand, sand, fine sand, loamy fine sand	SM, SC-SM	A-2-4, A-3	0	0	100	100	80-95	5-20	10-20	NP-5
	36-60	Fine sand, loamy fine sand, loamy sand, sand	SM	A-3, A-2	0	0	100	100	70-90	5-15	0-14	NP

Table 18.--Engineering Index Properties--Continued

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	
177:												
Saude	0-7	Loam	CL	A-6	0	0	100	90-100	70-90	50-75	25-35	10-15
	7-13	Loam	CL	A-6	0	0	100	90-100	70-90	50-75	25-35	10-15
	13-16	Loam	CL, CL-ML, SC-SM	A-4, A-6	0	0-3	90-95	90-95	70-90	50-75	20-30	5-15
	16-24	Loam	CL, CL-ML, SC-SM	A-4, A-6	0	0-3	90-95	90-95	70-90	50-75	20-30	5-15
	24-28	Sandy loam	CL, SC, CL-ML, SC-SM	A-4, A-6	0	0-3	90-95	90-95	60-85	45-60	20-30	5-15
	28-36	Loamy sand	SW, SM	A-1-b	0	0-3	85-95	85-95	20-40	3-25	0-14	NP
	36-60	Sand, loamy sand, gravelly coarse sand	SW, SM, GP, GM	A-1-b	0	2-10	50-90	50-85	15-35	3-25	0-14	NP
177B:												
Saude	0-7	Loam	CL	A-6	0	0	100	90-100	70-90	50-75	25-35	10-15
	7-13	Loam	CL	A-6	0	0	100	90-100	70-90	50-75	25-35	10-15
	13-16	Loam	CL, CL-ML, SC-SM	A-4, A-6	0	0-3	90-95	90-95	70-90	50-75	20-30	5-15
	16-24	Loam	CL, CL-ML, SC-SM	A-4, A-6	0	0-3	90-95	90-95	70-90	50-75	20-30	5-15
	24-28	Sandy loam	CL, SC, CL-ML, SC-SM	A-4, A-6	0	0-3	90-95	90-95	60-85	45-60	20-30	5-15
	28-36	Loamy sand	SW, SM	A-1-b	0	0-3	85-95	85-95	20-40	3-25	0-14	NP
	36-60	Sand, loamy sand, gravelly coarse sand	SW, SM, GP, GM	A-1-b	0	2-10	50-90	50-85	15-35	3-25	0-14	NP
178:												
Waukee	0-8	Silt loam, loam	CL	A-6	0	0	100	90-100	70-90	50-75	30-40	10-20
	8-16	Silt loam, loam	CL	A-6	0	0	100	90-100	70-90	50-75	30-40	10-20
	16-20	Loam, sandy clay loam	CL, SC-SM, SC, CL-ML	A-6, A-4	0	0-3	90-95	90-95	65-85	40-60	20-35	5-15
	20-35	Loam, sandy clay loam	CL, SC-SM, SC, CL-ML	A-6, A-4	0	0-3	90-95	90-95	65-85	40-60	20-35	5-15
	35-44	Gravelly loamy coarse sand	SW, SM, SP-SM, SP	A-1-b	0-5	0-10	60-90	60-85	20-40	3-25	0-14	NP
	44-66	Gravelly loamy coarse sand, gravelly sand	SW, SM, SP-SM, SP	A-1-b	0-5	0-10	60-90	60-85	20-40	3-25	0-14	NP

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
178B:												
Waukee----------	0-8	Silt loam, loam	CL	A-6	0	0	100	90-100	70-90	50-75	30-40	10-20
	8-16	Silt loam, loam	CL	A-6	0	0	100	90-100	70-90	50-75	30-40	10-20
	16-20	Loam, sandy clay loam	CL, SC-SM, SC, CL-ML	A-6, A-4	0	0-3	90-95	90-95	65-85	40-60	20-35	5-15
	20-35	Sandy clay loam, loam	CL, SC-SM, SC, CL-ML	A-6, A-4	0	0-3	90-95	90-95	65-85	40-60	20-35	5-15
	35-44	Gravelly loamy coarse sand	SW, SM, SP-SM, SP	A-1-b	0-5	0-10	60-90	60-85	20-40	3-25	0-14	NP
	44-66	Gravelly loamy coarse sand, gravelly sand	SW, SM, SP-SM, SP	A-1-b	0-5	0-10	60-90	60-85	20-40	3-25	0-14	NP
184:												
Klinger---------	0-9	Silt loam, silty clay loam	CL	A-7-6	0	0	100	100	100	95-100	40-50	15-25
	9-13	Silt loam, silty clay loam	CL	A-7-6	0	0	100	100	100	95-100	40-50	15-25
	13-19	Silty clay loam	CL	A-7-6	0	0	100	100	100	95-100	40-50	15-25
	19-31	Silty clay loam	CL	A-7-6	0	0	100	100	100	95-100	40-50	20-30
	31-40	Clay loam, loam	CL	A-6	0	0-5	90-95	85-95	75-85	55-65	25-35	10-20
	40-46	Loam, clay loam	CL	A-6	0	0-5	90-95	85-95	75-85	55-65	25-35	10-20
	46-64	Loam	CL	A-6	0	0-5	90-95	85-95	75-85	55-65	25-35	10-20
198B:												
Floyd-----------	0-8	Clay loam, loam	OL, ML, CL	A-4, A-6	0	0	100	100	80-90	55-75	30-40	5-15
	8-24	Clay loam, loam	OL, ML, CL	A-4, A-6	0	0	100	100	80-90	55-75	30-40	5-15
	24-33	Loam, sandy clay loam	CL	A-6	0	0-5	90-95	85-95	50-70	50-65	25-35	11-20
	33-41	Sandy loam, sandy clay loam, loam	SM, SC-SM	A-2-4	0	0-5	90-95	85-95	50-70	15-35	10-20	NP-5
	41-50	Clay loam, loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	25-35	11-20
	50-60	Clay loam, loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	25-35	11-20

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
213B:												
Rockton, 30 to 40 inches to limestone------	0-10	Silt loam, loam	ML, CL-ML, CL	A-4	0	0	90-100	90-100	85-95	50-75	25-35	5-10
	10-15	Silt loam, loam	ML, CL-ML, CL	A-4	0	0	90-100	90-100	85-95	50-75	25-35	5-10
	15-21	Sandy clay loam, clay loam, loam	CL, SC	A-6, A-7	0	0	90-100	90-100	75-90	45-70	30-45	10-20
	21-30	Loam, clay loam, sandy clay loam	CL, SC	A-6, A-7	0	0	90-100	90-100	75-90	45-70	30-45	10-20
	30-35	Silty clay, silty clay loam, clay	CH, CL	A-7-6	0	0-2	90-100	90-100	90-95	70-90	40-60	20-35
	35-80	Bedrock	---	---	0	0	---	---	---	---	---	---
221:												
Klossner--------	0-10	Muck	PT	A-8	0	0	---	100	---	---	---	---
	10-26	Muck	PT	A-8	0	0	---	100	---	---	---	---
	26-36	Mucky clay loam, mucky silty clay loam	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	80-95	20-45	6-20
	36-48	Silty clay loam	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	80-95	20-45	6-20
	48-65	Clay loam, loam	CL-ML, CL	A-4, A-6	0	0	90-100	80-100	80-95	45-65	20-45	6-20
	65-80	Clay loam, loam	CL-ML, CL	A-4, A-6	0	0	90-100	80-100	80-95	45-65	20-45	6-20
284:												
Flagler---------	0-8	Sandy loam, fine sandy loam	SC, SC-SM	A-2-4, A-4	0	0	95-100	90-95	60-70	25-40	15-25	5-10
	8-15	Sandy loam, fine sandy loam	SC, SC-SM	A-2-4, A-4	0	0	95-100	90-95	60-70	25-40	15-25	5-10
	15-22	Sandy loam	SC, SC-SM	A-2-4, A-4	0	0	95-100	90-95	50-70	25-40	15-25	5-10
	22-33	Sandy loam	SC, SC-SM	A-2-4, A-4	0	0	95-100	90-95	50-70	25-40	15-25	5-10
	33-65	Sand, loamy sand	SP-SM, SW, SP, SW-SM	A-1-b	0	0-2	85-95	85-95	20-40	3-12	0-14	NP

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
284B:												
Flagler---------	0-8	Sandy loam, fine sandy loam	SC, SC-SM	A-2-4, A-4	0	0	95-100	90-95	60-70	25-40	15-25	5-10
	8-15	Sandy loam, fine sandy loam	SC, SC-SM	A-2-4, A-4	0	0	95-100	90-95	60-70	25-40	15-25	5-10
	15-22	Sandy loam	SC, SC-SM	A-2-4, A-4	0	0	95-100	90-95	50-70	25-40	15-25	5-10
	22-33	Sandy loam	SC, SC-SM	A-2-4, A-4	0	0	95-100	90-95	50-70	25-40	15-25	5-10
	33-65	Sand, loamy sand	SP-SM, SW, SP, SW-SM	A-1-b	0	0-2	85-95	85-95	20-40	3-12	0-14	NP
290:												
Dells-----------	0-7	Silt loam	CL	A-4	0	0	100	100	95-100	90-95	25-30	7-10
	7-16	Silt loam	CL	A-4	0	0	100	100	95-100	90-95	25-30	7-10
	16-28	Silt loam, silty clay loam	CL	A-6, A-7	0	0	100	100	90-100	85-95	30-45	11-20
	28-33	Loam, sandy loam, sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	100	100	60-100	40-75	20-35	4-14
	33-60	Loamy sand, sand	SP-SM, SM, SP	A-3, A-2, A-1	0	0	90-100	90-100	45-100	0-15	0-14	NP
354.												
Aquolls, ponded												
377B:												
Dinsdale--------	0-7	Silt loam, silty clay loam	CL	A-6, A-7-6	0	0	100	100	100	95-100	35-50	12-23
	7-15	Silt loam, silty clay loam	CL	A-6, A-7-6	0	0	100	100	100	95-100	35-50	12-23
	15-21	Silty clay loam	CL	A-7-6	0	0	100	100	100	95-100	40-50	15-25
	21-36	Silty clay loam	CL	A-7-6	0	0	100	100	100	95-100	40-50	15-25
	36-50	Clay loam, loam	CL	A-6	0	0-5	90-95	90-95	75-85	55-65	25-35	10-20
	50-80	Clay loam, loam	CL	A-6	0	0-5	90-95	90-95	75-85	55-65	25-35	10-20

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
377C:												
Dinsdale--------	0-7	Silt loam, silty clay loam	CL	A-6, A-7-6	0	0	100	100	100	95-100	35-50	12-23
	7-15	Silt loam, silty clay loam	CL	A-6, A-7-6	0	0	100	100	100	95-100	35-50	12-23
	15-21	Silty clay loam	CL	A-7-6	0	0	100	100	100	95-100	40-50	15-25
	21-36	Silty clay loam	CL	A-7-6	0	0	100	100	100	95-100	40-50	15-25
	36-50	Clay loam, loam	CL	A-6	0	0-5	90-95	90-95	75-85	55-65	25-35	10-20
	50-80	Clay loam, loam	CL	A-6	0	0-5	90-95	90-95	75-85	55-65	25-35	10-20
377C2:												
Dinsdale, moderately eroded---------	0-8	Silt loam, silty clay loam	CL	A-6, A-7-6	0	0	100	100	100	95-100	35-50	12-23
	8-25	Silty clay loam	CL	A-7-6	0	0	100	100	100	95-100	40-50	15-25
	25-40	Clay loam, loam	CL	A-6	0	0-5	90-95	90-95	75-85	55-65	25-35	10-20
	40-80	Clay loam, loam	CL	A-6	0	0-5	90-95	90-95	75-85	55-65	25-35	10-20
382:												
Maxfield--------	0-7	Silty clay loam	CL, CH	A-7-6	0	0	100	100	100	95-100	45-55	20-30
	7-17	Silty clay loam	CL, CH	A-7-6	0	0	100	100	100	95-100	45-55	20-30
	17-23	Silty clay loam	CH, CL	A-7-6	0	0	100	100	100	95-100	45-55	25-35
	23-32	Silt loam	CH, CL	A-7-6	0	0	100	100	100	95-100	45-55	25-35
	32-45	Loam	CL	A-6	0	0-5	90-95	90-95	75-85	55-65	25-35	10-20
	45-66	Loam	CL	A-6	0	0-5	90-95	90-95	75-85	55-65	25-35	10-20

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
391B:												
Clyde-----------	0-8	Loam, silty clay loam, clay loam	OL, MH, ML, OH	A-7	0	0-5	95-100	95-100	80-90	55-75	45-60	15-25
	8-17	Silty clay loam, clay loam	OL, MH, ML, OH	A-7	0	0-5	95-100	95-100	80-90	55-75	45-60	15-25
	17-23	Silty clay loam, clay loam	OL, MH, ML, OH	A-7	0	0-5	95-100	95-100	80-90	55-75	45-60	15-25
	23-41	Silty clay loam, clay loam	CL, ML	A-6, A-7	0	0-5	95-100	90-95	75-90	50-75	30-50	10-20
	41-44	Sandy loam, loam	SM, SC-SM	A-2-4	0	2-5	85-95	85-95	50-80	15-35	15-20	NP-5
	44-54	Loam, clay loam	CL, SC	A-6	0-5	2-5	90-95	85-95	75-90	45-65	25-35	10-20
	54-66	Loam, clay loam	CL, SC	A-6	0-5	2-5	90-95	85-95	75-90	45-65	25-35	10-20
Floyd-----------	0-8	Clay loam, loam	OL, ML, CL	A-4, A-6	0	0	100	100	80-90	55-75	30-40	5-15
	8-24	Clay loam, loam	OL, ML, CL	A-4, A-6	0	0	100	100	80-90	55-75	30-40	5-15
	24-33	Loam, sandy clay loam	CL	A-6	0	0-5	90-95	85-95	50-70	50-65	25-35	11-20
	33-41	Sandy loam, sandy clay loam, loam	SM, SC-SM	A-2-4	0	0-5	90-95	85-95	50-70	15-35	10-20	NP-5
	41-50	Clay loam, loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	25-35	11-20
	50-60	Clay loam, loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	25-35	11-20
395B:												
Marquis---------	0-8	Loam	CL	A-6	0	0-5	95-100	95-100	85-95	65-75	30-40	10-20
	8-19	Loam	CL	A-6	0	0-5	95-100	95-100	85-95	65-75	30-40	10-20
	19-24	Loam	CL	A-6	0	0-5	95-100	95-100	85-95	65-75	30-40	10-20
	24-54	Loam	CL	A-6	0	0-5	90-95	90-95	80-90	50-65	25-35	10-20
	54-80	Loam	CL	A-6	0	0-5	90-95	90-95	80-90	50-65	25-35	10-20
398:												
Tripoli---------	0-9	Silty clay loam, clay loam	CL	A-6, A-7	0	0	95-100	95-100	85-95	55-75	35-45	15-25
	9-18	Silty clay loam, clay loam	CL	A-6, A-7	0	0	95-100	95-100	85-95	55-75	35-45	15-25
	18-24	Clay loam	CL	A-6	0	0-5	90-95	90-95	75-85	55-65	30-40	11-20
	24-38	Loam	CL	A-6	0	0-5	90-95	90-95	75-85	55-65	30-40	11-20
	38-66	Clay loam, loam	CL, SC	A-6	0	0-5	90-95	90-95	75-85	45-65	30-40	11-20

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
399:												
Readlyn---------	0-7	Clay loam, loam	CL	A-6	0	0	95-100	95-100	85-95	55-75	30-40	15-25
	7-17	Clay loam, loam	CL	A-6	0	0	95-100	95-100	85-95	55-75	30-40	15-25
	17-43	Loam	CL, SC	A-6	0	0-5	90-95	90-95	75-85	45-65	30-40	10-20
	43-52	Loam	CL, SC	A-6	0	0-5	90-95	90-95	75-85	45-65	25-35	10-20
	52-60	Loam	CL, SC	A-6	0	0-5	90-95	90-95	75-85	45-65	25-35	10-20
408B:												
Olin------------	0-7	Sandy loam, fine sandy loam	SC-SM, SC	A-2, A-4	0	0	100	95-100	85-95	30-50	20-30	5-10
	7-23	Fine sandy loam, sandy loam	SC-SM, SC	A-2, A-4	0	0	100	95-100	85-95	30-50	20-30	5-10
	23-31	Sandy loam	SC-SM, SC	A-2, A-4	0	0	100	95-100	85-95	30-50	20-30	5-10
	31-52	Sandy clay loam, clay loam, loam	CL	A-6	0	0-5	90-95	90-95	80-90	50-65	25-35	10-20
	52-80	Clay loam, loam	CL	A-6	0	0-5	90-95	90-95	80-90	50-65	25-35	10-20
408C:												
Olin------------	0-7	Sandy loam, fine sandy loam	SC-SM, SC	A-2, A-4	0	0	100	95-100	85-95	30-50	20-30	5-10
	7-23	Fine sandy loam, sandy loam	SC-SM, SC	A-2, A-4	0	0	100	95-100	85-95	30-50	20-30	5-10
	23-31	Sandy loam	SC-SM, SC	A-2, A-4	0	0	100	95-100	85-95	30-50	20-30	5-10
	31-52	Sandy clay loam, clay loam, loam	CL	A-6	0	0-5	90-95	90-95	80-90	50-65	25-35	10-20
	52-80	Clay loam, loam	CL	A-6	0	0-5	90-95	90-95	80-90	50-65	25-35	10-20
412C:												
Emeline---------	0-9	Silt loam, clay loam, loam	CL	A-6	0	0-10	85-100	85-100	85-100	70-100	25-40	11-23
	9-80	Bedrock	---	---	0	0	---	---	---	---	---	---
426B:												
Aredale---------	0-7	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	95-100	85-95	55-75	25-35	5-15
	7-19	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	95-100	85-95	55-75	25-35	5-15
	19-33	Clay loam, loam	CL	A-6	0	0-5	95-100	95-100	80-90	50-70	30-40	10-20
	33-55	Sandy loam	SC, SM, SC-SM	A-2-4, A-4	0	0-5	95-100	95-100	70-90	20-50	15-25	NP-10
	55-70	Loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	25-35	11-20

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
426C:												
Aredale---------	0-7	Loam	CL, CL-ML	A-6, A-4	0	0	95-100	95-100	85-95	55-75	25-35	5-15
	7-19	Loam	CL, CL-ML	A-6, A-4	0	0	95-100	95-100	85-95	55-75	25-35	5-15
	19-33	Clay loam, loam	CL	A-6	0	0-5	95-100	95-100	80-90	50-70	30-40	10-20
	33-55	Sandy loam	SC, SM, SC-SM	A-2-4, A-4	0	0-5	95-100	95-100	70-90	20-50	15-25	NP-10
	55-70	Loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	25-35	11-20
426C2:												
Aredale, moderately eroded---------	0-8	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	95-100	85-95	55-75	25-35	5-15
	8-32	Clay loam, loam	CL	A-6	0	0-5	95-100	95-100	80-90	50-70	30-40	10-20
	32-50	Sandy loam	SC, SM, SC-SM	A-2-4, A-4	0	0-5	95-100	95-100	70-90	20-50	15-25	NP-10
	50-70	Loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	25-35	11-20
468B:												
Dunkerton-------	0-9	Loamy fine sand, loamy sand, fine sandy loam, sandy loam	SC-SM, SC	A-2, A-4	0	0	100	95-100	85-95	30-50	20-30	5-10
	9-15	Fine sandy loam, loamy sand, loamy fine sand, sandy loam	SC, SC-SM	A-2, A-4	0	0	100	95-100	85-95	30-50	20-30	5-10
	15-25	Sandy loam, sandy clay loam	SC-SM, SC	A-2, A-4	0	0	100	95-100	85-95	30-50	20-30	5-10
	25-49	Loam, clay loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	25-35	10-20
	49-80	Loam, clay loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	25-35	10-20

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
468C:												
Dunkerton-------	0-9	Loamy fine sand, loamy sand, fine sandy loam, sandy loam	SC-SM, SC	A-2, A-4	0	0	100	95-100	85-95	30-50	20-30	5-10
	9-15	Loamy fine sand, loamy sand, fine sandy loam, sandy loam	SC-SM, SC	A-2, A-4	0	0	100	95-100	85-95	30-50	20-30	5-10
	15-25	Sandy loam, sandy clay loam	SC-SM, SC	A-2, A-4	0	0	100	95-100	85-95	30-50	20-30	5-10
	25-49	Loam, clay loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	25-35	10-20
	49-80	Loam, clay loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	25-35	10-20
471:												
Oran------------	0-8	Silt loam, loam	CL, CL-ML	A-4, A-6	0	0	95-100	95-100	85-95	55-75	25-35	5-15
	8-14	Silt loam, loam	CL, CL-ML	A-4, A-6	0	0	95-100	95-100	85-95	55-75	25-35	5-15
	14-19	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	95-100	85-95	55-75	25-35	5-15
	19-42	Clay loam, sandy clay loam, loam	CL	A-6	0	0-5	90-95	85-90	75-85	55-65	30-40	10-20
	42-80	Loam	CL	A-6	0	0-5	90-95	85-90	75-85	55-65	30-40	10-20
485:												
Spillville, occasionally flooded--------	0-8	Loam	CL	A-6	0	0	100	95-100	85-95	60-80	25-40	10-20
	8-54	Loam	CL	A-6	0	0	100	95-100	85-95	60-80	25-40	10-20
	54-60	Sandy loam, sandy clay loam, loam	CL, CL-ML, SC-SM, SC	A-6, A-4	0	0	100	95-100	80-90	35-75	20-40	5-15
585:												
Spillville, occasionally flooded--------	0-8	Loam	CL	A-6	0	0	100	95-100	85-95	60-80	25-40	10-20
	8-54	Loam	CL	A-6	0	0	100	95-100	85-95	60-80	25-40	10-20
	54-60	Sandy loam, sandy clay loam, loam	CL, CL-ML, SC-SM, SC	A-4, A-6	0	0	100	95-100	80-90	35-75	20-40	5-15

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >10 inches	Fragments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
585: Coland, occasionally flooded--------	0-8	Clay loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	95-100	65-80	35-50	15-25
	8-32	Clay loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	95-100	65-80	35-50	15-25
	32-40	Loam, clay loam	CL	A-7-6, A-6	0	0	100	100	95-100	65-80	35-50	15-25
	40-44	Clay loam, loam, sandy loam	CL, SC, CL-ML, SC-SM	A-4, A-6	0	0	100	90-100	60-70	40-60	20-40	5-15
	44-52	Sandy loam, clay loam, loam	CL, SC, CL-ML, SC-SM	A-4, A-6	0	0	100	90-100	60-70	40-60	20-40	5-15
	52-60	Loam, clay loam, sandy loam	CL, SC, CL-ML, SC-SM	A-4, A-6	0	0	100	90-100	60-70	40-60	20-40	5-15
626: Hayfield, 24 to 40 inches to sand and gravel	0-8	Silt loam, loam	CL-ML, CL	A-6, A-4	0	0	100	100	90-98	70-90	25-40	6-15
	8-13	Silt loam, loam	CL-ML, CL	A-6, A-4	0	0	100	100	90-98	70-90	25-40	6-15
	13-29	Sandy clay loam, clay loam, loam	CL-ML, CL	A-4, A-6	0	0	95-100	90-100	70-90	40-75	25-40	6-15
	29-80	Loamy sand, sand, loamy coarse sand, coarse sand	SP, SP-SM	A-1-b	0	0-3	85-100	80-95	25-50	0-15	0-14	NP
761: Franklin--------	0-6	Silt loam	CL-ML, CL	A-4, A-6	0	0	100	100	100	95-100	25-35	5-15
	6-13	Silt loam	CL-ML, CL	A-4, A-6	0	0	100	100	100	95-100	25-35	5-15
	13-18	Silty clay loam	CL	A-7-6	0	0	100	100	100	95-100	40-50	20-30
	18-28	Silty clay loam	CL	A-7-6	0	0	100	100	100	95-100	40-50	20-30
	28-37	Clay loam, loam	CL	A-6	0	0-5	95-100	90-95	75-85	55-65	25-35	10-20
	37-46	Loam, clay loam	CL	A-6	0	0-5	95-100	90-95	75-85	55-65	25-35	10-20
	46-64	Loam, clay loam	CL	A-6	0	0-5	95-100	90-95	75-85	55-65	25-35	10-20
	64-74	Clay loam, loam	CL	A-6	0	0-5	95-100	90-95	75-85	55-65	25-35	10-20

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
771B:												
Waubeek---------	0-7	Silt loam	CL-ML, CL	A-6, A-4	0	0	100	100	100	95-100	25-35	5-15
	7-13	Silt loam	CL-ML, CL	A-4, A-6	0	0	100	100	100	95-100	25-35	5-15
	13-29	Silt loam, silty clay loam	CL	A-7-6	0	0	100	100	100	95-100	40-50	15-25
	29-34	Clay loam, loam	CL	A-6	0	0-5	90-95	85-95	75-85	50-65	25-35	10-20
	34-45	Loam, clay loam	CL	A-6	0	0-5	90-95	85-95	75-85	50-65	25-35	10-20
	45-67	Clay loam, loam	CL	A-6	0	0-5	90-95	85-95	75-85	50-65	25-35	10-20
775B:												
Billett---------	0-8	Sandy loam, fine sandy loam	SM, SC-SM, SC	A-2-4, A-4	0	0	100	95-100	60-100	25-50	15-25	2-10
	8-13	Fine sandy loam, sandy loam	SC-SM, SC	A-2-4, A-4, A-6	0	0	100	95-100	60-100	25-50	20-30	5-15
	13-28	Fine sandy loam, sandy loam	SC-SM, SC	A-2-4, A-4, A-6	0	0	100	95-100	60-100	25-50	20-30	5-15
	28-41	Loamy sand, fine sandy loam	SM, SC-SM, SC	A-2-4, A-4, A-6	0	0	95-100	85-100	75-90	20-45	15-30	3-15
	41-47	Sandy loam, fine sandy loam	SM, SC-SM, SC	A-2-4, A-4, A-6	0	0	95-100	85-100	75-90	20-45	15-30	3-15
	47-52	Loamy sand, fine sand, loamy fine sand, sand	SM, SC-SM, SW-SM	A-2, A-1-b, A-3	0	0-5	85-100	80-100	20-75	5-30	15-25	NP-5
	52-60	Gravelly sand, sand, loamy sand, gravelly loamy sand	SM, SP-SM	A-2, A-1-b, A-3	0	0-5	85-100	75-100	20-75	5-30	15-25	NP-5

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
776C:												
Lilah-----------	0-6	Sandy loam	SC-SM, SC	A-2-4, A-4	0	0-5	90-95	85-95	60-70	25-40	15-25	5-10
	6-15	Sandy loam, gravelly sandy loam	SM, SC-SM, SC	A-2-4, A-1-b	0	0-5	80-95	60-90	40-60	15-30	15-25	3-10
	15-28	Gravelly loamy sand, sand	SW, SW-SM	A-1-b	0	0-10	70-90	50-70	30-50	3-12	0-14	NP
	28-39	Sand, gravelly loamy sand	SW, SW-SM, SP, SP-SM	A-1-b	0	0-5	85-95	85-95	30-50	3-12	0-14	NP
	39-60	Sand, loamy sand	SP, SP-SM	A-1-b	0	0-5	80-100	80-100	30-50	3-12	0-14	NP
777:												
Wapsie----------	0-8	Sandy clay loam, sandy loam, loam	CL, ML, CL-ML	A-4	0	0	100	90-100	70-90	45-75	25-35	5-10
	8-13	Sandy clay loam, sandy loam, loam	CL, ML, CL-ML	A-4	0	0	100	90-100	70-90	45-75	25-35	5-10
	13-17	Loam	CL, CL-ML, SC-SM	A-4, A-6	0	0	85-95	80-95	70-85	55-75	20-35	5-15
	17-27	Sandy clay loam	CL, SC, CL-ML, SC-SM	A-4, A-6	0	0	85-95	80-95	70-85	40-60	20-35	5-15
	27-29	Loam, sandy loam	CL, SC, CL-ML, SC-SM	A-4, A-6	0	0	85-95	80-95	70-85	40-60	20-35	5-15
	29-38	Gravelly loamy sand, sand, gravelly sand	SW, SM, SP, SP-SM	A-1-b	0	0	85-95	80-95	20-40	3-25	0-14	NP
	38-60	Sand, gravelly loamy sand, gravelly sand	SW, SM, SP, SP-SM	A-1-b	0	0	60-90	60-85	20-40	3-25	0-14	NP
781B:												
Lourdes---------	0-8	Loam	CL, ML	A-6, A-7	0	0	95-100	95-100	90-95	65-80	35-45	10-20
	8-11	Loam	CL	A-6	0	0	95-100	95-100	80-90	50-70	30-40	10-20
	11-15	Clay loam	CL	A-6	0	0	95-100	95-100	80-90	50-70	30-40	10-20
	15-44	Clay loam	CL	A-6	0	0-5	90-95	85-95	80-90	55-75	35-40	15-20
	44-51	Clay loam	CL	A-6	0	0-5	90-95	85-95	80-90	55-70	35-40	15-20
	51-76	Clay loam	CL	A-6	0	0-5	90-95	85-95	80-90	55-70	35-40	15-20

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
781C2:												
Lourdes, moderately eroded---------	0-8	Loam	CL, ML	A-6, A-7	0	0	95-100	95-100	90-95	65-80	35-45	10-20
	8-14	Clay loam	CL	A-6	0	0-5	90-95	85-95	80-90	55-75	35-40	15-20
	14-42	Clay loam	CL	A-6	0	0-5	90-95	85-95	80-90	55-70	35-40	15-20
	42-47	Clay loam	CL	A-6	0	0-5	90-95	85-95	80-90	55-70	35-40	15-20
	47-76	Clay loam	CL	A-6	0	0-5	90-95	85-95	80-90	55-70	35-40	15-20
782B:												
Donnan----------	0-8	Silt loam, loam	CL, ML	A-4, A-6	0	0	100	100	85-95	65-80	30-40	5-15
	8-13	Silt loam, loam	ML, CL	A-4, A-6	0	0	100	100	85-95	65-80	30-40	5-15
	13-18	Loam, silt loam	ML, CL	A-4, A-6	0	0	100	100	85-95	65-80	30-40	5-15
	18-24	Silty clay loam, loam, clay loam	CL	A-6	0	0-5	95-100	90-95	80-90	60-85	30-40	10-20
	24-48	Silty clay	CH	A-7-6	0	0-3	95-100	90-95	85-95	85-95	55-70	30-40
	48-60	Clay loam, loam	CL	A-6, A-7	0	0-5	95-100	85-95	80-90	55-75	35-45	15-25
798:												
Protivin--------	0-8	Clay loam, loam	CL	A-7, A-6	0	0	95-100	95-100	85-95	60-75	30-45	10-25
	8-15	Clay loam, loam	CL	A-7, A-6	0	0	95-100	95-100	85-95	60-75	30-45	10-25
	15-19	Loam, clay loam	CL	A-6	0	0-5	90-95	85-95	75-85	55-65	35-40	15-20
	19-23	Loam, clay loam	CL	A-6	0	0-5	90-95	85-95	75-85	55-65	35-40	15-20
	23-45	Clay loam	CL	A-6	0	0-5	90-95	85-95	75-85	55-65	30-40	15-25
	45-60	Clay loam	CL	A-6	0	2-5	90-95	85-95	75-85	55-65	30-40	15-25
809B:												
Bertram---------	0-8	Sandy loam	SC-SM, SC, SM	A-2, A-4	0	0	100	95-100	85-95	30-50	25-35	5-10
	8-17	Sandy loam	SC-SM, SC, SM	A-2, A-4	0	0	100	95-100	85-95	30-50	25-35	5-10
	17-30	Sandy loam	SC-SM, SC	A-2-4, A-4	0	0	100	95-100	80-90	25-40	15-25	5-10
	30-34	Clay loam, sandy clay loam	SC, CL	A-6, A-7	0	0	85-95	85-95	70-80	45-65	35-45	20-30
	34-36	Loamy sand	SC	A-2-6, A-2-7	0	0	85-95	85-95	30-70	15-30	35-45	20-30
	36-80	Bedrock	---	---	0	0	---	---	---	---	---	---

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
877B:												
Dinsmore--------	0-8	Silt loam, silty clay loam	ML, CL	A-6, A-7-6	0	0	100	100	100	95-100	30-50	10-20
	8-16	Silt loam, silty clay loam	ML, CL	A-6, A-7-6	0	0	100	100	100	95-100	30-50	10-20
	16-48	Silt loam, silty clay loam	CL	A-6, A-7-6	0	0	100	100	100	95-100	40-50	15-25
	48-80	Clay loam, loam	CL	A-6	0	0-5	90-95	85-95	75-85	55-65	25-35	10-20
884:												
Klingmore-------	0-8	Silt loam, silty clay loam	CL	A-7-6	0	0	100	100	100	95-100	40-50	15-25
	8-19	Silt loam, silty clay loam	CL	A-7-6	0	0	100	100	100	95-100	40-50	15-25
	19-56	Silt loam, silty clay loam	CL	A-7-6	0	0	100	100	100	95-100	40-50	20-30
	56-80	Clay loam, loam	CL	A-6	0	0-5	90-95	85-95	75-85	55-65	25-35	10-20
911B:												
Colo------------	0-8	Silt loam, silty clay loam	CL, CH	A-7	0	0	100	100	90-100	90-100	40-60	15-30
	8-34	Silt loam, silty clay loam	CL, CH	A-7	0	0	100	100	90-100	90-100	40-60	15-30
	34-40	Silty clay loam	CL, CH	A-7	0	0	100	100	90-100	90-100	40-60	15-30
	40-46	Silty clay loam	CL, CH	A-7	0	0	100	100	90-100	90-100	40-55	20-30
	46-52	Silty clay loam	CL, CH	A-7	0	0	100	100	90-100	90-100	40-55	20-30
	52-60	Clay loam, silty clay loam, silt loam	CL, CH	A-7	0	0	100	100	95-100	80-100	40-55	15-30

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
911B:												
Ely-------------	0-8	Silt loam, silty clay loam	CL, OL, OH, MH	A-7-6, A-6	0	0	100	100	95-100	95-100	30-55	10-25
	8-24	Silt loam, silty clay loam	CL, OL, OH, MH	A-7-6, A-6	0	0	100	100	95-100	95-100	30-55	10-25
	24-32	Silty clay loam	CL, ML	A-6, A-7-6	0	0	100	100	95-100	95-100	30-55	10-25
	32-47	Silty clay loam	CL, ML	A-7-6, A-6	0	0	100	100	95-100	95-100	35-50	10-25
	47-58	Silty clay loam	CL	A-6	0	0	100	100	90-100	85-100	25-40	10-20
	58-80	Loam, clay loam, silt loam, silty clay loam	CL	A-6	0	0	95-100	95-100	80-95	65-95	25-40	10-20
933:												
Sawmill, occasionally flooded--------	0-10	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-100	30-50	15-30
	10-25	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-100	30-50	15-30
	25-32	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-100	30-50	15-30
	32-40	Silty clay loam	CL	A-6, A-7, A-4	0	0	100	100	85-100	80-95	25-50	8-25
	40-58	Silty clay loam, clay loam, loam	CL	A-6, A-7, A-4	0	0	100	100	85-100	70-95	25-50	8-25
	58-65	Clay loam, loam, silty clay loam	CL	A-4, A-6, A-7	0	0	100	100	75-100	65-95	20-50	8-30
982:												
Maxmore---------	0-8	Silt loam, silty clay loam	CL, CH	A-7-6	0	0	100	100	100	95-100	45-55	20-30
	8-20	Silt loam, silty clay loam	CL, CH	A-7-6	0	0	100	100	100	95-100	45-55	20-30
	20-50	Silt loam, silty clay loam	CH, CL	A-7-6	0	0	100	100	100	95-100	45-55	25-35
	50-80	Clay loam, loam	CL	A-6	0	0-5	90-95	85-95	75-85	55-65	25-35	10-20

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
1152: Marshan, 24 to 40 inches to sand and gravel	0-10	Loam, clay loam, silty clay loam	CL	A-7-6, A-6	0	0	95-100	95-100	75-100	65-95	35-50	15-25
	10-14	Loam, clay loam, silty clay loam	CL	A-7-6, A-6	0	0	95-100	95-100	75-100	65-95	35-50	15-25
	14-18	Silty clay loam, loam, clay loam	CL	A-7-6, A-6	0	0	95-100	95-100	75-100	65-95	30-50	15-30
	18-23	Silty clay loam, loam, clay loam	CL	A-7-6, A-6	0	0	95-100	95-100	75-100	65-95	30-50	15-30
	23-30	Sandy loam, clay loam, loam	CL, CL-ML, SC, SC-SM	A-6, A-4	0	0	95-100	75-100	70-90	35-75	25-40	5-15
	30-40	Sand, gravelly sand	SP, SW, SP-SM	A-1	0	0-3	90-95	80-95	20-45	2-5	0-0	NP
	40-60	Sand, gravelly sand	SP, SW, SP-SM	A-1	0	0-3	65-95	45-95	20-45	2-5	0-0	NP
1226: Lawler, 24 to 40 inches to sand and gravel-----	0-8	Silt loam, loam	CL, ML	A-6, A-7	0	0	100	90-100	70-90	55-90	35-45	10-20
	8-15	Silt loam, loam	CL, ML	A-6, A-7	0	0	100	90-100	70-90	55-90	35-45	10-20
	15-21	Loam, clay loam	CL, ML	A-6, A-7	0	0	100	90-100	70-90	55-75	35-45	10-20
	21-32	Sandy clay loam, loam	CL, SC	A-6	0	0-5	90-95	85-95	70-85	45-65	25-40	10-20
	32-37	Sandy clay loam	CL, SC	A-6	0	0-5	90-95	85-95	70-85	45-65	25-40	10-20
	37-60	Coarse sand, loamy coarse sand, very gravelly sand, very gravelly loamy sand	SW, GP, SP, SW-SM	A-1	0	0-10	50-90	50-85	15-35	3-10	0-14	NP

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
1285G:												
Burkhardt-------	0-10	Gravelly sandy loam, loam, sandy loam	SM, SC-SM	A-2-4, A-4	0	0	85-95	80-95	55-70	25-40	15-26	2-7
	10-17	Gravelly sandy loam, loam, sandy loam	SM, ML, SC, CL	A-2, A-4	0	0	85-100	80-100	50-95	25-75	15-30	2-10
	17-19	Gravelly sand, gravelly loamy sand, sand, loamy sand	SP, SP-SM	A-1	0	0	80-95	80-95	20-35	1-5	0-14	NP
	19-60	Stratified sand to gravelly coarse sand	SP, SP-SM, GP, GP-GM	A-1	0	0	50-85	45-85	10-20	1-5	0-14	NP
Bassett---------	0-5	Silt loam, loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	95-100	85-95	65-85	20-30	5-15
	5-10	Silt loam, loam	CL	A-6, A-4	0	0-5	95-100	95-100	85-95	65-85	20-30	5-15
	10-14	Loam	CL	A-6, A-4	0	0-5	95-100	95-100	85-95	65-85	20-30	5-15
	14-43	Sandy clay loam, clay loam, loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	30-40	11-20
	43-59	Loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	30-40	11-20
	59-73	Loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	30-40	11-20
Chelsea---------	0-4	Fine sand, loamy fine sand	SM, SP-SM	A-2-4	0	0	100	100	65-80	10-35	0-14	NP
	4-30	Loamy fine sand, fine sand	SP, SM, SP-SM	A-3, A-2-4	0	0	100	100	65-85	3-15	0-14	NP
	30-70	Loamy fine sand, fine sandy loam, loamy sand, fine sand, sandy loam	SP, SM, SP-SM	A-3, A-2-4	0	0	100	100	65-85	3-15	0-14	NP
1585:												
Spillville, frequently flooded--------	0-54	Loam	CL	A-6	0	0	100	95-100	85-95	60-80	25-40	10-20
	54-60	Sandy loam, sandy clay loam, loam	CL, CL-ML, SC-SM, SC	A-6, A-4	0	0	100	95-100	80-90	35-75	20-40	5-15

Table 18.--Engineering Index Properties--Continued

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	
1585:												
Coland, frequently flooded--------	0-32	Clay loam, silty clay loam	CL	A-6, A-7-6	0	0	100	100	95-100	65-80	35-50	15-25
	32-40	Loam, clay loam	CL	A-7-6, A-6	0	0	100	100	95-100	65-80	35-50	15-25
	40-44	Loam, clay loam, sandy loam	CL, SC, CL-ML, SC-SM	A-4, A-6	0	0	100	90-100	60-70	40-60	20-40	5-15
	44-52	Sandy loam, clay loam, loam	SC, CL, CL-ML, SC-SM	A-6, A-4	0	0	100	90-100	60-70	40-60	20-40	5-15
	52-60	Loam, clay loam, sandy loam	CL, SC, CL-ML, SC-SM	A-4, A-6	0	0	100	90-100	60-70	40-60	20-40	5-15
Aquolls, ponded.												
1586:												
Sigglekov, frequently flooded--------	0-9	Loam, sandy loam, silt loam	ML, SC-SM, SM	A-2, A-4	0	0	100	100	75-80	30-80	15-30	NP-10
	9-15	Sand, sandy loam, loamy sand	SM, SW, SW-SM, SP-SM	A-1-b	0	0	90-100	90-95	30-50	3-20	0-14	NP
	15-35	Sand, sandy loam, loamy sand	SM, SW, SW-SM, SP-SM	A-1-b	0	0	90-100	90-95	30-50	3-20	0-14	NP
	35-80	Coarse sand, sandy loam, loamy sand	SM, SW, SW-SM, SP-SM	A-1-b	0	0	90-100	90-95	30-50	3-20	0-14	NP
Fluvaquents, frequently flooded.												
Aquents, ponded.												
4000:												
Urban land.												

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
4007:												
Wiota-----------	0-8	Silt loam, silty clay loam	CL	A-6	0	0	100	100	100	90-95	25-35	10-20
	8-22	Silt loam, silty clay loam	CL	A-6	0	0	100	100	100	90-95	25-35	10-20
	22-28	Silty clay loam	CL	A-7	0	0	100	100	95-100	85-95	40-50	15-25
	28-48	Silty clay loam	CL	A-7	0	0	100	100	95-100	85-95	40-50	15-25
	48-54	Silt loam, silty clay loam	CL	A-7, A-6	0	0	100	100	95-100	85-95	30-50	15-30
	54-80	Sand, loamy sand	SM, SC-SM	A-2-4, A-3	0	0	100	95-100	60-80	5-20	10-20	NP-5
Urban land.												
4041:												
Sparta----------	0-11	Sand, fine sand, loamy sand, loamy fine sand	SM	A-2-4, A-3	0	0	95-100	90-100	50-95	5-35	0-14	NP
	11-15	Sand, fine sand, loamy sand, loamy fine sand	SM	A-2-4, A-3	0	0	95-100	90-100	50-95	5-35	0-14	NP
	15-34	Sand, loamy sand, loamy fine sand, fine sand	SP-SM, SM	A-2-4, A-3	0	0	95-100	90-100	50-95	5-35	0-14	NP
	34-60	Sand, fine sand	SP-SM, SM, SP	A-2-4, A-3	0	0	95-100	90-100	50-95	2-20	0-14	NP
Urban land.												

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
4041B:												
Sparta----------	0-11	Sand, fine sand, loamy sand, loamy fine sand	SM	A-2-4, A-3	0	0	95-100	90-100	50-95	5-35	0-14	NP
	11-15	Sand, fine sand, loamy sand, loamy fine sand	SM	A-2-4, A-3	0	0	95-100	90-100	50-95	5-35	0-14	NP
	15-34	Sand, loamy sand, loamy fine sand, fine sand	SP-SM, SM	A-2-4, A-3	0	0	95-100	90-100	50-95	5-35	0-14	NP
	34-60	Sand, fine sand	SP-SM, SM, SP	A-2-4, A-3	0	0	95-100	90-100	50-95	2-20	0-14	NP
Urban land.												
4041C:												
Sparta----------	0-9	Sand, fine sand, loamy sand, loamy fine sand	SM	A-2-4, A-3	0	0	95-100	90-100	50-95	5-35	0-14	NP
	9-14	Sand, fine sand, loamy sand, loamy fine sand	SM	A-2-4, A-3	0	0	95-100	90-100	50-95	5-35	0-14	NP
	14-32	Sand, loamy sand, loamy fine sand, fine sand	SP-SM, SM	A-2-4, A-3	0	0	95-100	90-100	50-95	5-35	0-14	NP
	32-60	Sand, fine sand	SP-SM, SM, SP	A-2-4, A-3	0	0	95-100	90-100	50-95	2-20	0-14	NP
Urban land.												

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
4041D:												
Sparta----------	0-9	Sand, fine sand, loamy sand, loamy fine sand	SM	A-2-4, A-3	0	0	95-100	90-100	50-95	5-35	0-14	NP
	9-14	Sand, fine sand, loamy sand, loamy fine sand	SM	A-2-4, A-3	0	0	95-100	90-100	50-95	5-35	0-14	NP
	14-30	Sand, loamy sand, loamy fine sand, fine sand	SP-SM, SM	A-2-4, A-3	0	0	95-100	90-100	50-95	5-35	0-14	NP
	30-60	Sand, fine sand	SP-SM, SM, SP	A-2-4, A-3	0	0	95-100	90-100	50-95	2-20	0-14	NP
Urban land.												
4063B:												
Chelsea---------	0-8	Fine sand, loamy fine sand	SM, SP-SM	A-2-4	0	0	100	100	65-80	10-35	0-14	NP
	8-36	Loamy fine sand, fine sand	SM, SP, SP-SM	A-3, A-2-4	0	0	100	100	65-85	3-15	0-14	NP
	36-70	Loamy fine sand, fine sandy loam, loamy sand, fine sand, sandy loam	SM, SP, SP-SM	A-3, A-2-4	0	0	100	100	65-85	3-15	0-14	NP
Urban land.												

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
4063C:												
Chelsea---------	0-8	Fine sand, loamy fine sand	SM, SP-SM	A-2-4	0	0	100	100	65-80	10-35	0-14	NP
	8-36	Loamy fine sand, fine sand	SM, SP, SP-SM	A-3, A-2-4	0	0	100	100	65-85	3-15	0-14	NP
	36-70	Loamy fine sand, fine sandy loam, loamy sand, fine sand, sandy loam	SM, SP, SP-SM	A-3, A-2-4	0	0	100	100	65-85	3-15	0-14	NP
Urban land.												
4063D:												
Chelsea---------	0-8	Fine sand, loamy fine sand	SM, SP-SM	A-2-4	0	0	100	100	65-80	10-35	0-14	NP
	8-32	Loamy fine sand, fine sand	SM, SP, SP-SM	A-3, A-2-4	0	0	100	100	65-85	3-15	0-14	NP
	32-70	Fine sand, sandy loam, loamy fine sand, fine sandy loam, loamy sand	SM, SP, SP-SM	A-3, A-2-4	0	0	100	100	65-85	3-15	0-14	NP
Urban land.												
4083B:												
Kenyon----------	0-8	Loam, silt loam	CL	A-6	0	0-5	95-100	95-100	85-95	65-75	30-40	10-20
	8-14	Loam, silt loam	CL	A-6	0	0-5	95-100	95-100	85-95	65-75	30-40	10-20
	14-19	Loam, sandy clay loam, silt loam	CL	A-6	0	0-5	95-100	95-100	85-95	65-75	30-40	10-20
	19-47	Loam, clay loam, sandy clay loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	30-40	10-20
	47-54	Loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	25-35	10-20
	54-76	Loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	25-35	10-20
Urban land.												

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
4083C:												
Kenyon----------	0-8	Loam, silt loam	CL	A-6	0	0-5	95-100	95-100	85-95	65-75	30-40	10-20
	8-14	Loam, silt loam	CL	A-6	0	0-5	95-100	95-100	85-95	65-75	30-40	10-20
	14-19	Loam, sandy clay loam, silt loam	CL	A-6	0	0-5	95-100	95-100	85-95	65-75	30-40	10-20
	19-47	Loam, clay loam, sandy clay loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	30-40	10-20
	47-54	Loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	25-35	10-20
	54-76	Loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	25-35	10-20
Urban land.												
4083D:												
Kenyon----------	0-8	Loam, silt loam	CL	A-6	0	0-5	95-100	95-100	85-95	65-75	30-40	10-20
	8-14	Loam, silt loam	CL	A-6	0	0-5	95-100	95-100	85-95	65-75	30-40	10-20
	14-19	Loam, sandy clay loam, silt loam	CL	A-6	0	0-5	95-100	95-100	85-95	65-75	30-40	10-20
	19-47	Loam, clay loam, sandy clay loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	30-40	10-20
	47-54	Loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	25-35	10-20
	54-76	Loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	25-35	10-20
Urban land.												
4084:												
Clyde-----------	0-8	Clay loam, silty clay loam, loam	OL, MH, ML, OH	A-7	0	0-5	95-100	95-100	80-90	55-75	45-60	15-25
	8-17	Silty clay loam, clay loam	OL, MH, ML, OH	A-7	0	0-5	95-100	95-100	80-90	55-75	45-60	15-25
	17-23	Clay loam, silty clay loam	OL, MH, ML, OH	A-7	0	0-5	95-100	95-100	80-90	55-75	45-60	15-25
	23-41	Clay loam, silty clay loam	CL, ML	A-6, A-7	0	0-5	95-100	90-95	75-90	50-75	30-50	10-20
	41-44	Sandy loam, loam	SM, SC-SM	A-2-4	0	2-5	85-95	85-95	50-80	15-35	15-20	NP-5
	44-54	Loam, clay loam	CL, SC	A-6	0-5	2-5	90-95	85-95	75-90	45-65	25-35	10-20
	54-66	Clay loam, loam	CL, SC	A-6	0-5	2-5	90-95	85-95	75-90	45-65	25-35	10-20

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
4084:												
Urban land.												
4088:												
Nevin-----------	0-8	Silt loam, silty clay loam	CL, OL	A-6, A-7	0	0	100	100	100	90-95	35-45	10-20
	8-24	Silty clay loam, silt loam	CL, OL	A-6, A-7	0	0	100	100	100	90-95	35-45	10-20
	24-30	Silt loam, silty clay loam	CL	A-7, A-6	0	0	100	100	95-100	90-95	35-45	10-20
	30-46	Silty clay loam	CL	A-7-6	0	0	100	100	95-100	90-95	40-50	20-30
	46-58	Silty clay loam	CL	A-7-6	0	0	100	100	95-100	90-95	40-50	20-30
	58-80	Loamy sand, sandy loam, sand	SM, SC-SM	A-2-4, A-3	0	0	100	95-100	60-80	5-20	10-18	NP-5
Urban land.												
4133:												
Colo, occasionally flooded--------	0-8	Silt loam, silty clay loam	CL, CH	A-7	0	0	100	100	90-100	90-100	40-60	15-30
	8-34	Silt loam, silty clay loam	CL, CH	A-7	0	0	100	100	90-100	90-100	40-60	15-30
	34-40	Silty clay loam	CL, CH	A-7	0	0	100	100	90-100	90-100	40-60	15-30
	40-46	Silty clay loam	CL, CH	A-7	0	0	100	100	90-100	90-100	40-55	20-30
	46-52	Silty clay loam	CL, CH	A-7	0	0	100	100	90-100	90-100	40-55	20-30
	52-60	Clay loam, silty clay loam, silt loam	CL, CH	A-7	0	0	100	100	95-100	80-100	40-55	15-30
Urban land.												

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
4135:												
Coland, occasionally flooded--------	0-8	Clay loam, silty clay loam	CL	A-7-6	0	0	100	100	95-100	65-80	35-50	15-25
	8-32	Clay loam, silty clay loam	CL	A-7-6	0	0	100	100	95-100	65-80	35-50	15-25
	32-40	Clay loam, loam	CL	A-7-6	0	0	100	100	95-100	65-80	35-50	15-25
	40-44	Sandy loam, loam, clay loam	CL, SC, CL-ML, SC-SM	A-4, A-6	0	0	100	90-100	60-70	40-60	20-40	5-15
	44-52	Sandy loam, clay loam, loam	CL, SC, CL-ML, SC-SM	A-4, A-6	0	0	100	90-100	60-70	40-60	20-40	5-15
	52-66	Loam, clay loam, sandy loam	CL, SC, CL-ML, SC-SM	A-4, A-6	0	0	100	90-100	60-70	40-60	20-40	5-15
Urban land.												
4152:												
Marshan, 24 to 40 inches to sand and gravel	0-10	Loam, clay loam, silty clay loam	CL	A-7-6, A-6	0	0	95-100	95-100	75-100	65-95	35-50	15-25
	10-14	Loam, clay loam, silty clay loam	CL	A-7-6, A-6	0	0	95-100	95-100	75-100	65-95	35-50	15-25
	14-18	Silty clay loam, loam, clay loam	CL	A-7-6, A-6	0	0	95-100	95-100	75-100	65-95	30-50	15-30
	18-23	Silty clay loam, loam, clay loam	CL	A-7-6, A-6	0	0	95-100	95-100	75-100	65-95	30-50	15-30
	23-30	Sandy loam, clay loam, loam	CL, CL-ML, SC, SC-SM	A-6, A-4	0	0	95-100	75-100	70-90	35-75	25-40	5-15
	30-40	Sand, gravelly sand	SP, SW, SP-SM	A-1	0	0-3	90-95	80-95	20-45	2-5	0-0	NP
	40-60	Sand, gravelly sand	SP, SW, SP-SM	A-1	0	0-3	65-95	45-95	20-45	2-5	0-0	NP

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
4152: Urban land.												
4159: Finchford-------	0-8	Loamy sand, sandy loam, sand	SM	A-2-4, A-3	0	0	90-95	85-95	50-60	5-15	0-14	NP
	8-18	Loamy sand, sandy loam, sand	SM	A-2-4, A-3	0	0	90-95	85-95	50-60	5-15	0-14	NP
	18-30	Sand, loamy sand, loamy coarse sand, coarse sand	SP-SM	A-1-b	0	0	90-95	85-95	25-40	5-10	0-14	NP
	30-55	Gravelly coarse sand, gravelly sand, sand, coarse sand	SW, SW-SM	A-1	0	0-5	50-75	50-75	20-35	3-5	0-14	NP
	55-70	Coarse sand, gravelly coarse sand, gravelly sand, sand	SW, SW-SM	A-1	0	0-5	50-75	50-75	20-35	3-5	0-14	NP
	70-80	Gravelly coarse sand, gravelly sand, sand, coarse sand	SW, SW-SM	A-1	0	0-5	50-75	50-75	20-35	3-5	0-14	NP
Urban land.												

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
4159C:												
Finchford-------	0-8	Loamy sand, sandy loam, sand	SM	A-2-4, A-3	0	0	90-95	85-95	50-60	5-15	0-14	NP
	8-15	Loamy sand, sandy loam, sand	SM	A-2-4, A-3	0	0	90-95	85-95	50-60	5-15	0-14	NP
	15-26	Sand, loamy sand, loamy coarse sand, coarse sand	SP-SM	A-1-b	0	0	90-95	85-95	25-40	5-10	0-14	NP
	26-50	Gravelly coarse sand, gravelly sand, sand, coarse sand	SW, SW-SM	A-1	0	0-5	50-75	50-75	20-35	3-5	0-14	NP
	50-65	Coarse sand, gravelly coarse sand, gravelly sand, sand	SW, SW-SM	A-1	0	0-5	50-75	50-75	20-35	3-5	0-14	NP
	65-80	Gravelly coarse sand, gravelly sand, sand, coarse sand	SW, SW-SM	A-1	0	0-5	50-75	50-75	20-35	3-5	0-14	NP
Urban land.												
4171B:												
Bassett---------	0-8	Silt loam, loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	95-100	85-95	65-85	20-30	5-15
	8-10	Silt loam, loam	CL	A-4, A-6	0	0-5	95-100	95-100	85-95	65-85	20-30	5-15
	10-14	Loam	CL	A-4, A-6	0	0-5	95-100	95-100	85-95	65-85	20-30	5-15
	14-43	Sandy clay loam, clay loam, loam	CL	A-6	0	2-5	90-95	85-95	80-90	50-65	30-40	11-20
	43-59	Loam	CL	A-6	0	2-5	90-95	85-95	80-90	50-65	30-40	11-20
	59-73	Loam	CL	A-6	0	2-5	90-95	85-95	80-90	50-65	30-40	11-20
Urban land.												

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
4171D:												
Bassett---------	0-8	Silt loam, loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	95-100	85-95	65-85	20-30	5-15
	8-10	Silt loam, loam	CL	A-4, A-6	0	0-5	95-100	95-100	85-95	65-85	20-30	5-15
	10-14	Loam	CL	A-4, A-6	0	0-5	95-100	95-100	85-95	65-85	20-30	5-15
	14-43	Sandy clay loam, clay loam, loam	CL	A-6	0	2-5	90-95	85-95	80-90	50-65	30-40	11-20
	43-59	Loam	CL	A-6	0	2-5	90-95	85-95	80-90	50-65	30-40	11-20
	59-73	Loam	CL	A-6	0	2-5	90-95	85-95	80-90	50-65	30-40	11-20
Urban land.												
4175:												
Dickinson-------	0-9	Loam, sandy loam, fine sandy loam	SM, SC, SC-SM	A-4, A-2	0	0	100	100	85-95	30-50	15-30	NP-10
	9-18	Loam, sandy loam, fine sandy loam	SM, SC, SC-SM	A-4	0	0	100	100	85-95	30-50	15-30	NP-10
	18-30	Sandy loam, fine sandy loam	SM, SC, SC-SM	A-4	0	0	100	100	85-95	35-50	15-30	NP-10
	30-36	Sand, fine sand, loamy fine sand, loamy sand	SM, SC-SM	A-2-4, A-3	0	0	100	100	80-95	5-20	10-20	NP-5
	36-60	Fine sand, loamy fine sand, loamy sand, sand	SM	A-3, A-2	0	0	100	100	70-90	5-15	0-14	NP
Urban land.												

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
4175B:												
Dickinson-------	0-9	Loam, sandy loam, fine sandy loam	SM, SC, SC-SM	A-4, A-2	0	0	100	100	85-95	30-50	15-30	NP-10
	9-18	Loam, sandy loam, fine sandy loam	SM, SC, SC-SM	A-4	0	0	100	100	85-95	30-50	15-30	NP-10
	18-30	Sandy loam, fine sandy loam	SM, SC, SC-SM	A-4	0	0	100	100	85-95	35-50	15-30	NP-10
	30-36	Loamy sand, sand, fine sand, loamy fine sand	SM, SC-SM	A-2-4, A-3	0	0	100	100	80-95	5-20	10-20	NP-5
	36-60	Fine sand, loamy fine sand, loamy sand, sand	SM	A-3, A-2	0	0	100	100	70-90	5-15	0-14	NP
Urban land.												
4177:												
Saude-----------	0-7	Loam	CL	A-6	0	0	100	90-100	70-90	50-75	25-35	10-15
	7-13	Loam	CL	A-6	0	0	100	90-100	70-90	50-75	25-35	10-15
	13-16	Loam	CL, CL-ML, SC-SM	A-4, A-6	0	0-3	90-95	90-95	70-90	50-75	20-30	5-15
	16-24	Loam	CL, CL-ML, SC-SM	A-4, A-6	0	0-3	90-95	90-95	70-90	50-75	20-30	5-15
	24-28	Sandy loam	CL, SC, CL-ML, SC-SM	A-4, A-6	0	0-3	90-95	90-95	60-85	45-60	20-30	5-15
	28-36	Loamy sand	SW, SM	A-1-b	0	0-3	85-95	85-95	20-40	3-25	0-14	NP
	36-60	Sand, loamy sand, gravelly coarse sand	SW, SM, GP, GM	A-1-b	0	2-10	50-90	50-85	15-35	3-25	0-14	NP
Urban land.												

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
4177B:												
Saude-----------	0-7	Loam	CL	A-6	0	0	100	90-100	70-90	50-75	25-35	10-15
	7-13	Loam	CL	A-6	0	0	100	90-100	70-90	50-75	25-35	10-15
	13-16	Loam	CL, CL-ML, SC-SM	A-4, A-6	0	0-3	90-95	90-95	70-90	50-75	20-30	5-15
	16-24	Loam	CL, CL-ML, SC-SM	A-4, A-6	0	0-3	90-95	90-95	70-90	50-75	20-30	5-15
	24-28	Sandy loam	CL, SC, CL-ML, SC-SM	A-4, A-6	0	0-3	90-95	90-95	60-85	45-60	20-30	5-15
	28-36	Loamy sand	SW, SM	A-1-b	0	0-3	85-95	85-95	20-40	3-25	0-14	NP
	36-60	Sand, loamy sand, gravelly coarse sand	SW, SM, GP, GM	A-1-b	0	2-10	50-90	50-85	15-35	3-25	0-14	NP
Urban land.												
4178:												
Waukee----------	0-8	Silt loam, loam	CL	A-6	0	0	100	90-100	70-90	50-75	30-40	10-20
	8-16	Silt loam, loam	CL	A-6	0	0	100	90-100	70-90	50-75	30-40	10-20
	16-20	Loam, sandy clay loam	CL, SC-SM, SC, CL-ML	A-6, A-4	0	0-3	90-95	90-95	65-85	40-60	20-35	5-15
	20-35	Loam, sandy clay loam	CL, SC-SM, SC, CL-ML	A-6, A-4	0	0-3	90-95	90-95	65-85	40-60	20-35	5-15
	35-44	Gravelly loamy coarse sand	SW, SM, SP-SM, SP	A-1-b	0-5	0-10	60-90	60-85	20-40	3-25	0-14	NP
	44-66	Gravelly loamy coarse sand, gravelly sand	SW, SM, SP-SM, SP	A-1-b	0-5	0-10	60-90	60-85	20-40	3-25	0-14	NP
Urban land.												
4184:												
Klinger---------	0-9	Silt loam, silty clay loam	CL	A-7-6	0	0	100	100	100	95-100	40-50	15-25
	9-13	Silt loam, silty clay loam	CL	A-7-6	0	0	100	100	100	95-100	40-50	15-25
	13-19	Silty clay loam	CL	A-7-6	0	0	100	100	100	95-100	40-50	15-25
	19-31	Silty clay loam	CL	A-7-6	0	0	100	100	100	95-100	40-50	20-30
	31-40	Clay loam, loam	CL	A-6	0	0-5	90-95	85-95	75-85	55-65	25-35	10-20
	40-46	Loam, clay loam	CL	A-6	0	0-5	90-95	85-95	75-85	55-65	25-35	10-20
	46-64	Loam	CL	A-6	0	0-5	90-95	85-95	75-85	55-65	25-35	10-20
Urban land.												

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
4198B:												
Floyd-----------	0-8	Clay loam, loam	OL, ML, CL	A-4, A-6	0	0	100	100	80-90	55-75	30-40	5-15
	8-24	Clay loam, loam	OL, ML, CL	A-4, A-6	0	0	100	100	80-90	55-75	30-40	5-15
	24-33	Loam, sandy clay loam	CL	A-6	0	0-5	90-95	85-95	50-70	50-65	25-35	11-20
	33-41	Sandy loam, sandy clay loam, loam	SM, SC-SM	A-2-4	0	0-5	90-95	85-95	50-70	15-35	10-20	NP-5
	41-50	Clay loam, loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	25-35	11-20
	50-60	Clay loam, loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	25-35	11-20
Urban land.												
4226:												
Lawler, 24 to 40 inches to sand and gravel-----	0-8	Silt loam, loam	CL, ML	A-6, A-7	0	0	100	90-100	70-90	55-90	35-45	10-20
	8-15	Silt loam, loam	CL, ML	A-6, A-7	0	0	100	90-100	70-90	55-90	35-45	10-20
	15-21	Loam, clay loam	CL, ML	A-6, A-7	0	0	100	90-100	70-90	55-75	35-45	10-20
	21-32	Sandy clay loam, loam	CL, SC	A-6	0	0-5	90-95	85-95	70-85	45-65	25-40	10-20
	32-37	Sandy clay loam	CL, SC	A-6	0	0-5	90-95	85-95	70-85	45-65	25-40	10-20
	37-60	Coarse sand, loamy coarse sand, very gravelly sand, very gravelly loamy sand	SW, GP, SP, SW-SM	A-1	0	0-10	50-90	50-85	15-35	3-10	0-14	NP
Urban land.												
4284:												
Flagler---------	0-8	Sandy loam, fine sandy loam	SC, SC-SM	A-2-4, A-4	0	0	95-100	90-95	60-70	25-40	15-25	5-10
	8-15	Sandy loam, fine sandy loam	SC, SC-SM	A-2-4, A-4	0	0	95-100	90-95	60-70	25-40	15-25	5-10
	15-22	Sandy loam	SC, SC-SM	A-2-4, A-4	0	0	95-100	90-95	50-70	25-40	15-25	5-10
	22-33	Sandy loam	SC, SC-SM	A-2-4, A-4	0	0	95-100	90-95	50-70	25-40	15-25	5-10
	33-65	Sand, loamy sand	SP-SM, SW, SP, SW-SM	A-1-b	0	0-2	85-95	85-95	20-40	3-12	0-14	NP
Urban land.												

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
4284B:												
Flagler---------	0-8	Sandy loam, fine sandy loam	SC, SC-SM	A-2-4, A-4	0	0	95-100	90-95	60-70	25-40	15-25	5-10
	8-15	Sandy loam, fine sandy loam	SC, SC-SM	A-2-4, A-4	0	0	95-100	90-95	60-70	25-40	15-25	5-10
	15-22	Sandy loam	SC, SC-SM	A-2-4, A-4	0	0	95-100	90-95	50-70	25-40	15-25	5-10
	22-33	Sandy loam	SC, SC-SM	A-2-4, A-4	0	0	95-100	90-95	50-70	25-40	15-25	5-10
	33-65	Sand, loamy sand	SP-SM, SW, SP, SW-SM	A-1-b	0	0-2	85-95	85-95	20-40	3-12	0-14	NP
Urban land.												
4377B:												
Dinsdale--------	0-7	Silt loam, silty clay loam	CL	A-6, A-7-6	0	0	100	100	100	95-100	35-50	12-23
	7-15	Silt loam, silty clay loam	CL	A-6, A-7-6	0	0	100	100	100	95-100	35-50	12-23
	15-21	Silty clay loam	CL	A-7-6	0	0	100	100	100	95-100	40-50	15-25
	21-36	Silty clay loam	CL	A-7-6	0	0	100	100	100	95-100	40-50	15-25
	36-50	Clay loam, loam	CL	A-6	0	0-5	90-95	90-95	75-85	55-65	25-35	10-20
	50-80	Clay loam, loam	CL	A-6	0	0-5	90-95	90-95	75-85	55-65	25-35	10-20
Urban land.												
4377C:												
Dinsdale--------	0-7	Silt loam, silty clay loam	CL	A-6, A-7-6	0	0	100	100	100	95-100	35-50	12-23
	7-15	Silt loam, silty clay loam	CL	A-6, A-7-6	0	0	100	100	100	95-100	35-50	12-23
	15-21	Silty clay loam	CL	A-7-6	0	0	100	100	100	95-100	40-50	15-25
	21-36	Silty clay loam	CL	A-7-6	0	0	100	100	100	95-100	40-50	15-25
	36-50	Clay loam, loam	CL	A-6	0	0-5	90-95	90-95	75-85	55-65	25-35	10-20
	50-80	Clay loam, loam	CL	A-6	0	0-5	90-95	90-95	75-85	55-65	25-35	10-20
Urban land.												

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
4382:												
Maxfield--------	0-7	Silty clay loam	CL, CH	A-7-6	0	0	100	100	100	95-100	45-55	20-30
	7-17	Silty clay loam	CL, CH	A-7-6	0	0	100	100	100	95-100	45-55	20-30
	17-23	Silty clay loam	CH, CL	A-7-6	0	0	100	100	100	95-100	45-55	25-35
	23-32	Silt loam	CH, CL	A-7-6	0	0	100	100	100	95-100	45-55	25-35
	32-45	Loam	CL	A-6	0	0-5	90-95	90-95	75-85	55-65	25-35	10-20
	45-66	Loam	CL	A-6	0	0-5	90-95	90-95	75-85	55-65	25-35	10-20
Urban land.												
4391B:												
Clyde-----------	0-8	Loam, silty clay loam, clay loam	OL, MH, ML, OH	A-7	0	0-5	95-100	95-100	80-90	55-75	45-60	15-25
	8-17	Silty clay loam, clay loam	OL, MH, ML, OH	A-7	0	0-5	95-100	95-100	80-90	55-75	45-60	15-25
	17-23	Silty clay loam, clay loam	OL, MH, ML, OH	A-7	0	0-5	95-100	95-100	80-90	55-75	45-60	15-25
	23-41	Silty clay loam, clay loam	CL, ML	A-6, A-7	0	0-5	95-100	90-95	75-90	50-75	30-50	10-20
	41-44	Sandy loam, loam	SM, SC-SM	A-2-4	0	2-5	85-95	85-95	50-80	15-35	15-20	NP-5
	44-54	Loam, clay loam	CL, SC	A-6	0-5	2-5	90-95	85-95	75-90	45-65	25-35	10-20
	54-66	Loam, clay loam	CL, SC	A-6	0-5	2-5	90-95	85-95	75-90	45-65	25-35	10-20
Floyd-----------	0-8	Clay loam, loam	OL, ML, CL	A-4, A-6	0	0	100	100	80-90	55-75	30-40	5-15
	8-24	Clay loam, loam	OL, ML, CL	A-4, A-6	0	0	100	100	80-90	55-75	30-40	5-15
	24-33	Loam, sandy clay loam	CL	A-6	0	0-5	90-95	85-95	50-70	50-65	25-35	11-20
	33-41	Sandy loam, sandy clay loam, loam	SM, SC-SM	A-2-4	0	0-5	90-95	85-95	50-70	15-35	10-20	NP-5
	41-50	Clay loam, loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	25-35	11-20
	50-60	Clay loam, loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	25-35	11-20
Urban land.												

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
4398:												
Tripoli---------	0-9	Silty clay loam, clay loam	CL	A-6, A-7	0	0	95-100	95-100	85-95	55-75	35-45	15-25
	9-18	Silty clay loam, clay loam	CL	A-6, A-7	0	0	95-100	95-100	85-95	55-75	35-45	15-25
	18-24	Clay loam	CL	A-6	0	0-5	90-95	90-95	75-85	55-65	30-40	11-20
	24-38	Loam	CL	A-6	0	0-5	90-95	90-95	75-85	55-65	30-40	11-20
	38-66	Clay loam, loam	CL, SC	A-6	0	0-5	90-95	90-95	75-85	45-65	30-40	11-20
Urban land.												
4399:												
Readlyn---------	0-7	Clay loam, loam	CL	A-6	0	0	95-100	95-100	85-95	55-75	30-40	15-25
	7-17	Clay loam, loam	CL	A-6	0	0	95-100	95-100	85-95	55-75	30-40	15-25
	17-43	Loam	CL, SC	A-6	0	0-5	90-95	90-95	75-85	45-65	30-40	10-20
	43-52	Loam	CL, SC	A-6	0	0-5	90-95	90-95	75-85	45-65	25-35	10-20
	52-60	Loam	CL, SC	A-6	0	0-5	90-95	90-95	75-85	45-65	25-35	10-20
Urban land.												
4408B:												
Olin------------	0-7	Sandy loam, fine sandy loam	SC-SM, SC	A-2, A-4	0	0	100	95-100	85-95	30-50	20-30	5-10
	7-23	Fine sandy loam, sandy loam	SC-SM, SC	A-2, A-4	0	0	100	95-100	85-95	30-50	20-30	5-10
	23-31	Sandy loam	SC-SM, SC	A-2, A-4	0	0	100	95-100	85-95	30-50	20-30	5-10
	31-52	Sandy clay loam, clay loam, loam	CL	A-6	0	0-5	90-95	90-95	80-90	50-65	25-35	10-20
	52-80	Clay loam, loam	CL	A-6	0	0-5	90-95	90-95	80-90	50-65	25-35	10-20
Urban land.												

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
4408C:												
Olin------------	0-7	Sandy loam, fine sandy loam	SC-SM, SC	A-2, A-4	0	0	100	95-100	85-95	30-50	20-30	5-10
	7-23	Fine sandy loam, sandy loam	SC-SM, SC	A-2, A-4	0	0	100	95-100	85-95	30-50	20-30	5-10
	23-31	Sandy loam	SC-SM, SC	A-2, A-4	0	0	100	95-100	85-95	30-50	20-30	5-10
	31-52	Sandy clay loam, clay loam, loam	CL	A-6	0	0-5	90-95	90-95	80-90	50-65	25-35	10-20
	52-80	Clay loam, loam	CL	A-6	0	0-5	90-95	90-95	80-90	50-65	25-35	10-20
Urban land.												
4426B:												
Aredale---------	0-7	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	95-100	85-95	55-75	25-35	5-15
	7-19	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	95-100	85-95	55-75	25-35	5-15
	19-33	Clay loam, loam	CL	A-6	0	0-5	95-100	95-100	80-90	50-70	30-40	10-20
	33-55	Sandy loam	SC, SM, SC-SM	A-2-4, A-4	0	0-5	95-100	95-100	70-90	20-50	15-25	NP-10
	55-70	Loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	25-35	11-20
Urban land.												
4426C:												
Aredale---------	0-7	Loam	CL, CL-ML	A-6, A-4	0	0	95-100	95-100	85-95	55-75	25-35	5-15
	7-19	Loam	CL, CL-ML	A-6, A-4	0	0	95-100	95-100	85-95	55-75	25-35	5-15
	19-33	Clay loam, loam	CL	A-6	0	0-5	95-100	95-100	80-90	50-70	30-40	10-20
	33-55	Sandy loam	SC, SM, SC-SM	A-2-4, A-4	0	0-5	95-100	95-100	70-90	20-50	15-25	NP-10
	55-70	Loam	CL	A-6	0	0-5	90-95	85-95	80-90	50-65	25-35	11-20
Urban land.												
4585:												
Spillville, occasionally flooded--------	0-8	Loam	CL	A-6	0	0	100	95-100	85-95	60-80	25-40	10-20
	8-54	Loam	CL	A-6	0	0	100	95-100	85-95	60-80	25-40	10-20
	54-60	Sandy loam, sandy clay loam, loam	CL, CL-ML, SC-SM, SC	A-4, A-6	0	0	100	95-100	80-90	35-75	20-40	5-15

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
4585:												
Coland, occasionally flooded--------	0-8	Clay loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	95-100	65-80	35-50	15-25
	8-32	Clay loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	95-100	65-80	35-50	15-25
	32-40	Loam, clay loam	CL	A-7-6, A-6	0	0	100	100	95-100	65-80	35-50	15-25
	40-44	Clay loam, loam, sandy loam	CL, SC, CL-ML, SC-SM	A-4, A-6	0	0	100	90-100	60-70	40-60	20-40	5-15
	44-52	Sandy loam, clay loam, loam	CL, SC, CL-ML, SC-SM	A-4, A-6	0	0	100	90-100	60-70	40-60	20-40	5-15
	52-60	Loam, clay loam, sandy loam	CL, SC, CL-ML, SC-SM	A-4, A-6	0	0	100	90-100	60-70	40-60	20-40	5-15
Urban land.												
4761:												
Franklin--------	0-6	Silt loam	CL-ML, CL	A-4, A-6	0	0	100	100	100	95-100	25-35	5-15
	6-13	Silt loam	CL-ML, CL	A-4, A-6	0	0	100	100	100	95-100	25-35	5-15
	13-18	Silty clay loam	CL	A-7-6	0	0	100	100	100	95-100	40-50	20-30
	18-28	Silty clay loam	CL	A-7-6	0	0	100	100	100	95-100	40-50	20-30
	28-37	Clay loam, loam	CL	A-6	0	0-5	95-100	90-95	75-85	55-65	25-35	10-20
	37-46	Loam, clay loam	CL	A-6	0	0-5	95-100	90-95	75-85	55-65	25-35	10-20
	46-64	Loam, clay loam	CL	A-6	0	0-5	95-100	90-95	75-85	55-65	25-35	10-20
	64-74	Clay loam, loam	CL	A-6	0	0-5	95-100	90-95	75-85	55-65	25-35	10-20
Urban land.												
4771B:												
Waubeek---------	0-7	Silt loam	CL-ML, CL	A-6, A-4	0	0	100	100	100	95-100	25-35	5-15
	7-13	Silt loam	CL-ML, CL	A-4, A-6	0	0	100	100	100	95-100	25-35	5-15
	13-29	Silt loam, silty clay loam	CL	A-7-6	0	0	100	100	100	95-100	40-50	15-25
	29-34	Clay loam, loam	CL	A-6	0	0-5	90-95	85-95	75-85	50-65	25-35	10-20
	34-45	Loam, clay loam	CL	A-6	0	0-5	90-95	85-95	75-85	50-65	25-35	10-20
	45-67	Clay loam, loam	CL	A-6	0	0-5	90-95	85-95	75-85	50-65	25-35	10-20
Urban land.												

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
4771D:												
Waubeek---------	0-7	Silt loam	CL-ML, CL	A-6, A-4	0	0	100	100	100	95-100	25-35	5-15
	7-13	Silt loam	CL-ML, CL	A-4, A-6	0	0	100	100	100	95-100	25-35	5-15
	13-29	Silt loam, silty clay loam	CL	A-7-6	0	0	100	100	100	95-100	40-50	15-25
	29-34	Clay loam, loam	CL	A-6	0	0-5	90-95	85-95	75-85	50-65	25-35	10-20
	34-45	Loam, clay loam	CL	A-6	0	0-5	90-95	85-95	75-85	50-65	25-35	10-20
	45-67	Clay loam, loam	CL	A-6	0	0-5	90-95	85-95	75-85	50-65	25-35	10-20
Urban land.												
4798:												
Protivin--------	0-8	Clay loam, loam	CL	A-7, A-6	0	0	95-100	95-100	85-95	60-75	30-45	10-25
	8-15	Clay loam, loam	CL	A-7, A-6	0	0	95-100	95-100	85-95	60-75	30-45	10-25
	15-19	Loam, clay loam	CL	A-6	0	0-5	90-95	85-95	75-85	55-65	35-40	15-20
	19-23	Loam, clay loam	CL	A-6	0	0-5	90-95	85-95	75-85	55-65	35-40	15-20
	23-45	Clay loam	CL	A-6	0	0-5	90-95	85-95	75-85	55-65	30-40	15-25
	45-60	Clay loam	CL	A-6	0	2-5	90-95	85-95	75-85	55-65	30-40	15-25
Urban land.												
4911B:												
Colo------------	0-8	Silt loam, silty clay loam	CL, CH	A-7	0	0	100	100	90-100	90-100	40-60	15-30
	8-34	Silt loam, silty clay loam	CL, CH	A-7	0	0	100	100	90-100	90-100	40-60	15-30
	34-40	Silty clay loam	CL, CH	A-7	0	0	100	100	90-100	90-100	40-60	15-30
	40-46	Silty clay loam	CL, CH	A-7	0	0	100	100	90-100	90-100	40-55	20-30
	46-52	Silty clay loam	CL, CH	A-7	0	0	100	100	90-100	90-100	40-55	20-30
	52-60	Clay loam, silty clay loam, silt loam	CL, CH	A-7	0	0	100	100	95-100	80-100	40-55	15-30

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
4911B:												
Ely-------------	0-8	Silt loam, silty clay loam	CL, OL, OH, MH	A-7-6, A-6	0	0	100	100	95-100	95-100	30-55	10-25
	8-24	Silt loam, silty clay loam	CL, OL, OH, MH	A-7-6, A-6	0	0	100	100	95-100	95-100	30-55	10-25
	24-32	Silty clay loam	CL, ML	A-6, A-7-6	0	0	100	100	95-100	95-100	30-55	10-25
	32-47	Silty clay loam	CL, ML	A-7-6, A-6	0	0	100	100	95-100	95-100	35-50	10-25
	47-58	Silty clay loam	CL	A-6	0	0	100	100	90-100	85-100	25-40	10-20
	58-80	Loam, clay loam, silt loam, silty clay loam	CL	A-6	0	0	95-100	95-100	80-95	65-95	25-40	10-20
Urban land.												
4933:												
Sawmill, occasionally flooded--------	0-10	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-100	30-50	15-30
	10-25	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-100	30-50	15-30
	25-32	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-100	30-50	15-30
	32-40	Silty clay loam	CL	A-6, A-7, A-4	0	0	100	100	85-100	80-95	25-50	8-25
	40-58	Silty clay loam, clay loam, loam	CL	A-6, A-7, A-4	0	0	100	100	85-100	70-95	25-50	8-25
	58-65	Clay loam, loam, silty clay loam	CL	A-4, A-6, A-7	0	0	100	100	75-100	65-95	20-50	8-30
Urban land.												
4946:												
Orthents, loamy.												
Urban land.												
5010.												
Pits, sand and gravel												
5030.												
Pits, limestone quarries												

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	Percentage passing sieve number--: 10	Percentage passing sieve number--: 40	Percentage passing sieve number--: 200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
5040. Orthents, loamy												
5053. Psammaquents, frequently flooded												
5080. Orthents, sanitary landfill												
AW. Animal waste												
SL. Sewage lagoon												
W. Water												

Table 19.--Physical Properties of the Soils

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer. Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
7:												
Wiota	0-8	24-32	1.30-1.35	0.6-2	0.21-0.23	2.3-4.8	3.5-4.5	.28	.28	5	6	48
	8-22	24-32	1.30-1.35	0.6-2	0.21-0.23	2.3-4.8	1.0-3.0	.28	.28			
	22-28	30-36	1.30-1.35	0.6-2	0.18-0.20	4.2-6.1	1.0-2.0	.28	.28			
	28-48	30-36	1.30-1.40	0.6-2	0.18-0.20	4.2-6.1	0.5-1.0	.43	.43			
	48-54	25-34	1.40-1.45	0.6-2	0.18-0.20	2.6-5.4	0.0-0.5	.43	.43			
	54-80	4-10	1.55-1.65	6-20	0.08-0.10	0.0-0.0	0.0-0.5	.20	.20			
41:												
Sparta	0-11	3-10	1.20-1.40	2-6	0.09-0.12	0.0-0.0	1.0-2.0	.17	.17	5	2	134
	11-15	3-10	1.20-1.40	2-6	0.09-0.12	0.0-0.0	0.5-1.0	.17	.17			
	15-34	1-8	1.40-1.60	6-20	0.05-0.11	0.0-0.0	0.0-0.5	.15	.15			
	34-60	0-5	1.50-1.70	6-20	0.04-0.07	0.0-0.0	0.0-0.5	.15	.15			
41B:												
Sparta	0-11	3-10	1.20-1.40	2-6	0.09-0.12	0.0-0.0	1.0-2.0	.17	.17	5	2	134
	11-15	3-10	1.20-1.40	2-6	0.09-0.12	0.0-0.0	0.5-1.0	.17	.17			
	15-34	1-8	1.40-1.60	6-20	0.05-0.11	0.0-0.0	0.0-0.5	.15	.15			
	34-60	0-5	1.50-1.70	6-20	0.04-0.07	0.0-0.0	0.0-0.5	.15	.15			
41C:												
Sparta	0-9	3-10	1.20-1.40	2-6	0.09-0.12	0.0-0.0	1.0-2.0	.17	.17	5	2	134
	9-14	3-10	1.20-1.40	2-6	0.09-0.12	0.0-0.0	0.5-1.0	.17	.17			
	14-32	1-8	1.40-1.60	6-20	0.05-0.11	0.0-0.0	0.0-0.5	.15	.15			
	32-60	0-5	1.50-1.70	6-20	0.04-0.07	0.0-0.0	0.0-0.5	.15	.15			
41D:												
Sparta	0-9	3-10	1.20-1.40	2-6	0.09-0.12	0.0-0.0	1.0-2.0	.17	.17	5	2	134
	9-14	3-10	1.20-1.40	2-6	0.09-0.12	0.0-0.0	0.5-1.0	.17	.17			
	14-30	1-8	1.40-1.60	6-20	0.05-0.11	0.0-0.0	0.0-0.5	.15	.15			
	30-60	0-5	1.50-1.70	6-20	0.04-0.07	0.0-0.0	0.0-0.5	.15	.15			
63B:												
Chelsea	0-8	8-15	1.50-1.55	6-20	0.10-0.15	0.0-0.0	0.5-1.5	.17	.17	5	2	134
	8-36	5-10	1.55-1.70	6-20	0.06-0.08	0.0-0.0	0.0-0.5	.17	.17			
	36-70	5-10	1.55-1.70	6-20	0.06-0.08	0.0-0.0	0.0-0.5	.17	.17			
63C:												
Chelsea	0-8	8-15	1.50-1.55	6-20	0.10-0.15	0.0-0.0	0.5-1.5	.17	.17	5	2	134
	8-36	5-10	1.55-1.70	6-20	0.06-0.08	0.0-0.0	0.0-0.5	.17	.17			
	36-70	5-10	1.55-1.70	6-20	0.06-0.08	0.0-0.0	0.0-0.5	.17	.17			
63D:												
Chelsea	0-8	8-15	1.50-1.55	6-20	0.10-0.15	0.0-0.0	0.5-1.5	.17	.17	5	2	134
	8-32	5-10	1.55-1.70	6-20	0.06-0.08	0.0-0.0	0.0-0.5	.17	.17			
	32-70	5-10	1.55-1.70	6-20	0.06-0.08	0.0-0.0	0.0-0.5	.17	.17			
83B:												
Kenyon	0-8	18-26	1.40-1.45	0.6-2	0.20-0.22	0.4-2.9	3.0-4.0	.24	.24	5	6	48
	8-14	18-26	1.40-1.45	0.6-2	0.20-0.22	0.4-2.9	2.0-3.0	.24	.24			
	14-19	18-26	1.40-1.45	0.6-2	0.20-0.22	0.4-2.9	1.0-3.0	.24	.24			
	19-47	20-30	1.45-1.65	0.6-2	0.17-0.19	1.0-4.2	0.0-1.0	.28	.28			
	47-54	20-24	1.65-1.75	0.6-2	0.17-0.19	1.0-2.3	0.0-0.5	.37	.37			
	54-76	20-24	1.65-1.75	0.6-2	0.17-0.19	1.0-2.3	0.0-0.5	.37	.37			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors			Wind erodi-bility group	Wind erodi-bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
83C:												
Kenyon----------------	0-8	18-26	1.40-1.45	0.6-2	0.20-0.22	0.4-2.9	3.0-4.0	.24	.24	5	6	48
	8-14	18-26	1.40-1.45	0.6-2	0.20-0.22	0.4-2.9	2.0-3.0	.24	.24			
	14-19	18-26	1.40-1.45	0.6-2	0.20-0.22	0.4-2.9	1.0-3.0	.24	.24			
	19-47	20-30	1.45-1.65	0.6-2	0.17-0.19	1.0-4.2	0.0-1.0	.28	.28			
	47-54	20-24	1.65-1.75	0.6-2	0.17-0.19	1.0-2.3	0.0-0.5	.37	.37			
	54-76	20-24	1.65-1.75	0.6-2	0.17-0.19	1.0-2.3	0.0-0.5	.37	.37			
83C2:												
Kenyon, moderately eroded---------------	0-8	18-26	1.40-1.45	0.6-2	0.20-0.22	0.4-2.9	2.2-3.2	.24	.24	5	6	48
	8-14	18-26	1.40-1.45	0.6-2	0.20-0.22	0.4-2.9	0.5-2.0	.24	.24			
	14-40	20-30	1.45-1.65	0.6-2	0.17-0.19	1.0-4.2	0.0-1.0	.28	.28			
	40-46	20-24	1.65-1.75	0.6-2	0.17-0.19	1.0-2.3	0.0-0.5	.37	.37			
	46-76	20-24	1.65-1.75	0.6-2	0.17-0.19	1.0-2.3	0.0-0.5	.37	.37			
83D2:												
Kenyon, moderately eroded---------------	0-8	18-26	1.40-1.45	0.6-2	0.20-0.22	0.4-2.9	2.2-3.2	.24	.24	5	6	48
	8-14	18-26	1.40-1.45	0.6-2	0.20-0.22	0.4-2.9	0.5-2.0	.24	.24			
	14-40	20-30	1.45-1.65	0.6-2	0.17-0.19	1.0-4.2	0.0-1.0	.28	.28			
	40-46	20-24	1.65-1.75	0.6-2	0.17-0.19	1.0-2.3	0.0-0.5	.37	.37			
	46-76	20-24	1.65-1.75	0.6-2	0.17-0.19	1.0-2.3	0.0-0.5	.37	.37			
84:												
Clyde-----------------	0-8	25-32	1.35-1.40	0.6-2	0.21-0.23	2.6-4.8	6.0-9.0	.28	.28	5	7	38
	8-17	28-32	1.35-1.40	0.6-2	0.21-0.23	3.5-4.8	2.0-6.0	.28	.28			
	17-23	28-32	1.35-1.40	0.6-2	0.21-0.23	3.5-4.8	1.0-4.0	.28	.28			
	23-41	22-30	1.45-1.65	0.6-2	0.18-0.20	1.6-4.2	0.5-2.0	.37	.37			
	41-44	10-15	1.60-1.70	0.6-2	0.11-0.13	0.0-0.0	0.5-1.0	.37	.37			
	44-54	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.37	.37			
	54-66	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.37	.37			
88:												
Nevin-----------------	0-8	26-29	1.30-1.35	0.6-2	0.21-0.23	2.9-3.9	4.0-6.0	.28	.28	5	7	38
	8-24	26-29	1.30-1.35	0.6-2	0.21-0.23	2.9-3.9	2.0-4.0	.28	.28			
	24-30	26-29	1.30-1.35	0.6-2	0.21-0.23	2.9-3.9	1.0-3.0	.28	.28			
	30-46	30-35	1.30-1.40	0.6-2	0.18-0.20	4.2-5.8	0.5-2.0	.32	.32			
	46-58	25-36	1.25-1.35	0.6-2	0.18-0.20	2.6-6.1	0.5-2.0	.28	.28			
	58-80	3-10	1.30-1.35	0.6-2	0.05-0.10	0.0-0.0	0.0-0.5	.15	.15			
133:												
Colo, occasionally flooded--------------	0-8	25-36	1.28-1.32	0.6-2	0.21-0.23	2.6-6.1	5.0-7.0	.28	.28	5	7	38
	8-34	25-36	1.28-1.32	0.6-2	0.21-0.23	2.6-6.1	3.0-6.0	.28	.28			
	34-40	27-36	1.28-1.32	0.6-2	0.21-0.23	3.2-6.1	2.0-4.0	.28	.28			
	40-46	30-35	1.25-1.35	0.6-2	0.18-0.20	4.2-5.8	1.0-3.0	.28	.28			
	46-52	30-35	1.25-1.35	0.6-2	0.18-0.20	4.2-5.8	0.5-2.0	.28	.28			
	52-60	25-35	1.35-1.45	0.6-2	0.18-0.20	2.6-5.8	0.0-2.0	.32	.32			
135:												
Coland, occasionally flooded--------------	0-8	27-35	1.40-1.50	0.6-2	0.20-0.22	3.2-5.8	5.0-7.0	.24	.24	5	6	48
	8-32	27-35	1.40-1.50	0.6-2	0.20-0.22	3.2-5.8	3.0-6.0	.24	.24			
	32-40	25-35	1.40-1.50	0.6-2	0.20-0.22	2.6-5.8	2.0-4.0	.24	.24			
	40-44	12-28	1.50-1.65	0.6-6	0.13-0.17	0.0-3.5	0.0-2.0	.28	.28			
	44-52	12-28	1.50-1.65	0.6-6	0.13-0.17	0.0-3.5	0.0-2.0	.28	.28			
	52-66	12-28	1.50-1.65	0.6-6	0.13-0.17	0.0-3.5	0.0-1.0	.28	.28			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
159:												
Finchford-------------	0-8	5-10	1.50-1.55	6-20	0.10-0.12	0.0-0.0	1.0-2.0	.17	.17	5	2	134
	8-18	5-10	1.50-1.55	6-20	0.10-0.12	0.0-0.0	0.5-1.0	.17	.17			
	18-30	2-8	1.50-1.60	20-101	0.04-0.06	0.0-0.0	0.0-0.5	.15	.15			
	30-55	2-5	1.60-1.70	20-101	0.02-0.04	0.0-0.0	0.0-0.5	.15	.15			
	55-70	2-5	1.60-1.70	20-101	0.02-0.04	0.0-0.0	0.0-0.5	.15	.15			
	70-80	2-5	1.60-1.70	20-101	0.02-0.04	0.0-0.0	0.0-0.5	.15	.15			
159C:												
Finchford-------------	0-8	5-10	1.50-1.55	6-20	0.10-0.12	0.0-0.0	1.0-2.0	.17	.17	5	2	134
	8-15	5-10	1.50-1.55	6-20	0.10-0.12	0.0-0.0	0.5-1.0	.17	.17			
	15-26	2-8	1.50-1.60	20-101	0.04-0.06	0.0-0.0	0.0-0.5	.15	.15			
	26-50	2-5	1.60-1.70	20-101	0.02-0.04	0.0-0.0	0.0-0.5	.15	.15			
	50-65	2-5	1.60-1.70	20-101	0.02-0.04	0.0-0.0	0.0-0.5	.15	.15			
	65-80	2-5	1.60-1.70	20-101	0.02-0.04	0.0-0.0	0.0-0.5	.15	.15			
171B:												
Bassett---------------	0-8	18-25	1.45-1.50	0.6-2	0.19-0.21	0.4-2.6	2.5-3.5	.28	.28	5	6	48
	8-10	18-25	1.45-1.50	0.6-2	0.19-0.21	0.4-2.6	0.5-1.0	.28	.28			
	10-14	18-25	1.45-1.50	0.6-2	0.19-0.21	0.4-2.6	0.5-1.0	.28	.28			
	14-43	20-28	1.55-1.65	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.28	.28			
	43-59	20-28	1.55-1.65	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.28	.28			
	59-73	20-24	1.65-1.75	0.6-2	0.17-0.19	1.0-2.3	0.0-0.5	.37	.37			
175:												
Dickinson-------------	0-9	12-18	1.50-1.55	2-6	0.12-0.15	0.0-0.4	2.0-3.0	.20	.20	4	3	86
	9-18	10-18	1.45-1.55	2-6	0.12-0.15	0.0-0.4	0.5-2.5	.20	.20			
	18-30	10-18	1.45-1.55	6-20	0.12-0.15	0.0-0.4	0.0-0.5	.20	.20			
	30-36	5-10	1.55-1.65	6-20	0.08-0.10	0.0-0.0	0.0-0.5	.20	.20			
	36-60	5-10	1.60-1.70	6-20	0.02-0.04	0.0-0.0	0.0-0.5	.15	.15			
175B:												
Dickinson-------------	0-9	12-18	1.50-1.55	2-6	0.12-0.15	0.0-0.4	1.5-2.5	.20	.20	4	3	86
	9-18	10-18	1.45-1.55	2-6	0.12-0.15	0.0-0.4	0.5-2.5	.20	.20			
	18-30	10-18	1.45-1.55	6-20	0.12-0.15	0.0-0.4	0.0-0.5	.20	.20			
	30-36	5-10	1.55-1.65	6-20	0.08-0.10	0.0-0.0	0.0-0.5	.20	.20			
	36-60	5-10	1.60-1.70	6-20	0.02-0.04	0.0-0.0	0.0-0.5	.15	.15			
177:												
Saude-----------------	0-7	18-24	1.40-1.45	0.6-2	0.20-0.22	0.4-2.3	3.0-4.0	.24	.24	4	6	48
	7-13	18-24	1.40-1.45	0.6-2	0.20-0.22	0.4-2.3	2.0-4.0	.24	.24			
	13-16	12-18	1.40-1.50	0.6-6	0.15-0.19	0.0-0.4	1.0-3.0	.24	.24			
	16-24	12-18	1.40-1.50	0.6-6	0.15-0.19	0.0-0.4	0.5-1.0	.24	.24			
	24-28	12-18	1.40-1.50	0.6-6	0.15-0.19	0.0-0.4	0.5-1.0	.24	.24			
	28-36	2-8	1.50-1.75	20-101	0.02-0.06	0.0-0.0	0.0-0.5	.10	.20			
	36-60	2-8	1.50-1.75	20-101	0.02-0.06	0.0-0.0	0.0-0.5	.10	.20			
177B:												
Saude-----------------	0-7	18-24	1.40-1.45	0.6-2	0.20-0.22	0.4-2.3	3.0-4.0	.24	.24	4	6	48
	7-13	18-24	1.40-1.45	0.6-2	0.20-0.22	0.4-2.3	2.0-4.0	.24	.24			
	13-16	12-18	1.40-1.50	0.6-6	0.15-0.19	0.0-0.4	1.0-3.0	.24	.24			
	16-24	12-18	1.40-1.50	0.6-6	0.15-0.19	0.0-0.4	0.5-1.0	.24	.24			
	24-28	12-18	1.40-1.50	0.6-6	0.15-0.19	0.0-0.4	0.5-1.0	.24	.24			
	28-36	2-8	1.50-1.75	20-101	0.02-0.06	0.0-0.0	0.0-0.5	.10	.20			
	36-60	2-8	1.50-1.75	20-101	0.02-0.06	0.0-0.0	0.0-0.5	.10	.20			
178:												
Waukee----------------	0-8	18-24	1.40-1.45	0.6-2	0.20-0.22	0.4-2.3	3.0-4.0	.24	.24	4	6	48
	8-16	18-24	1.40-1.45	0.6-2	0.20-0.22	0.4-2.3	2.0-3.0	.24	.24			
	16-20	18-27	1.40-1.45	0.6-2	0.15-0.19	0.4-3.2	0.5-2.0	.28	.28			
	20-35	18-27	1.40-1.50	0.6-2	0.15-0.19	0.4-3.2	0.5-2.0	.28	.28			
	35-44	2-8	1.50-1.75	20-101	0.02-0.06	0.0-0.0	0.0-0.5	.10	.17			
	44-66	2-8	1.50-1.75	20-101	0.02-0.06	0.0-0.0	0.0-0.5	.10	.17			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
178B:												
Waukee----------------	0-8	18-24	1.40-1.45	0.6-2	0.20-0.22	0.4-2.3	3.0-4.0	.24	.24	4	6	48
	8-16	18-24	1.40-1.45	0.6-2	0.20-0.22	0.4-2.3	2.0-3.0	.24	.24			
	16-20	18-27	1.40-1.45	0.6-2	0.15-0.19	0.4-3.2	0.5-2.0	.28	.28			
	20-35	18-27	1.40-1.50	0.6-2	0.15-0.19	0.4-3.2	0.5-2.0	.28	.28			
	35-44	2-8	1.50-1.75	20-101	0.02-0.06	0.0-0.0	0.0-0.5	.10	.17			
	44-66	2-8	1.50-1.75	20-101	0.02-0.06	0.0-0.0	0.0-0.5	.10	.17			
184:												
Klinger---------------	0-9	25-30	1.30-1.35	0.6-2	0.22-0.24	2.6-4.2	5.0-6.0	.28	.28	5	7	38
	9-13	25-30	1.30-1.35	0.6-2	0.22-0.24	2.6-4.2	2.0-5.0	.28	.28			
	13-19	27-30	1.30-1.35	0.6-2	0.22-0.24	3.2-4.2	1.0-4.0	.28	.28			
	19-31	28-35	1.35-1.45	0.6-2	0.18-0.20	3.5-5.8	0.5-2.0	.43	.43			
	31-40	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.43	.43			
	40-46	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.43	.43			
	46-64	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.43	.43			
198B:												
Floyd-----------------	0-8	20-28	1.35-1.40	0.6-2	0.20-0.22	1.0-3.5	5.0-6.0	.24	.24	5	6	48
	8-24	20-28	1.35-1.40	0.6-2	0.20-0.22	1.0-3.5	2.0-5.0	.24	.24			
	24-33	18-24	1.40-1.60	0.6-2	0.16-0.18	0.4-2.3	1.0-2.0	.32	.32			
	33-41	6-24	1.35-1.40	2-6	0.11-0.13	0.0-2.3	0.5-1.0	.32	.32			
	41-50	18-30	1.40-1.65	0.6-2	0.16-0.18	0.4-4.2	0.0-1.0	.32	.32			
	50-60	18-30	1.65-1.80	0.6-2	0.16-0.18	0.4-4.2	0.0-0.5	.32	.32			
213B:												
Rockton, 30 to 40 inches to limestone--	0-10	18-27	1.30-1.40	0.6-2	0.20-0.22	0.4-3.2	3.0-4.0	.28	.28	3	6	48
	10-15	18-27	1.30-1.40	0.6-2	0.20-0.22	0.4-3.2	2.0-4.0	.28	.28			
	15-21	25-35	1.40-1.55	0.6-2	0.17-0.19	2.6-5.8	0.0-1.0	.28	.28			
	21-30	25-35	1.40-1.55	0.6-2	0.17-0.19	2.6-5.8	0.0-1.0	.28	.28			
	30-35	35-60	1.35-1.45	0.6-2	0.10-0.14	5.8-13.7	0.0-1.0	.28	.28			
	35-80	---	---	0.0-0.6	---	---	---	---	---			
221:												
Klossner--------------	0-10	25-30	0.30-0.40	0.2-6	0.35-0.45	---	50-100	.28	.28	2	2	134
	10-26	25-30	0.30-0.40	0.2-6	0.35-0.45	---	50-100	.28	.28			
	26-36	15-35	0.15-0.30	0.6-2	0.35-0.45	0.0-5.8	5.0-20	.37	.37			
	36-48	15-35	0.15-0.30	0.6-2	0.35-0.45	0.0-5.8	5.0-20	.37	.37			
	48-65	7-35	1.45-1.75	0.6-2	0.14-0.22	0.0-5.8	0.0-5.0	.37	.37			
	65-80	7-35	1.45-1.75	0.6-2	0.14-0.22	0.0-5.8	0.0-5.0	.37	.37			
284:												
Flagler---------------	0-8	12-18	1.50-1.55	2-6	0.12-0.14	0.0-0.4	1.5-2.5	.20	.20	4	3	86
	8-15	12-18	1.50-1.55	2-6	0.12-0.14	0.0-0.4	1.0-2.5	.20	.20			
	15-22	12-18	1.50-1.55	2-6	0.12-0.14	0.0-0.4	1.0-2.5	.20	.20			
	22-33	10-15	1.55-1.60	2-6	0.11-0.13	0.0-0.0	0.0-1.0	.20	.20			
	33-65	2-8	1.60-1.75	20-101	0.02-0.04	0.0-0.0	0.0-0.5	.20	.20			
284B:												
Flagler---------------	0-8	12-18	1.50-1.55	2-6	0.12-0.14	0.0-0.4	1.5-2.5	.20	.20	4	3	86
	8-15	12-18	1.50-1.55	2-6	0.12-0.14	0.0-0.4	1.0-2.5	.20	.20			
	15-22	12-18	1.50-1.55	2-6	0.12-0.14	0.0-0.4	1.0-2.5	.20	.20			
	22-33	10-15	1.55-1.60	2-6	0.11-0.13	0.0-0.0	0.0-1.0	.20	.20			
	33-65	2-8	1.60-1.75	20-101	0.02-0.04	0.0-0.0	0.0-0.5	.20	.20			
290:												
Dells-----------------	0-7	14-18	1.35-1.55	0.6-2	0.22-0.24	0.0-0.4	3.0-4.0	.32	.32	4	5	56
	7-16	14-18	1.35-1.55	0.6-2	0.22-0.24	0.0-0.4	0.0-0.5	.32	.32			
	16-28	20-32	1.55-1.65	0.6-2	0.18-0.22	1.0-4.8	0.0-0.5	.37	.37			
	28-33	10-25	1.55-1.65	0.6-2	0.12-0.19	0.0-2.6	0.0-0.5	.37	.37			
	33-60	2-8	1.55-1.70	6-20	0.05-0.10	0.0-0.0	0.0-0.5	.15	.15			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
354. Aquolls, ponded												
377B:												
Dinsdale--------------	0-7	25-29	1.25-1.30	0.6-2	0.21-0.23	2.6-3.9	3.0-4.0	.28	.28	5	7	38
	7-15	25-29	1.25-1.30	0.6-2	0.21-0.23	2.6-3.9	2.0-3.0	.28	.28			
	15-21	30-34	1.30-1.35	0.6-2	0.18-0.20	4.2-5.4	1.0-2.0	.28	.28			
	21-36	30-34	1.30-1.35	0.6-2	0.18-0.20	4.2-5.4	0.5-2.0	.43	.43			
	36-50	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.43	.43			
	50-80	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.43	.43			
377C:												
Dinsdale--------------	0-7	25-29	1.25-1.30	0.6-2	0.21-0.23	2.6-3.9	3.0-4.0	.28	.28	5	7	38
	7-15	25-29	1.25-1.30	0.6-2	0.21-0.23	2.6-3.9	2.0-3.0	.28	.28			
	15-21	30-34	1.30-1.35	0.6-2	0.18-0.20	4.2-5.4	1.0-2.0	.28	.28			
	21-36	30-34	1.30-1.35	0.6-2	0.18-0.20	4.2-5.4	0.5-2.0	.43	.43			
	36-50	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.43	.43			
	50-80	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.43	.43			
377C2:												
Dinsdale, moderately eroded---------------	0-8	25-29	1.25-1.30	0.6-2	0.21-0.23	2.6-3.9	2.2-3.2	.32	.32	5	7	38
	8-25	30-34	1.30-1.35	0.6-2	0.18-0.20	4.2-5.4	0.5-2.0	.43	.43			
	25-40	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.43	.43			
	40-80	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.43	.43			
382:												
Maxfield--------------	0-7	27-35	1.35-1.40	0.6-2	0.21-0.23	3.2-5.8	6.0-8.0	.28	.28	5	7	38
	7-17	27-35	1.35-1.40	0.6-2	0.21-0.23	3.2-5.8	3.0-6.0	.28	.28			
	17-23	25-34	1.40-1.50	0.6-2	0.18-0.20	2.6-5.4	0.5-2.0	.32	.32			
	23-32	25-34	1.40-1.50	0.6-2	0.18-0.20	2.6-5.4	0.5-2.0	.32	.32			
	32-45	20-26	1.65-1.75	0.6-2	0.17-0.19	1.0-2.9	0.0-0.5	.32	.32			
	45-66	20-26	1.65-1.75	0.6-2	0.17-0.19	1.0-2.9	0.0-0.5	.32	.32			
391B:												
Clyde-----------------	0-8	25-32	1.35-1.40	0.6-2	0.21-0.23	2.6-4.8	6.0-9.0	.28	.28	5	7	48
	8-17	28-32	1.35-1.40	0.6-2	0.21-0.23	3.5-4.8	2.0-6.0	.28	.28			
	17-23	28-32	1.35-1.40	0.6-2	0.21-0.23	3.5-4.8	1.0-4.0	.28	.28			
	23-41	22-30	1.45-1.65	0.6-2	0.18-0.20	1.6-4.2	0.5-2.0	.37	.37			
	41-44	10-15	1.60-1.70	0.6-2	0.11-0.13	0.0-0.0	0.5-1.0	.37	.37			
	44-54	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.37	.37			
	54-66	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.37	.37			
Floyd-----------------	0-8	20-28	1.35-1.40	0.6-2	0.20-0.22	1.0-3.5	5.0-6.0	.24	.24	5	7	48
	8-24	20-28	1.35-1.40	0.6-2	0.20-0.22	1.0-3.5	2.0-5.0	.24	.24			
	24-33	18-24	1.40-1.60	0.6-2	0.16-0.18	0.4-2.3	1.0-2.0	.32	.32			
	33-41	6-24	1.35-1.40	2-6	0.11-0.13	0.0-2.3	0.5-1.0	.32	.32			
	41-50	18-30	1.40-1.65	0.6-2	0.16-0.18	0.4-4.2	0.0-1.0	.32	.32			
	50-60	18-30	1.65-1.80	0.6-2	0.16-0.18	0.4-4.2	0.0-0.5	.32	.32			
395B:												
Marquis---------------	0-8	18-26	1.40-1.45	0.6-2	0.20-0.22	0.4-2.9	3.0-4.0	.24	.24	5	6	48
	8-19	18-26	1.40-1.45	0.6-2	0.20-0.22	0.4-2.9	3.0-4.0	.24	.24			
	19-24	20-30	1.45-1.65	0.6-2	0.17-0.19	1.0-4.2	1.0-2.0	.28	.28			
	24-54	20-24	1.65-1.75	0.6-2	0.17-0.19	1.0-2.3	0.0-1.0	.37	.37			
	54-80	20-24	1.65-1.75	0.6-2	0.17-0.19	1.0-2.3	0.0-0.5	.37	.37			
398:												
Tripoli---------------	0-9	28-32	1.40-1.45	0.6-2	0.19-0.21	3.5-4.8	6.0-7.0	.24	.24	5	6	48
	9-18	28-32	1.40-1.45	0.6-2	0.19-0.21	3.5-4.8	4.0-6.0	.24	.24			
	18-24	22-28	1.45-1.70	0.6-2	0.17-0.19	1.6-3.5	0.5-2.0	.24	.24			
	24-38	22-28	1.45-1.70	0.6-2	0.17-0.19	1.6-3.5	0.0-1.0	.28	.28			
	38-66	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.28	.28			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
399:												
Readlyn---------------	0-7	18-28	1.35-1.40	0.6-2	0.20-0.22	0.4-3.5	4.5-5.5	.24	.24	5	6	48
	7-17	18-28	1.35-1.40	0.6-2	0.20-0.22	0.4-3.5	3.0-4.5	.24	.24			
	17-43	22-28	1.45-1.70	0.6-2	0.17-0.19	1.6-3.5	1.0-3.0	.32	.32			
	43-52	18-24	1.70-1.80	0.6-2	0.17-0.19	0.4-2.3	0.0-0.5	.32	.32			
	52-60	18-24	1.70-1.80	0.6-2	0.17-0.19	0.4-2.3	0.0-0.5	.32	.32			
408B:												
Olin------------------	0-7	12-18	1.45-1.50	2-6	0.13-0.15	0.0-0.4	1.5-2.5	.20	.20	5	3	86
	7-23	12-18	1.45-1.50	2-6	0.13-0.15	0.0-0.4	1.0-2.0	.20	.20			
	23-31	12-18	1.45-1.50	2-6	0.13-0.15	0.0-0.4	0.0-1.0	.20	.20			
	31-52	20-28	1.50-1.70	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.37	.37			
	52-80	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.37	.37			
408C:												
Olin------------------	0-7	12-18	1.45-1.50	2-6	0.13-0.15	0.0-0.4	1.5-2.5	.20	.20	5	3	86
	7-23	12-18	1.45-1.50	2-6	0.13-0.15	0.0-0.4	1.0-2.0	.20	.20			
	23-31	12-18	1.45-1.50	2-6	0.13-0.15	0.0-0.4	0.0-1.0	.20	.20			
	31-52	20-28	1.50-1.70	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.37	.37			
	52-80	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.37	.37			
412C:												
Emeline---------------	0-9	12-27	1.15-1.20	0.6-2	0.17-0.22	0.0-3.2	2.5-3.5	.28	.28	1	6	48
	9-80	---	---	0.0-0.6	---	---	---	---	---			
426B:												
Aredale---------------	0-7	18-26	1.40-1.45	0.6-2	0.20-0.22	0.4-2.9	3.0-4.0	.24	.24	5	6	48
	7-19	18-26	1.40-1.45	0.6-2	0.20-0.22	0.4-2.9	2.0-3.0	.24	.24			
	19-33	18-28	1.45-1.65	0.6-2	0.17-0.19	0.4-3.5	0.5-1.0	.32	.32			
	33-55	8-15	1.60-1.70	2-6	0.11-0.13	0.0-0.0	0.0-0.5	.20	.20			
	55-70	18-24	1.70-1.80	0.2-0.6	0.17-0.19	0.4-2.3	0.0-0.5	.37	.37			
426C:												
Aredale---------------	0-7	18-26	1.40-1.45	0.6-2	0.20-0.22	0.4-2.9	3.0-4.0	.24	.24	5	6	48
	7-19	18-26	1.40-1.45	0.6-2	0.20-0.22	0.4-2.9	2.0-3.0	.24	.24			
	19-33	18-28	1.45-1.65	0.6-2	0.17-0.19	0.4-3.5	0.5-1.0	.32	.32			
	33-55	8-15	1.60-1.70	2-6	0.11-0.13	0.0-0.0	0.0-0.5	.20	.20			
	55-70	18-24	1.70-1.80	0.2-0.6	0.17-0.19	0.4-2.3	0.0-0.5	.37	.37			
426C2:												
Aredale, moderately eroded---------------	0-8	18-26	1.40-1.45	0.6-2	0.20-0.22	0.4-2.9	2.2-3.2	.24	.24	5	6	48
	8-32	18-28	1.45-1.65	0.6-2	0.17-0.19	0.4-3.5	0.5-1.0	.32	.32			
	32-50	8-15	1.60-1.70	2-6	0.11-0.13	0.0-0.0	0.0-0.5	.20	.20			
	50-70	18-24	1.70-1.80	0.2-0.6	0.17-0.19	0.4-2.3	0.0-0.5	.37	.37			
468B:												
Dunkerton-------------	0-9	5-18	1.45-1.50	2-6	0.13-0.15	0.0-0.4	0.5-1.5	.20	.20	5	3	86
	9-15	5-18	1.45-1.50	2-6	0.13-0.15	0.0-0.4	0.5-1.0	.20	.20			
	15-25	10-22	1.45-1.50	2-6	0.13-0.15	0.0-1.6	0.0-0.5	.20	.20			
	25-49	20-30	1.65-1.75	0.2-0.6	0.17-0.19	1.0-4.2	0.0-0.5	.37	.37			
	49-80	20-30	1.65-1.75	0.2-0.6	0.17-0.19	1.0-4.2	0.0-0.5	.37	.37			
468C:												
Dunkerton-------------	0-9	5-18	1.45-1.50	2-6	0.13-0.15	0.0-0.4	0.5-1.5	.20	.20	5	3	86
	9-15	5-18	1.45-1.50	2-6	0.13-0.15	0.0-0.4	0.5-1.0	.20	.20			
	15-25	10-30	1.45-1.50	2-6	0.13-0.15	0.0-4.2	0.0-0.5	.20	.20			
	25-49	20-30	1.65-1.75	0.2-0.6	0.17-0.19	1.0-4.2	0.0-0.5	.37	.37			
	49-80	20-30	1.65-1.75	0.2-0.6	0.17-0.19	1.0-4.2	0.0-0.5	.37	.37			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
471:												
Oran------------------	0-8	16-24	1.40-1.45	0.6-2	0.18-0.20	0.0-2.3	3.0-4.0	.24	.24	5	6	48
	8-14	16-24	1.40-1.45	0.6-2	0.18-0.20	0.0-2.3	0.5-1.0	.32	.32			
	14-19	16-24	1.40-1.45	0.6-2	0.18-0.20	0.0-2.3	0.5-1.0	.32	.32			
	19-42	22-28	1.45-1.70	0.6-2	0.17-0.19	1.6-3.5	0.0-0.5	.37	.37			
	42-80	20-26	1.45-1.70	0.6-2	0.17-0.19	1.0-2.9	0.0-0.5	.37	.37			
485:												
Spillville, occasionally flooded	0-8	18-26	1.45-1.55	0.6-2	0.19-0.21	0.4-2.9	4.0-5.0	.24	.24	5	6	48
	8-54	18-26	1.45-1.55	0.6-2	0.19-0.21	0.4-2.9	1.0-4.0	.24	.24			
	54-60	14-24	1.55-1.70	0.6-6	0.15-0.18	0.0-2.3	1.0-2.0	.28	.28			
585:												
Spillville, occasionally flooded	0-8	18-26	1.45-1.55	0.6-2	0.19-0.21	0.4-2.9	4.0-5.0	.24	.24	5	6	48
	8-54	18-26	1.45-1.55	0.6-2	0.19-0.21	0.4-2.9	1.0-4.0	.24	.24			
	54-60	14-24	1.55-1.70	0.6-6	0.15-0.18	0.0-2.3	1.0-2.0	.28	.28			
Coland, occasionally flooded--------------	0-8	27-35	1.40-1.50	0.6-2	0.20-0.22	3.2-5.8	5.0-7.0	.24	.24	5	6	48
	8-32	27-35	1.40-1.50	0.6-2	0.20-0.22	3.2-5.8	3.0-6.0	.24	.24			
	32-40	25-35	1.40-1.50	0.6-2	0.20-0.22	2.6-5.8	1.0-4.0	.24	.24			
	40-44	12-28	1.50-1.65	0.6-6	0.13-0.17	0.0-3.5	0.0-2.0	.28	.28			
	44-52	12-28	1.50-1.65	0.6-6	0.13-0.17	0.0-3.5	0.0-2.0	.28	.28			
	52-60	12-28	1.50-1.65	0.6-6	0.13-0.17	0.0-3.5	0.0-1.0	.28	.28			
626:												
Hayfield, 24 to 40 inches to sand and gravel---------------	0-8	18-27	1.30-1.50	0.6-2	0.20-0.24	0.4-3.2	3.0-4.0	.32	.32	4	6	48
	8-13	18-27	1.30-1.50	0.6-2	0.20-0.24	0.4-3.2	0.5-1.0	.32	.32			
	13-29	18-30	1.40-1.55	0.6-2	0.17-0.22	0.4-4.2	0.0-1.0	.32	.32			
	29-80	0-5	1.55-1.65	6-20	0.02-0.04	0.0-0.0	0.0-0.5	.15	.15			
761:												
Franklin--------------	0-6	18-25	1.30-1.35	0.6-2	0.21-0.23	0.4-2.6	3.0-4.0	.28	.28	5	6	48
	6-13	18-25	1.30-1.35	0.6-2	0.21-0.23	0.4-2.6	0.5-1.0	.28	.28			
	13-18	30-34	1.35-1.40	0.6-2	0.18-0.20	4.2-5.4	0.5-1.0	.37	.37			
	18-28	30-34	1.35-1.40	0.6-2	0.18-0.20	4.2-5.4	0.0-0.5	.37	.37			
	28-37	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.37	.37			
	37-46	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.37	.37			
	46-64	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.37	.37			
	64-74	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.37	.37			
771B:												
Waubeek---------------	0-7	18-26	1.25-1.30	0.6-2	0.21-0.23	0.4-2.9	2.5-3.5	.28	.28	5	6	48
	7-13	18-26	1.25-1.30	0.6-2	0.21-0.23	0.4-2.9	0.5-1.0	.28	.28			
	13-29	25-34	1.25-1.35	0.6-2	0.18-0.20	2.6-3.9	0.5-1.0	.37	.37			
	29-34	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-2.3	0.0-0.5	.37	.37			
	34-45	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-2.3	0.0-0.5	.37	.37			
	45-67	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-2.3	0.0-0.5	.37	.37			
775B:												
Billett---------------	0-8	5-15	1.40-1.70	2-6	0.13-0.18	0.0-0.0	1.0-2.0	.20	.20	4	3	86
	8-13	10-18	1.40-1.70	2-6	0.10-0.15	0.0-0.4	0.5-1.0	.20	.20			
	13-28	10-18	1.40-1.70	2-6	0.10-0.15	0.0-0.4	0.0-0.5	.15	.15			
	28-41	8-18	1.50-1.80	2-6	0.05-0.12	0.0-0.4	0.0-0.5	.15	.15			
	41-47	8-18	1.50-1.80	2-6	0.05-0.12	0.0-0.4	0.0-0.5	.15	.15			
	47-52	2-7	1.60-1.90	6-20	0.02-0.10	0.0-0.0	0.0-0.5	.10	.10			
	52-60	2-7	1.60-1.90	6-20	0.02-0.10	0.0-0.0	0.0-0.5	.10	.10			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
776C:												
Lilah-----------------	0-6	5-13	1.50-1.55	2-6	0.11-0.13	0.0-0.0	1.0-2.0	.20	.20	3	3	86
	6-15	10-15	1.55-1.65	2-6	0.10-0.12	0.0-0.0	0.0-0.5	.20	.20			
	15-28	2-10	1.55-1.80	20-101	0.02-0.04	0.0-0.0	0.0-0.5	.10	.10			
	28-39	2-10	1.55-1.80	20-101	0.02-0.04	0.0-0.0	0.0-0.5	.10	.10			
	39-60	2-6	1.55-1.80	20-101	0.02-0.04	0.0-0.0	0.0-0.5	.10	.10			
777:												
Wapsie----------------	0-8	12-20	1.40-1.45	0.6-2	0.18-0.20	0.0-1.0	3.0-4.0	.24	.24	4	6	56
	8-13	12-20	1.40-1.45	0.6-2	0.18-0.20	0.0-1.0	0.5-1.0	.24	.24			
	13-17	15-22	1.45-1.50	0.6-2	0.15-0.17	0.0-1.6	0.0-0.5	.28	.28			
	17-27	15-22	1.45-1.50	0.6-2	0.15-0.17	0.0-1.6	0.0-0.5	.28	.28			
	27-29	15-22	1.45-1.50	0.6-2	0.15-0.17	0.0-1.6	0.0-0.5	.28	.28			
	29-38	2-10	1.50-1.75	20-101	0.02-0.06	0.0-0.0	0.0-0.5	.10	.10			
	38-60	2-10	1.50-1.75	20-101	0.02-0.06	0.0-0.0	0.0-0.5	.10	.10			
781B:												
Lourdes---------------	0-8	18-27	1.45-1.60	0.6-2	0.18-0.20	0.4-3.2	3.0-4.0	.28	.28	5	6	48
	8-11	24-33	1.45-1.60	0.6-2	0.16-0.18	2.6-5.1	0.5-1.0	.32	.32			
	11-15	24-33	1.45-1.60	0.6-2	0.16-0.18	2.6-5.1	0.5-1.0	.32	.32			
	15-44	28-33	1.45-1.60	0.2-0.6	0.15-0.17	3.5-5.1	0.0-0.5	.37	.37			
	44-51	28-33	1.60-1.70	0.2-0.6	0.15-0.17	3.5-5.1	0.0-0.5	.37	.37			
	51-76	28-33	1.60-1.70	0.2-0.6	0.15-0.17	3.5-5.1	0.0-0.5	.37	.37			
781C2:												
Lourdes, moderately eroded---------------	0-8	18-27	1.45-1.60	0.6-2	0.18-0.20	0.4-3.2	2.2-3.2	.28	.28	5	6	48
	8-14	30-35	1.45-1.60	0.2-0.6	0.15-0.17	4.2-5.8	0.0-0.5	.37	.37			
	14-42	28-33	1.60-1.70	0.2-0.6	0.15-0.17	3.5-5.1	0.0-0.5	.37	.37			
	42-47	28-33	1.60-1.70	0.2-0.6	0.15-0.17	3.5-5.1	0.0-0.5	.37	.37			
	47-76	28-33	1.60-1.70	0.2-0.6	0.15-0.17	3.5-5.1	0.0-0.5	.37	.37			
782B:												
Donnan----------------	0-8	20-26	1.45-1.50	0.6-2	0.20-0.22	1.0-2.9	2.5-3.5	.28	.28	4	6	48
	8-13	20-26	1.45-1.50	0.6-2	0.20-0.22	1.0-2.9	0.5-1.0	.28	.28			
	13-18	20-26	1.45-1.50	0.6-2	0.20-0.22	1.0-2.9	0.5-1.0	.28	.28			
	18-24	20-30	1.45-1.55	0.6-2	0.17-0.19	1.0-4.2	0.0-0.5	.28	.28			
	24-48	42-55	1.65-1.80	0.0015-0.06	0.11-0.14	8.0-12.1	0.0-0.5	.28	.28			
	48-60	24-32	1.60-1.70	0.2-0.6	0.17-0.19	2.3-4.8	0.0-0.5	.28	.28			
798:												
Protivin--------------	0-8	20-27	1.45-1.50	0.6-2	0.18-0.20	1.0-3.2	6.0-7.0	.28	.28	5	6	48
	8-15	20-27	1.45-1.50	0.6-2	0.18-0.20	1.0-3.2	4.0-7.0	.28	.28			
	15-19	20-27	1.50-1.60	0.2-0.6	0.17-0.19	1.0-3.2	2.0-6.0	.37	.37			
	19-23	20-27	1.50-1.60	0.2-0.6	0.17-0.19	1.0-3.2	1.0-2.0	.37	.37			
	23-45	28-33	1.60-1.70	0.2-0.6	0.15-0.17	3.5-5.1	0.0-0.5	.37	.37			
	45-60	28-33	1.60-1.70	0.2-0.6	0.15-0.17	3.5-5.1	0.0-0.5	.37	.37			
809B:												
Bertram---------------	0-8	8-15	1.50-1.55	2-6	0.12-0.14	0.0-0.0	1.5-2.5	.20	.20	3	3	86
	8-17	8-15	1.50-1.55	2-6	0.12-0.14	0.0-0.0	1.0-2.5	.20	.20			
	17-30	12-18	1.55-1.60	2-6	0.11-0.13	0.0-0.4	0.5-1.0	.20	.20			
	30-34	20-32	1.60-1.80	0.2-0.6	0.14-0.16	1.0-4.8	0.0-0.5	.32	.32			
	34-36	8-12	1.60-1.80	0.2-0.6	0.14-0.16	0.0-0.0	0.0-0.5	.32	.32			
	36-80	---	---	0.0-0.6	---	---	---	---	---			
877B:												
Dinsmore--------------	0-8	25-29	1.25-1.30	0.6-2	0.21-0.23	2.6-3.9	3.0-4.0	.28	.28	5	7	38
	8-16	25-29	1.25-1.30	0.6-2	0.21-0.23	2.6-3.9	2.0-3.0	.28	.28			
	16-48	25-35	1.30-1.35	0.6-2	0.18-0.20	2.6-5.8	0.5-2.0	.37	.37			
	48-80	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.43	.43			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
884:												
Klingmore	0-8	26-30	1.30-1.35	0.6-2	0.22-0.24	2.9-4.2	5.0-6.0	.28	.28	5	6	38
	8-19	26-30	1.30-1.35	0.6-2	0.22-0.24	2.9-4.2	4.0-5.0	.28	.28			
	19-56	26-35	1.35-1.45	0.6-2	0.18-0.20	2.9-5.8	0.5-1.0	.37	.37			
	56-80	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.43	.43			
911B:												
Colo	0-8	25-36	1.28-1.32	0.6-2	0.21-0.23	2.6-6.1	5.0-7.0	.28	.28	5	7	38
	8-34	25-36	1.28-1.32	0.6-2	0.21-0.23	2.6-6.1	3.0-6.0	.28	.28			
	34-40	27-36	1.28-1.32	0.6-2	0.21-0.23	3.2-6.1	2.0-4.0	.28	.28			
	40-46	30-35	1.25-1.35	0.6-2	0.18-0.20	4.2-5.8	1.0-3.0	.28	.28			
	46-52	30-35	1.25-1.35	0.6-2	0.18-0.20	4.2-5.8	0.5-2.5	.28	.28			
	52-60	25-35	1.35-1.45	0.6-2	0.18-0.20	2.6-5.8	0.0-2.0	.32	.32			
Ely	0-8	25-30	1.30-1.35	0.6-2	0.21-0.23	2.6-4.2	4.0-6.0	.28	.28	5	7	38
	8-24	25-30	1.30-1.35	0.6-2	0.21-0.23	2.6-4.2	3.0-6.0	.28	.28			
	24-32	25-30	1.30-1.35	0.6-2	0.21-0.23	2.6-4.2	2.0-4.0	.28	.28			
	32-47	28-35	1.30-1.40	0.6-2	0.18-0.20	3.5-5.8	1.0-3.0	.43	.43			
	47-58	20-30	1.40-1.45	0.6-2	0.18-0.20	1.0-4.2	0.5-2.0	.43	.43			
	58-80	20-30	1.40-1.45	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43			
933:												
Sawmill, occasionally flooded	0-10	27-35	1.20-1.40	0.6-2	0.21-0.23	3.2-5.8	5.0-7.0	.28	.28	5	7	38
	10-25	27-35	1.20-1.40	0.6-2	0.21-0.23	3.2-5.8	3.0-6.0	.28	.28			
	25-32	27-35	1.20-1.40	0.6-2	0.21-0.23	3.2-5.8	2.0-4.0	.28	.28			
	32-40	25-35	1.30-1.40	0.6-2	0.17-0.20	2.6-5.8	0.5-2.0	.28	.28			
	40-58	25-35	1.30-1.40	0.6-2	0.17-0.20	2.6-5.8	0.5-2.0	.28	.28			
	58-65	18-35	1.35-1.50	0.6-2	0.15-0.19	0.4-5.8	0.0-1.0	.28	.28			
982:												
Maxmore	0-8	25-35	1.35-1.40	0.6-2	0.21-0.23	2.6-5.8	6.0-8.0	.28	.28	5	7	38
	8-20	25-35	1.35-1.40	0.6-2	0.21-0.23	2.6-5.8	3.0-6.0	.28	.28			
	20-50	25-35	1.40-1.50	0.6-2	0.18-0.20	2.6-5.8	0.5-2.0	.32	.32			
	50-80	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.32	.32			
1152:												
Marshan, 24 to 40 inches to sand and gravel	0-10	25-35	1.30-1.40	0.6-2	0.20-0.22	2.6-5.8	5.0-6.0	.28	.28	4	6	48
	10-14	25-35	1.30-1.40	0.6-2	0.20-0.22	2.6-5.8	2.0-5.0	.28	.28			
	14-18	25-35	1.40-1.55	0.6-2	0.17-0.22	2.6-5.8	1.0-3.0	.28	.28			
	18-23	25-35	1.40-1.55	0.6-2	0.17-0.22	2.6-5.8	0.5-1.0	.28	.28			
	23-30	18-30	1.45-1.55	0.6-2	0.15-0.19	0.4-4.2	0.5-1.0	.28	.28			
	30-40	0-5	1.55-1.65	6-20	0.02-0.05	0.0-0.0	0.0-0.5	.15	.15			
	40-60	0-5	1.55-1.65	6-20	0.02-0.05	0.0-0.0	0.0-0.5	.15	.15			
1226:												
Lawler, 24 to 40 inches to sand and gravel	0-8	18-27	1.40-1.45	0.6-2	0.20-0.22	0.4-3.2	4.0-5.0	.24	.24	4	6	48
	8-15	18-27	1.40-1.45	0.6-2	0.20-0.22	0.4-3.2	2.5-4.0	.24	.24			
	15-21	18-27	1.40-1.45	0.6-2	0.20-0.22	0.4-3.2	1.5-3.0	.24	.24			
	21-32	20-28	1.45-1.60	0.6-2	0.16-0.18	1.0-3.5	0.5-2.0	.28	.28			
	32-37	20-28	1.45-1.60	0.6-2	0.16-0.18	1.0-3.5	0.5-2.0	.28	.28			
	37-60	2-8	1.60-1.75	20-101	0.02-0.04	0.0-0.0	0.0-0.5	.10	.10			
1285G:												
Burkhardt	0-10	5-13	1.35-1.55	2-6	0.11-0.15	0.0-0.0	1.0-2.0	.20	.20	2	3	86
	10-17	8-18	1.55-1.65	2-6	0.19-0.22	0.0-0.4	0.0-0.5	.24	.24			
	17-19	1-6	1.50-1.60	6-20	0.02-0.04	0.0-0.0	0.0-0.5	.10	.10			
	19-60	1-6	1.50-1.60	6-20	0.02-0.04	0.0-0.0	0.0-0.5	.10	.10			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
1285G:												
Bassett---------------	0-5	18-25	1.45-1.50	0.6-2	0.19-0.21	0.4-2.6	2.5-3.5	.28	.28	5	6	48
	5-10	18-25	1.45-1.50	0.6-2	0.19-0.21	0.4-2.6	0.5-1.0	.28	.28			
	10-14	18-25	1.45-1.50	0.6-2	0.19-0.21	0.4-2.6	0.5-1.0	.28	.28			
	14-43	20-28	1.55-1.65	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.28	.28			
	43-59	20-28	1.55-1.65	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.28	.28			
	59-73	20-24	1.65-1.75	0.6-2	0.17-0.19	1.0-2.3	0.0-0.5	.37	.37			
Chelsea---------------	0-4	8-15	1.50-1.55	6-20	0.10-0.15	0.0-0.0	0.5-1.5	.17	.17	5	2	134
	4-30	5-10	1.55-1.70	6-20	0.06-0.08	0.0-0.0	0.0-0.5	.17	.17			
	30-70	5-10	1.55-1.70	6-20	0.06-0.08	0.0-0.0	0.0-0.5	.17	.17			
1585:												
Spillville, frequently flooded--------------	0-54	18-26	1.45-1.55	0.6-2	0.19-0.21	0.4-2.9	3.0-5.0	.24	.24	5	6	48
	54-60	14-24	1.55-1.70	0.6-6	0.15-0.18	0.0-2.3	1.0-3.0	.28	.28			
Coland, frequently flooded--------------	0-32	27-35	1.40-1.50	0.6-2	0.20-0.22	3.2-5.8	3.0-6.0	.24	.24	5	6	48
	32-40	25-35	1.40-1.50	0.6-2	0.20-0.22	2.6-5.8	3.0-6.0	.24	.24			
	40-44	12-28	1.50-1.65	0.6-6	0.13-0.17	0.0-3.5	0.0-2.0	.28	.28			
	44-52	12-28	1.50-1.65	0.6-6	0.13-0.17	0.0-3.5	0.0-2.0	.28	.28			
	52-60	12-28	1.50-1.65	0.6-6	0.13-0.17	0.0-3.5	0.0-1.0	.28	.28			
Aquolls, ponded.												
1586:												
Sigglekov, frequently flooded--------------	0-9	10-15	1.50-1.55	2-6	0.12-0.15	0.0-0.0	0.5-1.5	.24	.24	5	3	86
	9-15	2-10	1.50-1.75	6-20	0.02-0.04	0.0-0.0	0.0-0.5	.15	.15			
	15-35	2-10	1.50-1.75	6-20	0.02-0.04	0.0-0.0	0.0-0.5	.15	.15			
	35-80	2-10	1.50-1.75	6-20	0.02-0.04	0.0-0.0	0.0-0.5	.15	.15			
Fluvaquents, frequently flooded.												
Aquents, ponded.												
4000.												
Urban land												
4007:												
Wiota-----------------	0-8	24-32	1.30-1.35	0.6-2	0.21-0.23	2.3-4.8	3.5-4.5	.28	.28	5	6	48
	8-22	24-32	1.30-1.35	0.6-2	0.21-0.23	2.3-4.8	1.0-3.0	.28	.28			
	22-28	30-36	1.30-1.35	0.6-2	0.18-0.20	4.2-6.1	1.0-2.0	.28	.28			
	28-48	30-36	1.30-1.40	0.6-2	0.18-0.20	4.2-6.1	0.5-1.0	.43	.43			
	48-54	25-34	1.40-1.45	0.6-2	0.18-0.20	2.6-5.4	0.0-0.5	.43	.43			
	54-80	4-10	1.55-1.65	6-20	0.08-0.10	0.0-0.0	0.0-0.5	.20	.20			
Urban land.												
4041:												
Sparta----------------	0-11	3-10	1.20-1.40	2-6	0.09-0.12	0.0-0.0	1.0-2.0	.17	.17	5	2	134
	11-15	3-10	1.20-1.40	2-6	0.09-0.12	0.0-0.0	0.5-1.0	.17	.17			
	15-34	1-8	1.40-1.60	6-20	0.05-0.11	0.0-0.0	0.0-0.5	.15	.15			
	34-60	0-5	1.50-1.70	6-20	0.04-0.07	0.0-0.0	0.0-0.5	.15	.15			
Urban land.												

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
4041B:												
Sparta----------------	0-11	3-10	1.20-1.40	2-6	0.09-0.12	0.0-0.0	1.0-2.0	.17	.17	5	2	134
	11-15	3-10	1.20-1.40	2-6	0.09-0.12	0.0-0.0	0.5-1.0	.17	.17			
	15-34	1-8	1.40-1.60	6-20	0.05-0.11	0.0-0.0	0.0-0.5	.15	.15			
	34-60	0-5	1.50-1.70	6-20	0.04-0.07	0.0-0.0	0.0-0.5	.15	.15			
Urban land.												
4041C:												
Sparta----------------	0-9	3-10	1.20-1.40	2-6	0.09-0.12	0.0-0.0	1.0-2.0	.17	.17	5	2	134
	9-14	3-10	1.20-1.40	2-6	0.09-0.12	0.0-0.0	0.5-1.0	.17	.17			
	14-32	1-8	1.40-1.60	6-20	0.05-0.11	0.0-0.0	0.0-0.5	.15	.15			
	32-60	0-5	1.50-1.70	6-20	0.04-0.07	0.0-0.0	0.0-0.5	.15	.15			
Urban land.												
4041D:												
Sparta----------------	0-9	3-10	1.20-1.40	2-6	0.09-0.12	0.0-0.0	1.0-2.0	.17	.17	5	2	134
	9-14	3-10	1.20-1.40	2-6	0.09-0.12	0.0-0.0	0.5-1.0	.17	.17			
	14-30	1-8	1.40-1.60	6-20	0.05-0.11	0.0-0.0	0.0-0.5	.15	.15			
	30-60	0-5	1.50-1.70	6-20	0.04-0.07	0.0-0.0	0.0-0.5	.15	.15			
Urban land.												
4063B:												
Chelsea---------------	0-8	8-15	1.50-1.55	6-20	0.10-0.15	0.0-0.0	0.5-1.5	.17	.17	5	2	134
	8-36	5-10	1.55-1.70	6-20	0.06-0.08	0.0-0.0	0.0-0.5	.17	.17			
	36-70	5-10	1.55-1.70	6-20	0.06-0.08	0.0-0.0	0.0-0.5	.17	.17			
Urban land.												
4063C:												
Chelsea---------------	0-8	8-15	1.50-1.55	6-20	0.10-0.15	0.0-0.0	0.5-1.5	.17	.17	5	2	134
	8-36	5-10	1.55-1.70	6-20	0.06-0.08	0.0-0.0	0.0-0.5	.17	.17			
	36-70	5-10	1.55-1.70	6-20	0.06-0.08	0.0-0.0	0.0-0.5	.17	.17			
Urban land.												
4063D:												
Chelsea---------------	0-8	8-15	1.50-1.55	6-20	0.10-0.15	0.0-0.0	0.5-1.5	.17	.17	5	2	134
	8-32	5-10	1.55-1.70	6-20	0.06-0.08	0.0-0.0	0.0-0.5	.17	.17			
	32-70	5-10	1.55-1.70	6-20	0.06-0.08	0.0-0.0	0.0-0.5	.17	.17			
Urban land.												
4083B:												
Kenyon----------------	0-8	18-26	1.40-1.45	0.6-2	0.20-0.22	0.4-2.9	3.0-4.0	.24	.24	5	6	48
	8-14	18-26	1.40-1.45	0.6-2	0.20-0.22	0.4-2.9	2.0-3.0	.24	.24			
	14-19	18-26	1.40-1.45	0.6-2	0.20-0.22	0.4-2.9	1.0-3.0	.24	.24			
	19-47	20-30	1.45-1.65	0.6-2	0.17-0.19	1.0-4.2	0.0-1.0	.28	.28			
	47-54	20-24	1.65-1.75	0.6-2	0.17-0.19	1.0-2.3	0.0-0.5	.37	.37			
	54-76	20-24	1.65-1.75	0.6-2	0.17-0.19	1.0-2.3	0.0-0.5	.37	.37			
Urban land.												
4083C:												
Kenyon----------------	0-8	18-26	1.40-1.45	0.6-2	0.20-0.22	0.4-2.9	3.0-4.0	.24	.24	5	6	48
	8-14	18-26	1.40-1.45	0.6-2	0.20-0.22	0.4-2.9	2.0-3.0	.24	.24			
	14-19	18-26	1.40-1.45	0.6-2	0.20-0.22	0.4-2.9	1.0-3.0	.24	.24			
	19-47	20-30	1.45-1.65	0.6-2	0.17-0.19	1.0-4.2	0.0-1.0	.28	.28			
	47-54	20-24	1.65-1.75	0.6-2	0.17-0.19	1.0-2.3	0.0-0.5	.37	.37			
	54-76	20-24	1.65-1.75	0.6-2	0.17-0.19	1.0-2.3	0.0-0.5	.37	.37			
Urban land.												

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
4083D:												
Kenyon----------------	0-8	18-26	1.40-1.45	0.6-2	0.20-0.22	0.4-2.9	3.0-4.0	.24	.24	5	6	48
	8-14	18-26	1.40-1.45	0.6-2	0.20-0.22	0.4-2.9	2.0-3.0	.24	.24			
	14-19	18-26	1.40-1.45	0.6-2	0.20-0.22	0.4-2.9	1.0-3.0	.24	.24			
	19-47	20-30	1.45-1.65	0.6-2	0.17-0.19	1.0-4.2	0.0-1.0	.28	.28			
	47-54	20-24	1.65-1.75	0.6-2	0.17-0.19	1.0-2.3	0.0-0.5	.37	.37			
	54-76	20-24	1.65-1.75	0.6-2	0.17-0.19	1.0-2.3	0.0-0.5	.37	.37			
Urban land.												
4084:												
Clyde-----------------	0-8	25-32	1.35-1.40	0.6-2	0.21-0.23	2.6-4.8	6.0-9.0	.28	.28	5	7	38
	8-17	28-32	1.35-1.40	0.6-2	0.21-0.23	3.5-4.8	2.0-6.0	.28	.28			
	17-23	28-32	1.35-1.40	0.6-2	0.21-0.23	3.5-4.8	1.0-4.0	.28	.28			
	23-41	22-30	1.45-1.65	0.6-2	0.18-0.20	1.6-4.2	0.5-2.0	.37	.37			
	41-44	10-15	1.60-1.70	0.6-2	0.11-0.13	0.0-0.0	0.5-1.0	.37	.37			
	44-54	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.37	.37			
	54-66	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.37	.37			
Urban land.												
4088:												
Nevin-----------------	0-8	26-29	1.30-1.35	0.6-2	0.21-0.23	2.9-3.9	4.0-6.0	.28	.28	5	7	38
	8-24	26-29	1.30-1.35	0.6-2	0.21-0.23	2.9-3.9	2.0-4.0	.28	.28			
	24-30	26-29	1.30-1.35	0.6-2	0.21-0.23	2.9-3.9	1.0-3.0	.28	.28			
	30-46	30-35	1.30-1.40	0.6-2	0.18-0.20	4.2-5.8	0.5-2.0	.32	.32			
	46-58	25-36	1.25-1.35	0.6-2	0.18-0.20	2.6-6.1	0.5-2.0	.28	.28			
	58-80	3-10	1.30-1.35	0.6-2	0.05-0.10	0.0-0.0	0.0-0.5	.15	.15			
Urban land.												
4133:												
Colo, occasionally flooded--------------	0-8	25-36	1.28-1.32	0.6-2	0.21-0.23	2.6-6.1	5.0-7.0	.28	.28	5	7	38
	8-34	25-36	1.28-1.32	0.6-2	0.21-0.23	2.6-6.1	3.0-6.0	.28	.28			
	34-40	27-36	1.28-1.32	0.6-2	0.21-0.23	3.2-6.1	2.0-4.0	.28	.28			
	40-46	30-35	1.25-1.35	0.6-2	0.18-0.20	4.2-5.8	1.0-3.0	.28	.28			
	46-52	30-35	1.25-1.35	0.6-2	0.18-0.20	4.2-5.8	0.5-2.0	.28	.28			
	52-60	25-35	1.35-1.45	0.6-2	0.18-0.20	2.6-5.8	0.0-2.0	.32	.32			
Urban land.												
4135:												
Coland, occasionally flooded--------------	0-8	27-35	1.40-1.50	0.6-2	0.20-0.22	3.2-5.8	5.0-7.0	.24	.24	5	6	48
	8-32	27-35	1.40-1.50	0.6-2	0.20-0.22	3.2-5.8	3.0-6.0	.24	.24			
	32-40	25-35	1.40-1.50	0.6-2	0.20-0.22	2.6-5.8	2.0-4.0	.24	.24			
	40-44	12-28	1.50-1.65	0.6-6	0.13-0.17	0.0-3.5	0.0-2.0	.28	.28			
	44-52	12-28	1.50-1.65	0.6-6	0.13-0.17	0.0-3.5	0.0-2.0	.28	.28			
	52-66	12-28	1.50-1.65	0.6-6	0.13-0.17	0.0-3.5	0.0-1.0	.28	.28			
Urban land.												
4152:												
Marshan, 24 to 40 inches to sand and gravel---------------	0-10	25-35	1.30-1.40	0.6-2	0.20-0.22	2.6-5.8	5.0-6.0	.28	.28	4	6	48
	10-14	25-35	1.30-1.40	0.6-2	0.20-0.22	2.6-5.8	2.0-5.0	.28	.28			
	14-18	25-35	1.40-1.55	0.6-2	0.17-0.22	2.6-5.8	1.0-3.0	.28	.28			
	18-23	25-35	1.40-1.55	0.6-2	0.17-0.22	2.6-5.8	0.5-1.0	.28	.28			
	23-30	18-30	1.45-1.55	0.6-2	0.15-0.19	0.4-4.2	0.5-1.0	.28	.28			
	30-40	0-5	1.55-1.65	6-20	0.02-0.05	0.0-0.0	0.0-0.5	.15	.15			
	40-60	0-5	1.55-1.65	6-20	0.02-0.05	0.0-0.0	0.0-0.5	.15	.15			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
4152:												
Urban land.												
4159:												
Finchford-------------	0-8	5-10	1.50-1.55	6-20	0.10-0.12	0.0-0.0	1.0-2.0	.17	.17	5	2	134
	8-18	5-10	1.50-1.55	6-20	0.10-0.12	0.0-0.0	0.5-1.0	.17	.17			
	18-30	2-8	1.50-1.60	20-101	0.04-0.06	0.0-0.0	0.0-0.5	.15	.15			
	30-55	2-5	1.60-1.70	20-101	0.02-0.04	0.0-0.0	0.0-0.5	.15	.15			
	55-70	2-5	1.60-1.70	20-101	0.02-0.04	0.0-0.0	0.0-0.5	.15	.15			
	70-80	2-5	1.60-1.70	20-101	0.02-0.04	0.0-0.0	0.0-0.5	.15	.15			
Urban land.												
4159C:												
Finchford-------------	0-8	5-10	1.50-1.55	6-20	0.10-0.12	0.0-0.0	1.0-2.0	.17	.17	5	2	134
	8-15	5-10	1.50-1.55	6-20	0.10-0.12	0.0-0.0	0.5-1.0	.17	.17			
	15-26	2-8	1.50-1.60	20-101	0.04-0.06	0.0-0.0	0.0-0.5	.15	.15			
	26-50	2-5	1.60-1.70	20-101	0.02-0.04	0.0-0.0	0.0-0.5	.15	.15			
	50-65	2-5	1.60-1.70	20-101	0.02-0.04	0.0-0.0	0.0-0.5	.15	.15			
	65-80	2-5	1.60-1.70	20-101	0.02-0.04	0.0-0.0	0.0-0.5	.15	.15			
Urban land.												
4171B:												
Bassett---------------	0-8	18-25	1.45-1.50	0.6-2	0.19-0.21	0.4-2.6	2.5-3.5	.28	.28	5	6	48
	8-10	18-25	1.45-1.50	0.6-2	0.19-0.21	0.4-2.6	0.5-1.0	.28	.28			
	10-14	18-25	1.45-1.50	0.6-2	0.19-0.21	0.4-2.6	0.5-1.0	.28	.28			
	14-43	20-28	1.55-1.65	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.28	.28			
	43-59	20-28	1.55-1.65	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.28	.28			
	59-73	20-24	1.65-1.75	0.6-2	0.17-0.19	1.0-2.3	0.0-0.5	.37	.37			
Urban land.												
4171D:												
Bassett---------------	0-8	18-25	1.45-1.50	0.6-2	0.19-0.21	0.4-2.6	2.5-3.5	.28	.28	5	6	48
	8-10	18-25	1.45-1.50	0.6-2	0.19-0.21	0.4-2.6	0.5-1.0	.28	.28			
	10-14	18-25	1.45-1.50	0.6-2	0.19-0.21	0.4-2.6	0.5-1.0	.28	.28			
	14-43	20-28	1.55-1.65	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.28	.28			
	43-59	20-28	1.55-1.65	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.28	.28			
	59-73	20-24	1.65-1.75	0.6-2	0.17-0.19	1.0-2.3	0.0-0.5	.37	.37			
Urban land.												
4175:												
Dickinson-------------	0-9	12-18	1.50-1.55	2-6	0.12-0.15	0.0-0.4	2.0-3.0	.20	.20	4	3	86
	9-18	10-18	1.45-1.55	2-6	0.12-0.15	0.0-0.4	0.5-2.5	.20	.20			
	18-30	10-18	1.45-1.55	6-20	0.12-0.15	0.0-0.4	0.0-0.5	.20	.20			
	30-36	5-10	1.55-1.65	6-20	0.08-0.10	0.0-0.0	0.0-0.5	.20	.20			
	36-60	5-10	1.60-1.70	6-20	0.02-0.04	0.0-0.0	0.0-0.5	.15	.15			
Urban land.												
4175B:												
Dickinson-------------	0-9	12-18	1.50-1.55	2-6	0.12-0.15	0.0-0.4	1.5-2.5	.20	.20	4	3	86
	9-18	10-18	1.45-1.55	2-6	0.12-0.15	0.0-0.4	0.5-2.5	.20	.20			
	18-30	10-18	1.45-1.55	6-20	0.12-0.15	0.0-0.4	0.0-0.5	.20	.20			
	30-36	5-10	1.55-1.65	6-20	0.08-0.10	0.0-0.0	0.0-0.5	.20	.20			
	36-60	5-10	1.60-1.70	6-20	0.02-0.04	0.0-0.0	0.0-0.5	.15	.15			
Urban land.												

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
4177:												
Saude-----------------	0-7	18-24	1.40-1.45	0.6-2	0.20-0.22	0.4-2.3	3.0-4.0	.24	.24	4	6	48
	7-13	18-24	1.40-1.45	0.6-2	0.20-0.22	0.4-2.3	2.0-4.0	.24	.24			
	13-16	12-18	1.40-1.50	0.6-6	0.15-0.19	0.0-0.4	1.0-3.0	.24	.24			
	16-24	12-18	1.40-1.50	0.6-6	0.15-0.19	0.0-0.4	0.5-1.0	.24	.24			
	24-28	12-18	1.40-1.50	0.6-6	0.15-0.19	0.0-0.4	0.5-1.0	.24	.24			
	28-36	2-8	1.50-1.75	20-101	0.02-0.06	0.0-0.0	0.0-0.5	.10	.20			
	36-60	2-8	1.50-1.75	20-101	0.02-0.06	0.0-0.0	0.0-0.5	.10	.20			
Urban land.												
4177B:												
Saude-----------------	0-7	18-24	1.40-1.45	0.6-2	0.20-0.22	0.4-2.3	3.0-4.0	.24	.24	4	6	48
	7-13	18-24	1.40-1.45	0.6-2	0.20-0.22	0.4-2.3	2.0-4.0	.24	.24			
	13-16	12-18	1.40-1.50	0.6-6	0.15-0.19	0.0-0.4	1.0-3.0	.24	.24			
	16-24	12-18	1.40-1.50	0.6-6	0.15-0.19	0.0-0.4	0.5-1.0	.24	.24			
	24-28	12-18	1.40-1.50	0.6-6	0.15-0.19	0.0-0.4	0.5-1.0	.24	.24			
	28-36	2-8	1.50-1.75	20-101	0.02-0.06	0.0-0.0	0.0-0.5	.10	.20			
	36-60	2-8	1.50-1.75	20-101	0.02-0.06	0.0-0.0	0.0-0.5	.10	.20			
Urban land.												
4178:												
Waukee----------------	0-8	18-24	1.40-1.45	0.6-2	0.20-0.22	0.4-2.3	3.0-4.0	.24	.24	4	6	48
	8-16	18-24	1.40-1.45	0.6-2	0.20-0.22	0.4-2.3	2.0-3.0	.24	.24			
	16-20	18-27	1.40-1.45	0.6-2	0.15-0.19	0.4-3.2	0.5-2.0	.28	.28			
	20-35	18-27	1.40-1.50	0.6-2	0.15-0.19	0.4-3.2	0.5-2.0	.28	.28			
	35-44	2-8	1.50-1.75	20-101	0.02-0.06	0.0-0.0	0.0-0.5	.10	.17			
	44-66	2-8	1.50-1.75	20-101	0.02-0.06	0.0-0.0	0.0-0.5	.10	.17			
Urban land.												
4184:												
Klinger---------------	0-9	25-30	1.30-1.35	0.6-2	0.22-0.24	2.6-4.2	5.0-6.0	.28	.28	5	7	38
	9-13	25-30	1.30-1.35	0.6-2	0.22-0.24	2.6-4.2	2.0-5.0	.28	.28			
	13-19	27-30	1.30-1.35	0.6-2	0.22-0.24	3.2-4.2	1.0-4.0	.28	.28			
	19-31	28-35	1.35-1.45	0.6-2	0.18-0.20	3.5-5.8	0.5-2.0	.43	.43			
	31-40	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.43	.43			
	40-46	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.43	.43			
	46-64	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.43	.43			
Urban land.												
4198B:												
Floyd-----------------	0-8	20-28	1.35-1.40	0.6-2	0.20-0.22	1.0-3.5	5.0-6.0	.24	.24	5	6	48
	8-24	20-28	1.35-1.40	0.6-2	0.20-0.22	1.0-3.5	2.0-5.0	.24	.24			
	24-33	18-24	1.40-1.60	0.6-2	0.16-0.18	0.4-2.3	1.0-2.0	.32	.32			
	33-41	6-24	1.35-1.40	2-6	0.11-0.13	0.0-2.3	0.5-1.0	.32	.32			
	41-50	18-30	1.40-1.65	0.6-2	0.16-0.18	0.4-4.2	0.0-1.0	.32	.32			
	50-60	18-30	1.65-1.80	0.6-2	0.16-0.18	0.4-4.2	0.0-0.5	.32	.32			
Urban land.												
4226:												
Lawler, 24 to 40 inches to sand and gravel---------------	0-8	18-27	1.40-1.45	0.6-2	0.20-0.22	0.4-3.2	4.0-5.0	.24	.24	4	6	48
	8-15	18-27	1.40-1.45	0.6-2	0.20-0.22	0.4-3.2	2.5-4.0	.24	.24			
	15-21	18-27	1.40-1.45	0.6-2	0.20-0.22	0.4-3.2	1.5-3.0	.24	.24			
	21-32	20-28	1.45-1.60	0.6-2	0.16-0.18	1.0-3.5	0.5-2.0	.28	.28			
	32-37	20-28	1.45-1.60	0.6-2	0.16-0.18	1.0-3.5	0.5-2.0	.28	.28			
	37-60	2-8	1.60-1.75	20-101	0.02-0.04	0.0-0.0	0.0-0.5	.10	.10			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
4226:												
Urban land.												
4284:												
Flagler	0-8	12-18	1.50-1.55	2-6	0.12-0.14	0.0-0.4	1.5-2.5	.20	.20	4	3	86
	8-15	12-18	1.50-1.55	2-6	0.12-0.14	0.0-0.4	1.0-2.5	.20	.20			
	15-22	12-18	1.50-1.55	2-6	0.12-0.14	0.0-0.4	1.0-2.5	.20	.20			
	22-33	10-15	1.55-1.60	2-6	0.11-0.13	0.0-0.0	0.0-1.0	.20	.20			
	33-65	2-8	1.60-1.75	20-101	0.02-0.04	0.0-0.0	0.0-0.5	.20	.20			
Urban land.												
4284B:												
Flagler	0-8	12-18	1.50-1.55	2-6	0.12-0.14	0.0-0.4	1.5-2.5	.20	.20	4	3	86
	8-15	12-18	1.50-1.55	2-6	0.12-0.14	0.0-0.4	1.0-2.5	.20	.20			
	15-22	12-18	1.50-1.55	2-6	0.12-0.14	0.0-0.4	1.0-2.5	.20	.20			
	22-33	10-15	1.55-1.60	2-6	0.11-0.13	0.0-0.0	0.0-1.0	.20	.20			
	33-65	2-8	1.60-1.75	20-101	0.02-0.04	0.0-0.0	0.0-0.5	.20	.20			
Urban land.												
4377B:												
Dinsdale	0-7	25-29	1.25-1.30	0.6-2	0.21-0.23	2.6-3.9	3.0-4.0	.28	.28	5	7	38
	7-15	25-29	1.25-1.30	0.6-2	0.21-0.23	2.6-3.9	2.0-3.0	.28	.28			
	15-21	30-34	1.30-1.35	0.6-2	0.18-0.20	4.2-5.4	1.0-2.0	.28	.28			
	21-36	30-34	1.30-1.35	0.6-2	0.18-0.20	4.2-5.4	0.5-2.0	.43	.43			
	36-50	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.43	.43			
	50-80	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.43	.43			
Urban land.												
4377C:												
Dinsdale	0-7	25-29	1.25-1.30	0.6-2	0.21-0.23	2.6-3.9	3.0-4.0	.28	.28	5	7	38
	7-15	25-29	1.25-1.30	0.6-2	0.21-0.23	2.6-3.9	2.0-3.0	.28	.28			
	15-21	30-34	1.30-1.35	0.6-2	0.18-0.20	4.2-4.8	1.0-2.0	.28	.28			
	21-36	30-34	1.30-1.35	0.6-2	0.18-0.20	4.2-4.8	0.5-2.0	.43	.43			
	36-50	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-2.3	0.0-0.5	.43	.43			
	50-80	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-2.3	0.0-0.5	.43	.43			
Urban land.												
4382:												
Maxfield	0-7	27-35	1.35-1.40	0.6-2	0.21-0.23	3.2-5.8	6.0-8.0	.28	.28	5	7	38
	7-17	27-35	1.35-1.40	0.6-2	0.21-0.23	3.2-5.8	3.0-6.0	.28	.28			
	17-23	25-34	1.40-1.50	0.6-2	0.18-0.20	2.6-5.4	0.5-2.0	.32	.32			
	23-32	25-34	1.40-1.50	0.6-2	0.18-0.20	2.6-5.4	0.5-2.0	.32	.32			
	32-45	20-26	1.65-1.75	0.6-2	0.17-0.19	1.0-2.9	0.0-0.5	.32	.32			
	45-66	20-26	1.65-1.75	0.6-2	0.17-0.19	1.0-2.9	0.0-0.5	.32	.32			
Urban land.												
4391B:												
Clyde	0-8	25-32	1.35-1.40	0.6-2	0.21-0.23	2.6-4.8	6.0-9.0	.28	.28	5	7	48
	8-17	28-32	1.35-1.40	0.6-2	0.21-0.23	3.5-4.8	2.0-6.0	.28	.28			
	17-23	28-32	1.35-1.40	0.6-2	0.21-0.23	3.5-4.8	1.0-4.0	.28	.28			
	23-41	22-30	1.45-1.65	0.6-2	0.18-0.20	1.6-4.2	0.5-2.0	.37	.37			
	41-44	10-15	1.60-1.70	0.6-2	0.11-0.13	0.0-0.0	0.5-1.0	.37	.37			
	44-54	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.37	.37			
	54-66	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.37	.37			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
4391B:												
Floyd-----------------	0-8	20-28	1.35-1.40	0.6-2	0.20-0.22	1.0-3.5	5.0-6.0	.24	.24	5	7	48
	8-24	20-28	1.35-1.40	0.6-2	0.20-0.22	1.0-3.5	2.0-5.0	.24	.24			
	24-33	18-24	1.40-1.60	0.6-2	0.16-0.18	0.4-2.3	1.0-2.0	.32	.32			
	33-41	6-24	1.35-1.40	2-6	0.11-0.13	0.0-2.3	0.5-1.0	.32	.32			
	41-50	18-30	1.40-1.65	0.6-2	0.16-0.18	0.4-4.2	0.0-1.0	.32	.32			
	50-60	18-30	1.65-1.80	0.6-2	0.16-0.18	0.4-4.2	0.0-0.5	.32	.32			
Urban land.												
4398:												
Tripoli---------------	0-9	28-32	1.40-1.45	0.6-2	0.19-0.21	3.5-4.8	6.0-7.0	.24	.24	5	6	48
	9-18	28-32	1.40-1.45	0.6-2	0.19-0.21	3.5-4.8	4.0-6.0	.24	.24			
	18-24	22-28	1.45-1.70	0.6-2	0.17-0.19	1.6-3.5	0.5-2.0	.24	.24			
	24-38	22-28	1.45-1.70	0.6-2	0.17-0.19	1.6-3.5	0.0-1.0	.28	.28			
	38-66	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.28	.28			
Urban land.												
4399:												
Readlyn---------------	0-7	18-28	1.35-1.40	0.6-2	0.20-0.22	0.4-3.5	4.5-5.5	.24	.24	5	6	48
	7-17	18-28	1.35-1.40	0.6-2	0.20-0.22	0.4-3.5	3.0-4.5	.24	.24			
	17-43	22-28	1.45-1.70	0.6-2	0.17-0.19	1.6-3.5	0.0-1.0	.32	.32			
	43-52	18-24	1.70-1.80	0.6-2	0.17-0.19	0.4-2.3	0.0-0.5	.32	.32			
	52-60	18-24	1.70-1.80	0.6-2	0.17-0.19	0.4-2.3	0.0-0.5	.32	.32			
Urban land.												
4408B:												
Olin------------------	0-7	12-18	1.45-1.50	2-6	0.13-0.15	0.0-0.4	1.5-2.5	.20	.20	5	3	86
	7-23	12-18	1.45-1.50	2-6	0.13-0.15	0.0-0.4	1.0-2.0	.20	.20			
	23-31	12-18	1.45-1.50	2-6	0.13-0.15	0.0-0.4	0.0-1.0	.20	.20			
	31-52	20-28	1.50-1.70	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.37	.37			
	52-80	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.37	.37			
Urban land.												
4408C:												
Olin------------------	0-7	12-18	1.45-1.50	2-6	0.13-0.15	0.0-0.4	1.5-2.5	.20	.20	5	3	86
	7-23	12-18	1.45-1.50	2-6	0.13-0.15	0.0-0.4	1.0-2.0	.20	.20			
	23-31	12-18	1.45-1.50	2-6	0.13-0.15	0.0-0.4	0.0-1.0	.20	.20			
	31-52	20-28	1.50-1.70	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.37	.37			
	52-80	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.37	.37			
Urban land.												
4426B:												
Aredale---------------	0-7	18-26	1.40-1.45	0.6-2	0.20-0.22	0.4-2.9	3.0-4.0	.24	.24	5	6	48
	7-19	18-26	1.40-1.45	0.6-2	0.20-0.22	0.4-2.9	2.0-3.0	.24	.24			
	19-33	18-28	1.45-1.65	0.6-2	0.17-0.19	0.4-3.5	0.5-1.0	.32	.32			
	33-55	8-15	1.60-1.70	2-6	0.11-0.13	0.0-0.0	0.0-0.5	.20	.20			
	55-70	18-24	1.70-1.80	0.2-0.6	0.17-0.19	0.4-2.3	0.0-0.5	.37	.37			
Urban land.												
4426C:												
Aredale---------------	0-7	18-26	1.40-1.45	0.6-2	0.20-0.22	0.4-2.9	3.0-4.0	.24	.24	5	6	48
	7-19	18-26	1.40-1.45	0.6-2	0.20-0.22	0.4-2.9	2.0-3.0	.24	.24			
	19-33	18-28	1.45-1.65	0.6-2	0.17-0.19	0.4-3.5	0.5-1.0	.32	.32			
	33-55	8-15	1.60-1.70	2-6	0.11-0.13	0.0-0.0	0.0-0.5	.20	.20			
	55-70	18-24	1.70-1.80	0.2-0.6	0.17-0.19	0.4-2.3	0.0-0.5	.37	.37			
Urban land.												

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
4585:												
Spillville, occasionally flooded	0-8	18-26	1.45-1.55	0.6-2	0.19-0.21	0.4-2.9	4.0-5.0	.24	.24	5	6	48
	8-54	18-26	1.45-1.55	0.6-2	0.19-0.21	0.4-2.9	1.0-4.0	.24	.24			
	54-60	14-24	1.55-1.70	0.6-6	0.15-0.18	0.0-2.3	1.0-2.0	.28	.28			
Coland, occasionally flooded--------------	0-8	27-35	1.40-1.50	0.6-2	0.20-0.22	3.2-5.8	5.0-7.0	.24	.24	5	6	48
	8-32	27-35	1.40-1.50	0.6-2	0.20-0.22	3.2-5.8	3.0-6.0	.24	.24			
	32-40	25-35	1.40-1.50	0.6-2	0.20-0.22	2.6-5.8	1.0-4.0	.24	.24			
	40-44	12-28	1.50-1.65	0.6-6	0.13-0.17	0.0-3.5	0.0-2.0	.28	.28			
	44-52	12-28	1.50-1.65	0.6-6	0.13-0.17	0.0-3.5	0.0-2.0	.28	.28			
	52-60	12-28	1.50-1.65	0.6-6	0.13-0.17	0.0-3.5	0.0-1.0	.28	.28			
Urban land.												
4761:												
Franklin--------------	0-6	18-25	1.30-1.35	0.6-2	0.21-0.23	0.4-2.6	3.0-4.0	.28	.28	5	6	48
	6-13	18-25	1.30-1.35	0.6-2	0.21-0.23	0.4-2.6	0.5-1.0	.28	.28			
	13-18	30-34	1.35-1.40	0.6-2	0.18-0.20	4.2-5.4	0.5-1.0	.37	.37			
	18-28	30-34	1.35-1.40	0.6-2	0.18-0.20	4.2-5.4	0.0-0.5	.37	.37			
	28-37	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.37	.37			
	37-46	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.37	.37			
	46-64	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.37	.37			
	64-74	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.37	.37			
Urban land.												
4771B:												
Waubeek---------------	0-7	18-26	1.25-1.30	0.6-2	0.21-0.23	0.4-2.9	2.5-3.5	.28	.28	5	6	48
	7-13	18-26	1.25-1.30	0.6-2	0.21-0.23	0.4-2.9	0.5-1.0	.28	.28			
	13-29	25-34	1.25-1.35	0.6-2	0.18-0.20	2.6-5.4	0.5-1.0	.37	.37			
	29-34	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.37	.37			
	34-45	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.37	.37			
	45-67	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.37	.37			
Urban land.												
4771D:												
Waubeek---------------	0-7	18-26	1.25-1.30	0.6-2	0.21-0.23	0.4-2.9	2.5-3.5	.28	.28	5	6	48
	7-13	18-26	1.25-1.30	0.6-2	0.21-0.23	0.4-2.9	0.5-1.0	.28	.28			
	13-29	25-34	1.25-1.35	0.6-2	0.18-0.20	2.6-5.4	0.5-1.0	.37	.37			
	29-34	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.37	.37			
	34-45	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.37	.37			
	45-67	20-28	1.65-1.75	0.6-2	0.17-0.19	1.0-3.5	0.0-0.5	.37	.37			
Urban land.												
4798:												
Protivin--------------	0-8	20-27	1.45-1.50	0.6-2	0.18-0.20	1.0-3.2	6.0-7.0	.28	.28	5	6	48
	8-15	20-27	1.45-1.50	0.6-2	0.18-0.20	1.0-3.2	4.0-7.0	.28	.28			
	15-19	20-27	1.50-1.60	0.2-0.6	0.17-0.19	1.0-3.2	2.0-6.0	.37	.37			
	19-23	20-27	1.50-1.60	0.2-0.6	0.17-0.19	1.0-3.2	1.0-2.0	.37	.37			
	23-45	28-33	1.60-1.70	0.2-0.6	0.15-0.17	3.5-5.1	0.0-0.5	.37	.37			
	45-60	28-33	1.60-1.70	0.2-0.6	0.15-0.17	3.5-5.1	0.0-0.5	.37	.37			
Urban land.												

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
4911B:												
Colo------------------	0-8	25-36	1.28-1.32	0.6-2	0.21-0.23	2.6-6.1	5.0-7.0	.28	.28	5	7	38
	8-34	25-36	1.28-1.32	0.6-2	0.21-0.23	2.6-6.1	3.0-6.0	.28	.28			
	34-40	27-36	1.28-1.32	0.6-2	0.21-0.23	3.2-6.1	2.0-4.0	.28	.28			
	40-46	30-35	1.25-1.35	0.6-2	0.18-0.20	4.2-5.8	1.0-3.0	.28	.28			
	46-52	30-35	1.25-1.35	0.6-2	0.18-0.20	4.2-5.8	0.5-2.5	.28	.28			
	52-60	25-35	1.35-1.45	0.6-2	0.18-0.20	2.6-5.8	0.0-2.0	.32	.32			
Ely-------------------	0-8	25-30	1.30-1.35	0.6-2	0.21-0.23	2.6-4.2	4.0-6.0	.28	.28	5	7	38
	8-24	25-30	1.30-1.35	0.6-2	0.21-0.23	2.6-4.2	3.0-6.0	.28	.28			
	24-32	25-30	1.30-1.35	0.6-2	0.21-0.23	2.6-4.2	2.0-4.0	.28	.28			
	32-47	28-35	1.30-1.40	0.6-2	0.18-0.20	3.5-5.8	1.0-3.0	.43	.43			
	47-58	20-30	1.40-1.45	0.6-2	0.18-0.20	1.0-4.2	0.5-2.0	.43	.43			
	58-80	20-30	1.40-1.45	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43			
Urban land.												
4933:												
Sawmill, occasionally flooded--------------	0-10	27-35	1.20-1.40	0.6-2	0.21-0.23	3.2-5.8	5.0-7.0	.28	.28	5	7	38
	10-25	27-35	1.20-1.40	0.6-2	0.21-0.23	3.2-5.8	3.0-6.0	.28	.28			
	25-32	27-35	1.20-1.40	0.6-2	0.21-0.23	3.2-5.8	2.0-4.0	.28	.28			
	32-40	25-35	1.30-1.40	0.6-2	0.17-0.20	2.6-5.8	0.5-2.0	.28	.28			
	40-58	25-35	1.30-1.40	0.6-2	0.17-0.20	2.6-5.8	0.5-2.0	.28	.28			
	58-65	18-35	1.35-1.50	0.6-2	0.15-0.19	0.4-5.8	0.0-1.0	.28	.28			
Urban land.												
4946:												
Orthents, loamy.												
Urban land.												
5010.												
Pits, sand and gravel												
5030.												
Pits, limestone quarries												
5040.												
Orthents, loamy												
5053.												
Psammaquents, frequently flooded												
5080.												
Orthents, sanitary landfill												
AW.												
Animal waste												
SL.												
Sewage lagoon												
W.												
Water												

Table 20.--Chemical Properties of the Soils

(Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction	Calcium carbon-ate	Salinity
	In	meq/100 g	meq/100 g	pH	Pct	mmhos/cm
7:						
Wiota----------------	0-8	20-25	---	5.6-7.3	0	---
	8-22	20-25	---	5.6-7.3	0	---
	22-28	20-25	---	5.6-7.3	0	---
	28-48	20-25	---	5.6-6.5	0	---
	48-54	20-25	---	6.1-6.5	0	---
	54-80	5.0-10	---	5.1-6.5	0	---
41:						
Sparta---------------	0-11	10-15	---	5.1-7.3	0	---
	11-15	10-15	---	5.1-7.3	0	---
	15-34	1.0-6.0	---	5.1-6.5	0	---
	34-60	1.0-4.0	---	5.1-6.0	0	---
41B:						
Sparta---------------	0-11	10-15	---	5.1-7.3	0	---
	11-15	10-15	---	5.1-7.3	0	---
	15-34	1.0-6.0	---	5.1-6.5	0	---
	34-60	1.0-4.0	---	5.1-6.0	0	---
41C:						
Sparta---------------	0-9	10-15	---	5.1-7.3	0	---
	9-14	10-15	---	5.1-7.3	0	---
	14-32	1.0-6.0	---	5.1-6.5	0	---
	32-60	1.0-4.0	---	5.1-6.0	0	---
41D:						
Sparta---------------	0-9	10-15	---	5.1-7.3	0	---
	9-14	10-15	---	5.1-7.3	0	---
	14-30	1.0-6.0	---	5.1-6.5	0	---
	30-60	1.0-4.0	---	5.1-6.0	0	---
63B:						
Chelsea--------------	0-8	5.0-10	---	5.6-7.3	0	---
	8-36	5.0-10	---	5.1-6.5	0	---
	36-70	5.0-10	---	5.1-6.5	0	---
63C:						
Chelsea--------------	0-8	5.0-10	---	5.6-7.3	0	---
	8-36	5.0-10	---	5.1-6.5	0	---
	36-70	5.0-10	---	5.1-6.5	0	---
63D:						
Chelsea--------------	0-8	5.0-10	---	5.6-7.3	0	---
	8-32	5.0-10	---	5.1-6.5	0	---
	32-70	5.0-10	---	5.1-6.5	0	---
83B:						
Kenyon---------------	0-8	20-25	---	5.6-7.3	0	---
	8-14	20-25	---	5.6-7.3	0	---
	14-19	20-25	---	5.6-7.3	0	---
	19-47	20-25	---	5.1-7.3	0-25	---
	47-54	20-25	---	6.6-8.4	0-25	---
	54-76	20-25	---	6.6-8.4	0-25	---

Table 20.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction	Calcium carbon-ate	Salinity
	In	meq/100 g	meq/100 g	pH	Pct	mmhos/cm
83C:						
Kenyon---------------	0-8	20-25	---	5.6-7.3	0	---
	8-14	20-25	---	5.6-7.3	0	---
	14-19	20-25	---	5.6-7.3	0	---
	19-47	20-25	---	5.1-7.3	0-25	---
	47-54	20-25	---	6.6-8.4	0-25	---
	54-76	20-25	---	6.6-8.4	0-25	---
83C2:						
Kenyon, moderately eroded--------------	0-8	20-25	---	5.6-7.3	0	---
	8-14	20-25	---	5.6-7.3	0	---
	14-40	20-25	---	5.1-7.3	0-25	---
	40-46	20-25	---	6.6-8.4	0-25	---
	46-76	20-25	---	6.6-8.4	0-25	---
83D2:						
Kenyon, moderately eroded--------------	0-8	20-25	---	5.6-7.3	0	---
	8-14	20-25	---	5.6-7.3	0	---
	14-40	20-25	---	5.1-7.3	0-25	---
	40-46	20-25	---	6.6-8.4	0-25	---
	46-76	20-25	---	6.6-8.4	0-25	---
84:						
Clyde----------------	0-8	36-41	---	6.6-7.3	0	---
	8-17	36-41	---	6.6-7.3	0	---
	17-23	36-41	---	6.6-7.3	0	---
	23-41	30-36	---	6.1-7.3	0	---
	41-44	20-25	---	6.1-7.3	0	---
	44-54	20-25	---	6.6-8.4	0-25	---
	54-66	20-25	---	6.6-8.4	0-25	---
88:						
Nevin----------------	0-8	30-36	---	5.6-7.3	0	---
	8-24	30-36	---	5.6-7.3	0	---
	24-30	30-36	---	5.6-7.3	0	---
	30-46	30-36	---	6.1-6.5	0	---
	46-58	30-36	---	6.1-6.5	0	---
	58-80	25-30	---	5.6-6.0	0	---
133:						
Colo, occasionally flooded-------------	0-8	36-41	---	5.6-7.3	0	---
	8-34	36-41	---	5.6-7.3	0	---
	34-40	36-41	---	5.6-7.3	0	---
	40-46	36-41	---	5.6-7.3	0	---
	46-52	36-41	---	5.6-7.3	0	---
	52-60	30-36	---	6.1-7.3	0	---
135:						
Coland, occasionally flooded-------------	0-8	30-36	---	6.1-7.3	0	---
	8-32	30-36	---	6.1-7.3	0	---
	32-40	30-36	---	6.1-7.3	0	---
	40-44	20-30	---	6.1-7.8	0-20	---
	44-52	20-30	---	6.1-7.8	0-20	---
	52-66	20-30	---	6.1-7.8	0-20	---

Table 20.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction	Calcium carbon-ate	Salinity
	In	meq/100 g	meq/100 g	pH	Pct	mmhos/cm
159:						
Finchford	0-8	10-15	---	6.1-7.3	0	---
	8-18	10-15	---	6.1-7.3	0	---
	18-30	5.0-10	---	5.1-6.0	0	---
	30-55	5.0-10	---	5.6-6.5	0	---
	55-70	5.0-10	---	5.6-6.5	0	---
	70-80	5.0-10	---	5.6-6.5	0	---
159C:						
Finchford	0-8	10-15	---	6.1-7.3	0	---
	8-15	10-15	---	6.1-7.3	0	---
	15-26	5.0-10	---	5.1-6.0	0	---
	26-50	5.0-10	---	5.6-6.5	0	---
	50-65	5.0-10	---	5.6-6.5	0	---
	65-80	5.0-10	---	5.6-6.5	0	---
171B:						
Bassett	0-8	20-25	---	5.1-7.3	0	---
	8-10	20-25	---	5.1-7.3	0	---
	10-14	20-25	---	5.1-7.3	0	---
	14-43	20-25	---	4.5-7.3	0-25	---
	43-59	20-25	---	4.5-7.3	0-25	---
	59-73	20-25	---	5.1-8.4	0-25	---
175:						
Dickinson	0-9	15-20	---	5.6-7.3	0	---
	9-18	15-20	---	5.1-6.5	0	---
	18-30	5.0-10	---	5.1-6.5	0	---
	30-36	5.0-10	---	5.1-6.5	0	---
	36-60	5.0-10	---	5.6-6.5	0	---
175B:						
Dickinson	0-9	15-20	---	5.6-7.3	0	---
	9-18	15-20	---	5.1-6.5	0	---
	18-30	5.0-10	---	5.1-6.5	0	---
	30-36	5.0-10	---	5.1-6.5	0	---
	36-60	5.0-10	---	5.6-6.5	0	---
177:						
Saude	0-7	20-25	---	5.6-7.3	0	---
	7-13	20-25	---	5.6-7.3	0	---
	13-16	15-20	---	5.1-6.0	0	---
	16-24	15-20	---	5.1-6.0	0	---
	24-28	15-20	---	5.1-6.0	0	---
	28-36	5.0-10	---	5.1-6.5	0	---
	36-60	5.0-10	---	5.1-6.5	0	---
177B:						
Saude	0-7	20-25	---	5.6-7.3	0	---
	7-13	20-25	---	5.6-7.3	0	---
	13-16	15-20	---	5.1-6.0	0	---
	16-24	15-20	---	5.1-6.0	0	---
	24-28	15-20	---	5.1-6.0	0	---
	28-36	5.0-10	---	5.1-6.5	0	---
	36-60	5.0-10	---	5.1-6.5	0	---

Table 20.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction	Calcium carbon-ate	Salinity
	In	meq/100 g	meq/100 g	pH	Pct	mmhos/cm
178:						
Waukee	0-8	20-25	---	5.6-6.5	0	---
	8-16	20-25	---	5.6-6.5	0	---
	16-20	20-25	---	5.1-6.0	0	---
	20-35	20-25	---	5.1-6.0	0	---
	35-44	5.0-10	---	5.6-6.5	0	---
	44-66	5.0-10	---	5.6-6.5	0	---
178B:						
Waukee	0-8	20-25	---	5.6-6.5	0	---
	8-16	20-25	---	5.6-6.5	0	---
	16-20	20-25	---	5.1-6.0	0	---
	20-35	20-25	---	5.1-6.0	0	---
	35-44	5.0-10	---	5.6-6.5	0	---
	44-66	5.0-10	---	5.6-6.5	0	---
184:						
Klinger	0-9	30-36	---	5.1-7.3	0	---
	9-13	30-36	---	5.1-7.3	0	---
	13-19	30-36	---	5.1-7.3	0	---
	19-31	25-30	---	5.1-6.5	0	---
	31-40	15-20	---	5.1-7.8	0-25	---
	40-46	15-20	---	5.1-7.8	0-25	---
	46-64	15-20	---	5.1-7.8	0-25	---
198B:						
Floyd	0-8	25-30	---	6.1-7.3	0	---
	8-24	25-30	---	6.1-7.3	0	---
	24-33	25-30	---	6.1-7.3	0	---
	33-41	5.0-10	---	6.6-7.3	0	---
	41-50	25-30	---	6.6-8.4	0-25	---
	50-60	25-30	---	6.6-8.4	0-25	---
213B:						
Rockton, 30 to 40 inches to limestone	0-10	20-25	---	5.1-6.5	0	---
	10-15	20-25	---	5.1-6.5	0	---
	15-21	20-25	---	5.1-6.5	0	---
	21-30	20-25	---	5.1-6.5	0	---
	30-35	30-36	---	5.6-7.3	0	---
	35-80	---	---	---	---	---
221:						
Klossner	0-10	150-200	---	5.1-7.4	0	0.0-2.0
	10-26	150-200	---	5.1-7.4	0	0.0-2.0
	26-36	10-25	---	5.6-7.4	0	---
	36-48	10-25	---	5.6-7.4	0	---
	48-65	2.0-14	---	6.1-7.4	0-20	---
	65-80	2.0-14	---	6.1-7.4	0-20	---
284:						
Flagler	0-8	15-20	---	5.6-7.3	0	---
	8-15	15-20	---	5.6-7.3	0	---
	15-22	15-20	---	5.6-7.3	0	---
	22-33	10-15	---	5.1-6.5	0	---
	33-65	5.0-10	---	5.1-7.3	0	---

Table 20.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction	Calcium carbon-ate	Salinity
	In	meq/100 g	meq/100 g	pH	Pct	mmhos/cm
284B:						
Flagler---------------	0-8	15-20	---	5.6-7.3	0	---
	8-15	15-20	---	5.6-7.3	0	---
	15-22	15-20	---	5.6-7.3	0	---
	22-33	10-15	---	5.1-6.5	0	---
	33-65	5.0-10	---	5.1-7.3	0	---
290:						
Dells-----------------	0-7	20-25	---	5.6-7.3	0	---
	7-16	4.0-25	---	5.6-7.3	0	---
	16-28	0.0-7.0	---	5.1-7.3	0	---
	28-33	0.0-7.0	---	5.1-7.3	0	---
	33-60	0.0-7.0	---	5.1-7.3	0	---
354.						
Aquolls, ponded						
377B:						
Dinsdale--------------	0-7	25-30	---	5.1-7.3	0	---
	7-15	25-30	---	5.1-7.3	0	---
	15-21	25-30	---	5.1-7.3	0	---
	21-36	25-30	---	5.1-7.3	0	---
	36-50	25-30	---	5.6-8.4	0-25	---
	50-80	25-30	---	5.6-8.4	0-25	---
377C:						
Dinsdale--------------	0-7	25-30	---	5.1-7.3	0	---
	7-15	25-30	---	5.1-7.3	0	---
	15-21	25-30	---	5.1-7.3	0	---
	21-36	25-30	---	5.1-7.3	0	---
	36-50	25-30	---	5.6-8.4	0-25	---
	50-80	25-30	---	5.6-8.4	0-25	---
377C2:						
Dinsdale, moderately eroded--------------	0-8	25-30	---	5.1-7.3	0	---
	8-25	25-30	---	5.1-7.3	0	---
	25-40	25-30	---	5.6-8.4	0-25	---
	40-80	25-30	---	5.6-8.4	0-25	---
382:						
Maxfield--------------	0-7	36-41	---	6.6-7.3	0	---
	7-17	36-41	---	6.6-7.3	0	---
	17-23	30-36	---	6.1-7.3	0	---
	23-32	30-36	---	6.1-7.3	0	---
	32-45	25-30	---	6.1-7.8	0-25	---
	45-66	25-30	---	6.1-7.8	0-25	---
391B:						
Clyde-----------------	0-8	36-41	---	6.6-7.3	0	---
	8-17	36-41	---	6.6-7.3	0	---
	17-23	36-41	---	6.6-7.3	0	---
	23-41	30-36	---	6.1-7.3	0	---
	41-44	20-25	---	6.1-7.3	0	---
	44-54	20-25	---	6.6-8.4	0-25	---
	54-66	20-25	---	6.6-8.4	0-25	---

Table 20.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction	Calcium carbon-ate	Salinity
	In	meq/100 g	meq/100 g	pH	Pct	mmhos/cm
391B:						
Floyd----------------	0-8	25-30	---	6.1-7.3	0	---
	8-24	25-30	---	6.1-7.3	0	---
	24-33	25-30	---	6.1-7.3	0	---
	33-41	5.0-10	---	6.6-7.3	0	---
	41-50	25-30	---	6.6-8.4	0-25	---
	50-60	25-30	---	6.6-8.4	0-25	---
395B:						
Marquis--------------	0-8	20-25	---	5.6-7.3	0	---
	8-19	20-25	---	5.6-7.3	0	---
	19-24	20-25	---	5.1-7.3	0	---
	24-54	20-25	---	6.6-8.4	0-25	---
	54-80	20-25	---	6.6-8.4	0-25	---
398:						
Tripoli--------------	0-9	36-41	---	6.6-7.3	0	---
	9-18	36-41	---	6.6-7.3	0	---
	18-24	30-36	---	6.6-7.8	0	---
	24-38	30-36	---	6.6-7.8	0-25	---
	38-66	25-30	---	7.4-8.4	0-25	---
399:						
Readlyn--------------	0-7	25-30	---	5.1-7.3	0	---
	7-17	25-30	---	5.1-7.3	0	---
	17-43	25-30	---	5.1-6.5	0-25	---
	43-52	25-30	---	6.6-8.4	0-25	---
	52-60	25-30	---	6.6-8.4	0-25	---
408B:						
Olin-----------------	0-7	15-20	---	5.6-7.3	0	---
	7-23	15-20	---	5.6-7.3	0	---
	23-31	15-20	---	5.6-7.3	0	---
	31-52	15-20	---	5.1-6.0	0-25	---
	52-80	15-20	---	6.1-8.4	0-25	---
408C:						
Olin-----------------	0-7	15-20	---	5.6-7.3	0	---
	7-23	15-20	---	5.6-7.3	0	---
	23-31	15-20	---	5.6-7.3	0	---
	31-52	15-20	---	5.1-6.0	0-25	---
	52-80	15-20	---	6.1-8.4	0-25	---
412C:						
Emeline--------------	0-9	20-25	---	6.1-8.4	0-25	---
	9-80	---	---	---	---	---
426B:						
Aredale--------------	0-7	20-25	---	5.6-7.3	0	---
	7-19	20-25	---	5.6-7.3	0	---
	19-33	20-25	---	5.1-6.0	0	---
	33-55	20-25	---	5.1-6.0	0	---
	55-70	20-25	---	5.6-7.3	0-25	---
426C:						
Aredale--------------	0-7	20-25	---	5.6-7.3	0	---
	7-19	20-25	---	5.6-7.3	0	---
	19-33	20-25	---	5.1-6.0	0	---
	33-55	20-25	---	5.1-6.0	0	---
	55-70	20-25	---	5.6-7.3	0-25	---

Table 20.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction	Calcium carbon-ate	Salinity
	In	meq/100 g	meq/100 g	pH	Pct	mmhos/cm
426C2:						
Aredale, moderately eroded	0-8	20-25	---	5.6-7.3	0	---
	8-32	20-25	---	5.1-6.0	0	---
	32-50	20-25	---	5.1-6.0	0	---
	50-70	20-25	---	5.6-7.3	0-25	---
468B:						
Dunkerton	0-9	15-20	---	5.6-7.3	0	---
	9-15	15-20	---	5.6-7.3	0	---
	15-25	15-20	---	5.1-7.3	0	---
	25-49	15-20	---	6.1-8.4	0-25	---
	49-80	15-20	---	6.1-8.4	0-25	---
468C:						
Dunkerton	0-9	15-20	---	5.6-7.3	0	---
	9-15	15-20	---	5.6-7.3	0	---
	15-25	15-20	---	5.1-7.3	0	---
	25-49	15-20	---	6.1-8.4	0-25	---
	49-80	15-20	---	6.1-8.4	0-25	---
471:						
Oran	0-8	20-25	---	5.1-7.3	0	---
	8-14	20-25	---	5.1-7.3	0	---
	14-19	20-25	---	5.1-7.3	0	---
	19-42	20-25	---	5.1-6.5	0-25	---
	42-80	20-25	---	7.4-7.8	0-25	---
485:						
Spillville, occasionally flooded	0-8	20-25	---	5.6-7.3	0	---
	8-54	20-25	---	5.6-7.3	0	---
	54-60	20-25	---	5.6-7.3	0	---
585:						
Spillville, occasionally flooded	0-8	20-25	---	5.6-7.3	0	---
	8-54	20-25	---	5.6-7.3	0	---
	54-60	20-25	---	5.6-7.3	0	---
Coland, occasionally flooded	0-8	30-36	---	6.1-7.3	0	---
	8-32	30-36	---	6.1-7.3	0	---
	32-40	30-36	---	6.1-7.3	0	---
	40-44	20-30	---	6.1-7.8	0-20	---
	44-52	20-30	---	6.1-7.8	0-20	---
	52-60	20-30	---	6.1-7.8	0-20	---
626:						
Hayfield, 24 to 40 inches to sand and gravel	0-8	20-25	---	5.6-7.3	0	---
	8-13	15-20	---	5.6-7.3	0	---
	13-29	15-20	---	5.1-6.0	0	---
	29-80	5.0-10	---	5.6-7.8	0	---

Table 20.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction	Calcium carbon-ate	Salinity
	In	meq/100 g	meq/100 g	pH	Pct	mmhos/cm
761:						
Franklin	0-6	20-25	---	5.1-7.3	0	---
	6-13	20-25	---	5.1-7.3	0	---
	13-18	20-25	---	5.1-6.0	0	---
	18-28	20-25	---	5.1-6.0	0	---
	28-37	20-25	---	5.1-8.4	0-25	---
	37-46	20-25	---	5.1-8.4	0-25	---
	46-64	20-25	---	5.1-8.4	0-25	---
	64-74	20-25	---	5.1-8.4	0-25	---
771B:						
Waubeek	0-7	20-25	---	5.6-7.3	0	---
	7-13	20-25	---	5.6-7.3	0	---
	13-29	20-25	---	5.1-6.0	0	---
	29-34	20-25	---	5.1-7.3	0-25	---
	34-45	20-25	---	5.1-7.3	0-25	---
	45-67	20-25	---	5.1-7.3	0-25	---
775B:						
Billett	0-8	15-20	---	5.1-7.3	0	---
	8-13	4.0-13	---	5.1-6.5	0	---
	13-28	2.0-12	---	5.1-6.5	0	---
	28-41	2.0-12	---	5.6-7.3	0	---
	41-47	2.0-12	---	5.6-7.3	0	---
	47-52	1.0-7.0	---	5.1-7.8	0-20	---
	52-60	1.0-7.0	---	5.1-7.8	0-20	---
776C:						
Lilah	0-6	10-15	---	5.1-6.0	0	---
	6-15	10-15	10-15	5.1-6.0	0	---
	15-28	5.0-10	5.0-10	5.1-6.0	0	---
	28-39	5.0-10	5.0-10	5.1-6.0	0	---
	39-60	5.0-10	5.0-10	5.1-6.0	0	---
777:						
Wapsie	0-8	20-25	---	5.6-7.3	0	---
	8-13	15-20	---	5.6-7.3	0	---
	13-17	5.0-10	---	5.6-6.0	0	---
	17-27	5.0-10	---	5.6-6.0	0	---
	27-29	5.0-10	---	5.6-6.0	0	---
	29-38	5.0-10	---	5.1-7.3	0	---
	38-60	5.0-10	---	5.1-7.3	0	---
781B:						
Lourdes	0-8	20-25	---	5.6-7.3	0	---
	8-11	20-25	20-25	4.5-5.5	0	---
	11-15	20-25	20-25	4.5-5.5	0	---
	15-44	20-25	---	4.5-6.5	0-25	---
	44-51	20-25	---	7.4-7.8	0-25	---
	51-76	20-25	---	7.4-7.8	0-25	---
781C2:						
Lourdes, moderately eroded	0-8	20-25	---	5.6-7.3	0	---
	8-14	20-25	---	4.5-7.3	0	---
	14-42	20-25	---	7.4-7.8	0-25	---
	42-47	20-25	---	7.4-7.8	0-25	---
	47-76	20-25	---	7.4-7.8	0-25	---

Table 20.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction	Calcium carbon-ate	Salinity
	In	meq/100 g	meq/100 g	pH	Pct	mmhos/cm
782B:						
Donnan----------------	0-8	20-25	---	5.1-7.3	0	---
	8-13	20-25	20-25	5.1-7.3	0	---
	13-18	20-25	20-25	5.1-7.3	0	---
	18-24	30-36	---	5.1-5.5	0	---
	24-48	20-25	---	5.1-6.5	0	---
	48-60	20-25	---	5.1-6.5	0	---
798:						
Protivin-------------	0-8	25-30	---	5.1-7.3	0	---
	8-15	25-30	---	5.1-7.3	0	---
	15-19	25-30	---	5.1-6.0	0	---
	19-23	25-30	---	5.1-6.0	0	---
	23-45	25-30	---	6.1-7.8	0-25	---
	45-60	25-30	---	6.1-7.8	0-25	---
809B:						
Bertram--------------	0-8	15-20	---	6.1-7.3	0	---
	8-17	15-20	---	6.1-7.3	0	---
	17-30	15-20	---	5.1-6.0	0	---
	30-34	20-25	---	5.6-7.8	0-20	---
	34-36	20-25	---	5.6-7.8	0-20	---
	36-80	---	---	---	---	---
877B:						
Dinsmore-------------	0-8	25-30	---	5.1-7.3	0	---
	8-16	25-30	---	5.1-7.3	0	---
	16-48	25-30	---	5.1-6.0	0	---
	48-80	25-30	---	5.6-8.4	0-25	---
884:						
Klingmore------------	0-8	30-36	---	5.1-7.3	0	---
	8-19	30-36	---	5.1-7.3	0	---
	19-56	30-36	---	5.1-6.5	0	---
	56-80	25-30	---	5.6-8.4	0-25	---
911B:						
Colo-----------------	0-8	36-41	---	5.6-7.3	0	---
	8-34	36-41	---	5.6-7.3	0	---
	34-40	36-41	---	5.6-7.3	0	---
	40-46	36-41	---	5.6-7.3	0	---
	46-52	36-41	---	5.6-7.3	0	---
	52-60	30-36	---	6.1-7.3	0	---
Ely------------------	0-8	30-36	---	5.6-7.3	0	---
	8-24	30-36	---	5.6-7.3	0	---
	24-32	30-36	---	5.6-7.3	0	---
	32-47	30-36	---	6.1-7.3	0	---
	47-58	30-36	---	6.6-8.4	0	---
	58-80	25-30	---	6.6-8.4	0-25	---
933:						
Sawmill, occasionally flooded-------------	0-10	36-41	---	6.1-7.8	0	---
	10-25	36-41	---	6.1-7.8	0	---
	25-32	36-41	---	6.1-7.8	0	---
	32-40	17-27	---	6.1-7.8	0	---
	40-58	17-27	---	6.1-7.8	0	---
	58-65	11-22	---	7.4-8.4	0-30	---

Table 20.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction	Calcium carbon-ate	Salinity
	In	meq/100 g	meq/100 g	pH	Pct	mmhos/cm
982:						
Maxmore	0-8	36-41	---	6.6-7.3	0	---
	8-20	36-41	---	6.6-7.3	0	---
	20-50	36-41	---	6.1-7.3	0	---
	50-80	25-30	---	6.1-7.8	0-25	---
1152:						
Marshan, 24 to 40 inches to sand and gravel	0-10	30-36	---	5.6-7.3	0	---
	10-14	30-36	---	5.6-7.3	0	---
	14-18	30-36	---	5.6-7.3	0	---
	18-23	20-25	---	5.6-7.3	0	---
	23-30	20-25	---	5.6-7.3	0	---
	30-40	5.0-10	---	6.1-7.3	0	---
	40-60	5.0-10	---	6.1-7.3	0	---
1226:						
Lawler, 24 to 40 inches to sand and gravel	0-8	20-25	---	5.6-7.3	0	---
	8-15	20-25	---	5.6-7.3	0	---
	15-21	20-25	---	5.6-7.3	0	---
	21-32	15-20	---	5.1-6.5	0	---
	32-37	15-20	---	5.1-6.5	0	---
	37-60	5.0-10	---	5.1-7.3	0	---
1285G:						
Burkhardt	0-10	15-20	---	5.1-6.5	0	---
	10-17	0.0-6.0	---	5.1-6.5	0	---
	17-19	0.0-6.0	---	5.6-6.5	0	---
	19-60	0.0-6.0	---	5.6-6.5	0	---
Bassett	0-5	20-25	---	5.1-7.3	0	---
	5-10	20-25	---	5.1-7.3	0	---
	10-14	20-25	---	5.1-7.3	0	---
	14-43	20-25	---	4.5-7.3	0-25	---
	43-59	20-25	---	4.5-7.3	0-25	---
	59-73	20-25	---	5.1-8.4	0-25	---
Chelsea	0-4	5.0-10	---	5.6-7.3	0	---
	4-30	5.0-10	---	5.1-6.5	0	---
	30-70	5.0-10	---	5.1-6.5	0	---
1585:						
Spillville, frequently flooded	0-54	20-25	---	5.6-7.3	0	---
	54-60	20-25	---	5.6-7.3	0	---
Coland, frequently flooded	0-32	30-36	---	6.1-7.3	0	---
	32-40	30-36	---	6.1-7.3	0	---
	40-44	20-30	---	6.1-7.8	0-20	---
	44-52	20-30	---	6.1-7.8	0-20	---
	52-60	20-30	---	6.1-7.8	0-20	---
Aquolls, ponded.						

Table 20.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction	Calcium carbon-ate	Salinity
	In	meq/100 g	meq/100 g	pH	Pct	mmhos/cm
1586:						
Sigglekov, frequently flooded-------------	0-9	10-15	---	5.6-6.5	0	---
	9-15	5.0-10	---	5.6-7.3	0	---
	15-35	5.0-10	---	5.6-7.3	0	---
	35-80	5.0-10	---	5.6-7.3	0	---
Fluvaquents, frequently flooded.						
Aquents, ponded.						
4000.						
Urban land						
4007:						
Wiota----------------	0-8	20-25	---	5.6-7.3	0	---
	8-22	20-25	---	5.6-7.3	0	---
	22-28	20-25	---	5.6-7.3	0	---
	28-48	20-25	---	5.6-6.5	0	---
	48-54	20-25	---	6.1-6.5	0	---
	54-80	5.0-10	---	5.1-6.5	0	---
Urban land.						
4041:						
Sparta---------------	0-11	10-15	---	5.1-7.3	0	---
	11-15	10-15	---	5.1-7.3	0	---
	15-34	1.0-6.0	---	5.1-6.5	0	---
	34-60	1.0-4.0	---	5.1-6.0	0	---
Urban land.						
4041B:						
Sparta---------------	0-11	10-15	---	5.1-7.3	0	---
	11-15	10-15	---	5.1-7.3	0	---
	15-34	1.0-6.0	---	5.1-6.5	0	---
	34-60	1.0-4.0	---	5.1-6.0	0	---
Urban land.						
4041C:						
Sparta---------------	0-9	10-15	---	5.1-7.3	0	---
	9-14	10-15	---	5.1-7.3	0	---
	14-32	1.0-6.0	---	5.1-6.5	0	---
	32-60	1.0-4.0	---	5.1-6.0	0	---
Urban land.						
4041D:						
Sparta---------------	0-9	10-15	---	5.1-7.3	0	---
	9-14	10-15	---	5.1-7.3	0	---
	14-30	1.0-6.0	---	5.1-6.5	0	---
	30-60	1.0-4.0	---	5.1-6.0	0	---
Urban land.						
4063B:						
Chelsea--------------	0-8	5.0-10	---	5.6-7.3	0	---
	8-36	5.0-10	---	5.1-6.5	0	---
	36-70	5.0-10	---	5.1-6.5	0	---

Table 20.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction	Calcium carbon-ate	Salinity
	In	meq/100 g	meq/100 g	pH	Pct	mmhos/cm
4063B:						
Urban land.						
4063C:						
Chelsea	0-8	5.0-10	---	5.6-7.3	0	---
	8-36	5.0-10	---	5.1-6.5	0	---
	36-70	5.0-10	---	5.1-6.5	0	---
Urban land.						
4063D:						
Chelsea	0-8	5.0-10	---	5.6-7.3	0	---
	8-32	5.0-10	---	5.1-6.5	0	---
	32-70	5.0-10	---	5.1-6.5	0	---
Urban land.						
4083B:						
Kenyon	0-8	20-25	---	5.6-7.3	0	---
	8-14	20-25	---	5.6-7.3	0	---
	14-19	20-25	---	5.6-7.3	0	---
	19-47	20-25	---	5.1-7.3	0-25	---
	47-54	20-25	---	6.6-8.4	0-25	---
	54-76	20-25	---	6.6-8.4	0-25	---
Urban land.						
4083C:						
Kenyon	0-8	20-25	---	5.6-7.3	0	---
	8-14	20-25	---	5.6-7.3	0	---
	14-19	20-25	---	5.6-7.3	0	---
	19-47	20-25	---	5.1-7.3	0-25	---
	47-54	20-25	---	6.6-8.4	0-25	---
	54-76	20-25	---	6.6-8.4	0-25	---
Urban land.						
4083D:						
Kenyon	0-8	20-25	---	5.6-7.3	0	---
	8-14	20-25	---	5.6-7.3	0	---
	14-19	20-25	---	5.6-7.3	0	---
	19-47	20-25	---	5.1-7.3	0-25	---
	47-54	20-25	---	6.6-8.4	0-25	---
	54-76	20-25	---	6.6-8.4	0-25	---
Urban land.						
4084:						
Clyde	0-8	36-41	---	6.6-7.3	0	---
	8-17	36-41	---	6.6-7.3	0	---
	17-23	36-41	---	6.6-7.3	0	---
	23-41	30-36	---	6.1-7.3	0	---
	41-44	20-25	---	6.1-7.3	0	---
	44-54	20-25	---	6.6-8.4	0-25	---
	54-66	20-25	---	6.6-8.4	0-25	---
Urban land.						

Table 20.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction	Calcium carbon-ate	Salinity
	In	meq/100 g	meq/100 g	pH	Pct	mmhos/cm
4088:						
Nevin----------------	0-8	30-36	---	5.6-7.3	0	---
	8-24	30-36	---	5.6-7.3	0	---
	24-30	30-36	---	5.6-7.3	0	---
	30-46	30-36	---	6.1-6.5	0	---
	46-58	30-36	---	6.1-6.5	0	---
	58-80	25-30	---	5.6-6.0	0	---
Urban land.						
4133:						
Colo, occasionally flooded-------------	0-8	36-41	---	5.6-7.3	0	---
	8-34	36-41	---	5.6-7.3	0	---
	34-40	36-41	---	5.6-7.3	0	---
	40-46	36-41	---	5.6-7.3	0	---
	46-52	36-41	---	5.6-7.3	0	---
	52-60	30-36	---	6.1-7.3	0	---
Urban land.						
4135:						
Coland, occasionally flooded-------------	0-8	30-36	---	6.1-7.3	0	---
	8-32	30-36	---	6.1-7.3	0	---
	32-40	30-36	---	6.1-7.3	0	---
	40-44	20-30	---	6.1-7.8	0-20	---
	44-52	20-30	---	6.1-7.8	0-20	---
	52-66	20-30	---	6.1-7.8	0-20	---
Urban land.						
4152:						
Marshan, 24 to 40 inches to sand and gravel--------------	0-10	30-36	---	5.6-7.3	0	---
	10-14	30-36	---	5.6-7.3	0	---
	14-18	30-36	---	5.6-7.3	0	---
	18-23	20-25	---	5.6-7.3	0	---
	23-30	20-25	---	5.6-7.3	0	---
	30-40	5.0-10	---	6.1-7.3	0	---
	40-60	5.0-10	---	6.1-7.3	0	---
Urban land.						
4159:						
Finchford------------	0-8	10-15	---	6.1-7.3	0	---
	8-18	10-15	---	6.1-7.3	0	---
	18-30	5.0-10	---	5.1-6.0	0	---
	30-55	5.0-10	---	5.6-6.5	0	---
	55-70	5.0-10	---	5.6-6.5	0	---
	70-80	5.0-10	---	5.6-6.5	0	---
Urban land.						

Table 20.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction	Calcium carbon-ate	Salinity
	In	meq/100 g	meq/100 g	pH	Pct	mmhos/cm
4159C:						
Finchford------------	0-8	10-15	---	6.1-7.3	0	---
	8-15	10-15	---	6.1-7.3	0	---
	15-26	5.0-10	---	5.1-6.0	0	---
	26-50	5.0-10	---	5.6-6.5	0	---
	50-65	5.0-10	---	5.6-6.5	0	---
	65-80	5.0-10	---	5.6-6.5	0	---
Urban land.						
4171B:						
Bassett--------------	0-8	20-25	---	5.1-7.3	0	---
	8-10	20-25	---	5.1-7.3	0	---
	10-14	20-25	---	5.1-7.3	0	---
	14-43	20-25	---	4.5-7.3	0-25	---
	43-59	20-25	---	4.5-7.3	0-25	---
	59-73	20-25	---	5.1-8.4	0-25	---
Urban land.						
4171D:						
Bassett--------------	0-8	20-25	---	5.1-7.3	0	---
	8-10	20-25	---	5.1-7.3	0	---
	10-14	20-25	---	5.1-7.3	0	---
	14-43	20-25	---	4.5-7.3	0-25	---
	43-59	20-25	---	4.5-7.3	0-25	---
	59-73	20-25	---	5.1-8.4	0-25	---
Urban land.						
4175:						
Dickinson------------	0-9	15-20	---	5.6-7.3	0	---
	9-18	15-20	---	5.1-6.5	0	---
	18-30	5.0-10	---	5.1-6.5	0	---
	30-36	5.0-10	---	5.1-6.5	0	---
	36-60	5.0-10	---	5.6-6.5	0	---
Urban land.						
4175B:						
Dickinson------------	0-9	15-20	---	5.6-7.3	0	---
	9-18	15-20	---	5.1-6.5	0	---
	18-30	5.0-10	---	5.1-6.5	0	---
	30-36	5.0-10	---	5.1-6.5	0	---
	36-60	5.0-10	---	5.6-6.5	0	---
Urban land.						
4177:						
Saude----------------	0-7	20-25	---	5.6-7.3	0	---
	7-13	20-25	---	5.6-7.3	0	---
	13-16	15-20	---	5.1-6.0	0	---
	16-24	15-20	---	5.1-6.0	0	---
	24-28	15-20	---	5.1-6.0	0	---
	28-36	5.0-10	---	5.1-6.5	0	---
	36-60	5.0-10	---	5.1-6.5	0	---
Urban land.						

Table 20.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction	Calcium carbon-ate	Salinity
	In	meq/100 g	meq/100 g	pH	Pct	mmhos/cm
4177B:						
Saude----------------	0-7	20-25	---	5.6-7.3	0	---
	7-13	20-25	---	5.6-7.3	0	---
	13-16	15-20	---	5.1-6.0	0	---
	16-24	15-20	---	5.1-6.0	0	---
	24-28	15-20	---	5.1-6.0	0	---
	28-36	5.0-10	---	5.1-6.5	0	---
	36-60	5.0-10	---	5.1-6.5	0	---
Urban land.						
4178:						
Waukee---------------	0-8	20-25	---	5.6-6.5	0	---
	8-16	20-25	---	5.6-6.5	0	---
	16-20	20-25	---	5.1-6.0	0	---
	20-35	20-25	---	5.1-6.0	0	---
	35-44	5.0-10	---	5.6-6.5	0	---
	44-66	5.0-10	---	5.6-6.5	0	---
Urban land.						
4184:						
Klinger--------------	0-9	30-36	---	5.1-7.3	0	---
	9-13	30-36	---	5.1-7.3	0	---
	13-19	30-36	---	5.1-7.3	0	---
	19-31	25-30	---	5.1-6.5	0	---
	31-40	15-20	---	5.1-7.8	0-25	---
	40-46	15-20	---	5.1-7.8	0-25	---
	46-64	15-20	---	5.1-7.8	0-25	---
Urban land.						
4198B:						
Floyd----------------	0-8	25-30	---	6.1-7.3	0	---
	8-24	25-30	---	6.1-7.3	0	---
	24-33	25-30	---	6.1-7.3	0	---
	33-41	5.0-10	---	6.6-7.3	0	---
	41-50	25-30	---	6.6-8.4	0-25	---
	50-60	25-30	---	6.6-8.4	0-25	---
Urban land.						
4226:						
Lawler, 24 to 40 inches to sand and gravel--------------	0-8	20-25	---	5.6-7.3	0	---
	8-15	20-25	---	5.6-7.3	0	---
	15-21	20-25	---	5.6-7.3	0	---
	21-32	15-20	---	5.1-6.5	0	---
	32-37	15-20	---	5.1-6.5	0	---
	37-60	5.0-10	---	5.1-7.3	0	---
Urban land.						
4284:						
Flagler--------------	0-8	15-20	---	5.6-7.3	0	---
	8-15	15-20	---	5.6-7.3	0	---
	15-22	15-20	---	5.6-7.3	0	---
	22-33	10-15	---	5.1-6.5	0	---
	33-65	5.0-10	---	5.1-7.3	0	---

Table 20.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction	Calcium carbon-ate	Salinity
	In	meq/100 g	meq/100 g	pH	Pct	mmhos/cm
4284:						
Urban land.						
4284B:						
Flagler--------------	0-8	15-20	---	5.6-7.3	0	---
	8-15	15-20	---	5.6-7.3	0	---
	15-22	15-20	---	5.6-7.3	0	---
	22-33	10-15	---	5.1-6.5	0	---
	33-65	5.0-10	---	5.1-7.3	0	---
Urban land.						
4377B:						
Dinsdale-------------	0-7	25-30	---	5.1-7.3	0	---
	7-15	25-30	---	5.1-7.3	0	---
	15-21	25-30	---	5.1-7.3	0	---
	21-36	25-30	---	5.1-7.3	0	---
	36-50	25-30	---	5.6-8.4	0-25	---
	50-80	25-30	---	5.6-8.4	0-25	---
Urban land.						
4377C:						
Dinsdale-------------	0-7	25-30	---	5.1-7.3	0	---
	7-15	25-30	---	5.1-7.3	0	---
	15-21	25-30	---	5.1-7.3	0	---
	21-36	25-30	---	5.1-7.3	0	---
	36-50	25-30	---	5.6-8.4	0-25	---
	50-80	25-30	---	5.6-8.4	0-25	---
Urban land.						
4382:						
Maxfield-------------	0-7	36-41	---	6.6-7.3	0	---
	7-17	36-41	---	6.6-7.3	0	---
	17-23	30-36	---	6.1-7.3	0	---
	23-32	30-36	---	6.1-7.3	0	---
	32-45	25-30	---	6.1-7.8	0-25	---
	45-66	25-30	---	6.1-7.8	0-25	---
Urban land.						
4391B:						
Clyde----------------	0-8	36-41	---	6.6-7.3	0	---
	8-17	36-41	---	6.6-7.3	0	---
	17-23	36-41	---	6.6-7.3	0	---
	23-41	30-36	---	6.1-7.3	0	---
	41-44	20-25	---	6.1-7.3	0	---
	44-54	20-25	---	6.6-8.4	0-25	---
	54-66	20-25	---	6.6-8.4	0-25	---
Floyd----------------	0-8	25-30	---	6.1-7.3	0	---
	8-24	25-30	---	6.1-7.3	0	---
	24-33	25-30	---	6.1-7.3	0	---
	33-41	5.0-10	---	6.6-7.3	0	---
	41-50	25-30	---	6.6-8.4	0-25	---
	50-60	25-30	---	6.6-8.4	0-25	---
Urban land.						

Table 20.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction	Calcium carbon-ate	Salinity
	In	meq/100 g	meq/100 g	pH	Pct	mmhos/cm
4398:						
Tripoli	0-9	36-41	---	6.6-7.3	0	---
	9-18	36-41	---	6.6-7.3	0	---
	18-24	30-36	---	6.6-7.8	0	---
	24-38	30-36	---	6.6-7.8	0-25	---
	38-66	25-30	---	7.4-8.4	0-25	---
Urban land.						
4399:						
Readlyn	0-7	25-30	---	5.1-7.3	0	---
	7-17	25-30	---	5.1-7.3	0	---
	17-43	25-30	---	5.1-6.5	0-25	---
	43-52	25-30	---	6.6-8.4	0-25	---
	52-60	25-30	---	6.6-8.4	0-25	---
Urban land.						
4408B:						
Olin	0-7	15-20	---	5.6-7.3	0	---
	7-23	15-20	---	5.6-7.3	0	---
	23-31	15-20	---	5.6-7.3	0	---
	31-52	15-20	---	5.1-6.0	0-25	---
	52-80	15-20	---	6.1-8.4	0-25	---
Urban land.						
4408C:						
Olin	0-7	15-20	---	5.6-7.3	0	---
	7-23	15-20	---	5.6-7.3	0	---
	23-31	15-20	---	5.6-7.3	0	---
	31-52	15-20	---	5.1-6.0	0-25	---
	52-80	15-20	---	6.1-8.4	0-25	---
Urban land.						
4426B:						
Aredale	0-7	20-25	---	5.6-7.3	0	---
	7-19	20-25	---	5.6-7.3	0	---
	19-33	20-25	---	5.1-6.0	0	---
	33-55	20-25	---	5.1-6.0	0	---
	55-70	20-25	---	5.6-7.3	0-25	---
Urban land.						
4426C:						
Aredale	0-7	20-25	---	5.6-7.3	0	---
	7-19	20-25	---	5.6-7.3	0	---
	19-33	20-25	---	5.1-6.0	0	---
	33-55	20-25	---	5.1-6.0	0	---
	55-70	20-25	---	5.6-7.3	0-25	---
Urban land.						
4585:						
Spillville, occasionally flooded	0-8	20-25	---	5.6-7.3	0	---
	8-54	20-25	---	5.6-7.3	0	---
	54-60	20-25	---	5.6-7.3	0	---

Table 20.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction	Calcium carbon-ate	Salinity
	In	meq/100 g	meq/100 g	pH	Pct	mmhos/cm
4585:						
Coland, occasionally flooded-------------	0-8	30-36	---	6.1-7.3	0	---
	8-32	30-36	---	6.1-7.3	0	---
	32-40	30-36	---	6.1-7.3	0	---
	40-44	20-30	---	6.1-7.8	0-20	---
	44-52	20-30	---	6.1-7.8	0-20	---
	52-60	20-30	---	6.1-7.8	0-20	---
Urban land.						
4761:						
Franklin-------------	0-6	20-25	---	4.5-7.3	0	---
	6-13	20-25	20-25	4.5-7.3	0	---
	13-18	20-25	20-25	4.5-6.0	0	---
	18-28	20-25	20-25	4.5-6.0	0	---
	28-37	20-25	---	5.1-8.4	0-25	---
	37-46	20-25	---	5.1-8.4	0-25	---
	46-64	20-25	---	5.1-8.4	0-25	---
	64-74	20-25	---	5.1-8.4	0-25	---
Urban land.						
4771B:						
Waubeek--------------	0-7	20-25	---	5.6-7.3	0	---
	7-13	20-25	---	5.6-7.3	0	---
	13-29	20-25	---	5.1-6.0	0	---
	29-34	20-25	---	5.1-7.3	0-25	---
	34-45	20-25	---	5.1-7.3	0-25	---
	45-67	20-25	---	5.1-7.3	0-25	---
Urban land.						
4771D:						
Waubeek--------------	0-7	20-25	---	5.6-7.3	0	---
	7-13	20-25	---	5.6-7.3	0	---
	13-29	20-25	---	5.1-6.0	0	---
	29-34	20-25	---	5.1-7.3	0-25	---
	34-45	20-25	---	5.1-7.3	0-25	---
	45-67	20-25	---	5.1-7.3	0-25	---
Urban land.						
4798:						
Protivin-------------	0-8	25-30	---	5.1-7.3	0	---
	8-15	25-30	---	5.1-7.3	0	---
	15-19	25-30	---	5.1-6.0	0	---
	19-23	25-30	---	5.1-6.0	0	---
	23-45	25-30	---	6.1-7.8	0-25	---
	45-60	25-30	---	6.1-7.8	0-25	---
Urban land.						
4911B:						
Colo-----------------	0-8	36-41	---	5.6-7.3	0	---
	8-34	36-41	---	5.6-7.3	0	---
	34-40	36-41	---	5.6-7.3	0	---
	40-46	36-41	---	5.6-7.3	0	---
	46-52	36-41	---	5.6-7.3	0	---
	52-60	30-36	---	6.1-7.3	0	---

Table 20.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction	Calcium carbon-ate	Salinity
	In	meq/100 g	meq/100 g	pH	Pct	mmhos/cm
4911B:						
Ely------------------	0-8	30-36	---	5.6-7.3	0	---
	8-24	30-36	---	5.6-7.3	0	---
	24-32	30-36	---	5.6-7.3	0	---
	32-47	30-36	---	6.1-7.3	0	---
	47-58	30-36	---	6.6-8.4	0	---
	58-80	25-30	---	6.6-8.4	0-25	---
Urban land.						
4933:						
Sawmill, occasionally flooded-------------	0-10	36-41	---	6.1-7.8	0	---
	10-25	36-41	---	6.1-7.8	0	---
	25-32	36-41	---	6.1-7.8	0	---
	32-40	17-27	---	6.1-7.8	0	---
	40-58	17-27	---	6.1-7.8	0	---
	58-65	11-22	---	7.4-8.4	0-30	---
Urban land.						
4946:						
Orthents, loamy.						
Urban land.						
5010.						
Pits, sand and gravel						
5030.						
Pits, limestone quarries						
5040.						
Orthents, loamy						
5053.						
Psammaquents, frequently flooded						
5080.						
Orthents, sanitary landfill						
AW.						
Animal waste						
SL.						
Sewage lagoon						
W.						
Water						

Table 21.--Water Features

(See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map symbol and soil name	Hydrologic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
7:									
Wiota	B								
		Jan-Dec	---	---	---	---	None	---	None
41:									
Sparta	A								
		Jan-Dec	---	---	---	---	None	---	None
41B:									
Sparta	A								
		Jan-Dec	---	---	---	---	None	---	None
41C:									
Sparta	A								
		Jan-Dec	---	---	---	---	None	---	None
41D:									
Sparta	A								
		Jan-Dec	---	---	---	---	None	---	None
63B:									
Chelsea	A								
		Jan-Dec	---	---	---	---	None	---	None
63C:									
Chelsea	A								
		Jan-Dec	---	---	---	---	None	---	None
63D:									
Chelsea	A								
		Jan-Dec	---	---	---	---	None	---	None
83B:									
Kenyon	B								
		January	6.0-6.7	>6.0	---	---	None	---	None
		February	5.5-6.7	>6.0	---	---	None	---	None
		March	4.5-6.5	>6.0	---	---	None	---	None
		April	4.0-6.0	>6.0	---	---	None	---	None
		May	4.5-6.5	>6.0	---	---	None	---	None
		June	5.0-6.7	>6.0	---	---	None	---	None
		July	6.0-6.7	>6.0	---	---	None	---	None
		August	6.5-6.7	>6.0	---	---	None	---	None
		October	6.5-6.7	>6.0	---	---	None	---	None
		November	5.5-6.7	>6.0	---	---	None	---	None
		December	6.0-6.7	>6.0	---	---	None	---	None

Table 21.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
83C:									
Kenyon--------------------	B								
		January	6.0-6.7	>6.0	---	---	None	---	None
		February	5.5-6.7	>6.0	---	---	None	---	None
		March	4.5-6.5	>6.0	---	---	None	---	None
		April	4.0-6.0	>6.0	---	---	None	---	None
		May	4.5-6.5	>6.0	---	---	None	---	None
		June	5.0-6.7	>6.0	---	---	None	---	None
		July	6.0-6.7	>6.0	---	---	None	---	None
		August	6.5-6.7	>6.0	---	---	None	---	None
		October	6.5-6.7	>6.0	---	---	None	---	None
		November	5.5-6.7	>6.0	---	---	None	---	None
		December	6.0-6.7	>6.0	---	---	None	---	None
83C2:									
Kenyon, moderately eroded	B								
		January	6.0-6.7	>6.0	---	---	None	---	None
		February	5.5-6.7	>6.0	---	---	None	---	None
		March	4.5-6.5	>6.0	---	---	None	---	None
		April	4.0-6.0	>6.0	---	---	None	---	None
		May	4.5-6.5	>6.0	---	---	None	---	None
		June	5.0-6.7	>6.0	---	---	None	---	None
		July	6.0-6.7	>6.0	---	---	None	---	None
		August	6.5-6.7	>6.0	---	---	None	---	None
		October	6.5-6.7	>6.0	---	---	None	---	None
		November	5.5-6.7	>6.0	---	---	None	---	None
		December	6.0-6.7	>6.0	---	---	None	---	None
83D2:									
Kenyon, moderately eroded	B								
		January	6.0-6.7	>6.0	---	---	None	---	None
		February	5.5-6.7	>6.0	---	---	None	---	None
		March	4.5-6.5	>6.0	---	---	None	---	None
		April	4.0-6.0	>6.0	---	---	None	---	None
		May	4.5-6.5	>6.0	---	---	None	---	None
		June	5.0-6.7	>6.0	---	---	None	---	None
		July	6.0-6.7	>6.0	---	---	None	---	None
		August	6.5-6.7	>6.0	---	---	None	---	None
		October	6.5-6.7	>6.0	---	---	None	---	None
		November	5.5-6.7	>6.0	---	---	None	---	None
		December	6.0-6.7	>6.0	---	---	None	---	None
84:									
Clyde---------------------	B/D								
		January	2.0-3.5	>6.0	---	---	None	---	None
		February	1.5-3.0	>6.0	---	---	None	---	None
		March	0.5-2.0	>6.0	---	---	None	---	None
		April	0.0-1.0	>6.0	---	---	None	---	None
		May	0.5-1.5	>6.0	---	---	None	---	None
		June	1.0-2.0	>6.0	---	---	None	---	None
		July	2.0-3.0	>6.0	---	---	None	---	None
		August	2.5-3.5	>6.0	---	---	None	---	None
		September	3.0-4.0	>6.0	---	---	None	---	None
		October	2.5-3.5	>6.0	---	---	None	---	None
		November	1.5-3.0	>6.0	---	---	None	---	None
		December	2.0-3.5	>6.0	---	---	None	---	None

Table 21.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table Upper limit	Water table Lower limit	Ponding Surface water depth	Ponding Duration	Ponding Frequency	Flooding Duration	Flooding Frequency
			Ft	Ft	Ft				
88:									
Nevin	B								
		January	3.0-5.5	>6.0	---	---	None	---	None
		February	2.5-5.0	>6.0	---	---	None	---	None
		March	1.5-4.0	>6.0	---	---	None	Brief	Rare
		April	1.0-3.5	>6.0	---	---	None	Brief	Rare
		May	1.5-4.0	>6.0	---	---	None	Brief	Rare
		June	2.0-4.5	>6.0	---	---	None	Brief	Rare
		July	3.0-5.5	>6.0	---	---	None	Brief	Rare
		August	3.5-6.0	>6.0	---	---	None	Brief	Rare
		September	4.0-6.5	>6.0	---	---	None	Brief	Rare
		October	3.5-6.0	>6.0	---	---	None	Brief	Rare
		November	2.5-5.0	>6.0	---	---	None	Brief	Rare
		December	3.0-5.5	>6.0	---	---	None	---	None
133:									
Colo, occasionally flooded	B/D								
		January	2.0-3.5	>6.0	---	---	None	---	None
		February	1.5-3.0	0.7-6.7	---	---	None	Long	Occasional
		March	0.5-2.0	>6.0	---	---	None	Long	Occasional
		April	0.0-1.0	>6.0	---	---	None	Long	Occasional
		May	0.5-1.5	>6.0	---	---	None	Long	Occasional
		June	1.0-2.0	>6.0	---	---	None	Long	Occasional
		July	2.0-3.0	>6.0	---	---	None	Long	Occasional
		August	2.5-3.5	>6.0	---	---	None	Long	Occasional
		September	3.0-4.0	>6.0	---	---	None	Long	Occasional
		October	2.5-3.5	>6.0	---	---	None	Long	Occasional
		November	1.5-3.0	>6.0	---	---	None	Long	Occasional
		December	2.0-3.5	>6.0	---	---	None	---	None
135:									
Coland, occasionally flooded	B/D								
		January	2.0-3.5	>6.0	---	---	None	---	None
		February	1.5-3.0	0.7-6.7	---	---	None	Long	Occasional
		March	0.5-2.0	>6.0	---	---	None	Long	Occasional
		April	0.0-1.0	>6.0	---	---	None	Long	Occasional
		May	0.5-1.5	>6.0	---	---	None	Long	Occasional
		June	1.0-2.0	>6.0	---	---	None	Long	Occasional
		July	2.0-3.0	>6.0	---	---	None	Long	Occasional
		August	2.5-3.5	>6.0	---	---	None	Long	Occasional
		September	3.0-4.0	>6.0	---	---	None	Long	Occasional
		October	2.5-3.5	>6.0	---	---	None	Long	Occasional
		November	1.5-3.0	>6.0	---	---	None	Long	Occasional
		December	2.0-3.5	>6.0	---	---	None	---	None
159:									
Finchford	A								
		Jan-Dec	---	---	---	---	None	---	None
159C:									
Finchford	A								
		Jan-Dec	---	---	---	---	None	---	None

Table 21.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
171B:									
Bassett-------------------	B								
		January	4.0-6.0	>6.0	---	---	None	---	None
		February	3.5-5.5	>6.0	---	---	None	---	None
		March	2.5-4.5	>6.0	---	---	None	---	None
		April	2.0-4.0	>6.0	---	---	None	---	None
		May	2.5-4.5	>6.0	---	---	None	---	None
		June	3.0-5.0	>6.0	---	---	None	---	None
		July	4.0-6.0	>6.0	---	---	None	---	None
		August	4.5-6.5	>6.0	---	---	None	---	None
		September	5.0-6.7	>6.0	---	---	None	---	None
		October	4.5-6.5	>6.0	---	---	None	---	None
		November	3.5-5.5	>6.0	---	---	None	---	None
		December	4.0-6.0	>6.0	---	---	None	---	None
175:									
Dickinson-----------------	B								
		Jan-Dec	---	---	---	---	None	---	None
175B:									
Dickinson-----------------	B								
		Jan-Dec	---	---	---	---	None	---	None
177:									
Saude---------------------	B								
		Jan-Dec	---	---	---	---	None	---	None
177B:									
Saude---------------------	B								
		Jan-Dec	---	---	---	---	None	---	None
178:									
Waukee--------------------	B								
		Jan-Dec	---	---	---	---	None	---	None
178B:									
Waukee--------------------	B								
		Jan-Dec	---	---	---	---	None	---	None
184:									
Klinger-------------------	B								
		January	3.0-5.5	>6.0	---	---	None	---	None
		February	2.5-5.0	>6.0	---	---	None	---	None
		March	1.5-4.0	>6.0	---	---	None	---	None
		April	1.0-3.5	>6.0	---	---	None	---	None
		May	1.5-4.0	>6.0	---	---	None	---	None
		June	3.0-5.5	>6.0	---	---	None	---	None
		July	3.0-5.5	>6.0	---	---	None	---	None
		August	3.5-6.0	>6.0	---	---	None	---	None
		September	4.0-6.5	>6.0	---	---	None	---	None
		October	3.5-6.0	>6.0	---	---	None	---	None
		November	2.5-5.0	>6.0	---	---	None	---	None
		December	3.0-5.5	>6.0	---	---	None	---	None

Table 21.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
198B:									
Floyd	B								
		January	3.0-5.5	>6.0	---	---	None	---	None
		February	2.5-5.0	>6.0	---	---	None	---	None
		March	1.5-4.0	>6.0	---	---	None	---	None
		April	1.0-3.5	>6.0	---	---	None	---	None
		May	1.5-4.0	>6.0	---	---	None	---	None
		June	3.0-5.5	>6.0	---	---	None	---	None
		July	3.0-5.5	>6.0	---	---	None	---	None
		August	3.5-6.0	>6.0	---	---	None	---	None
		September	4.0-6.5	>6.0	---	---	None	---	None
		October	3.5-6.0	>6.0	---	---	None	---	None
		November	2.5-5.0	>6.0	---	---	None	---	None
		December	3.0-5.5	>6.0	---	---	None	---	None
213B:									
Rockton, 30 to 40 inches to limestone	B								
		Jan-Dec	---	---	---	---	None	---	None
221:									
Klossner	A/D								
		January	0.0	>6.0	---	---	None	---	None
		February	0.0	>6.0	---	---	None	---	None
		March	0.0	>6.0	---	---	None	---	None
		April	0.0	>6.0	---	---	None	---	None
		May	0.0	>6.0	---	---	None	---	None
		June	0.0	>6.0	---	---	None	---	None
		July	0.0	>6.0	---	---	None	---	None
		August	0.0	>6.0	---	---	None	---	None
		September	0.0	>6.0	---	---	None	---	None
		October	0.0	>6.0	---	---	None	---	None
		November	0.0	>6.0	---	---	None	---	None
		December	0.0	>6.0	---	---	None	---	None
284:									
Flagler	B								
		Jan-Dec	---	---	---	---	None	---	None
284B:									
Flagler	B								
		Jan-Dec	---	---	---	---	None	---	None
290:									
Dells	C								
		January	3.0-5.5	>6.0	---	---	None	---	None
		February	2.5-5.0	>6.0	---	---	None	---	None
		March	1.5-4.0	>6.0	---	---	None	---	None
		April	1.0-3.5	>6.0	---	---	None	---	None
		May	1.5-4.0	>6.0	---	---	None	---	None
		June	3.0-5.5	>6.0	---	---	None	---	None
		July	3.0-5.5	>6.0	---	---	None	---	None
		August	3.5-6.0	>6.0	---	---	None	---	None
		September	4.0-6.5	>6.0	---	---	None	---	None
		October	3.5-6.0	>6.0	---	---	None	---	None
		November	2.5-5.0	>6.0	---	---	None	---	None
		December	3.0-5.5	>6.0	---	---	None	---	None

Table 21.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
354:									
Aquolls, ponded-----------	A/D								
		January	0.0	>6.0	0.7-1.3	Very long	Frequent	---	None
		February	0.0	>6.0	0.7-1.3	Very long	Frequent	---	None
		March	0.0	>6.0	1.2-1.8	Very long	Frequent	---	None
		April	0.0	>6.0	1.7-2.3	Very long	Frequent	---	None
		May	0.0	>6.0	1.7-2.3	Very long	Frequent	---	None
		June	0.0	>6.0	1.2-1.8	Very long	Frequent	---	None
		July	0.0	>6.0	0.7-1.3	Very long	Frequent	---	None
		August	0.0	>6.0	0.2-0.8	Very long	Frequent	---	None
		September	0.0	>6.0	0.2-0.8	Very long	Frequent	---	None
		October	0.0	>6.0	0.2-0.8	Very long	Frequent	---	None
		November	0.0	>6.0	0.7-1.3	Very long	Frequent	---	None
		December	0.0	>6.0	0.7-1.3	Very long	Frequent	---	None
377B:									
Dinsdale------------------	B								
		January	6.0-6.7	>6.0	---	---	None	---	None
		February	5.5-6.7	>6.0	---	---	None	---	None
		March	4.5-6.5	>6.0	---	---	None	---	None
		April	4.0-6.0	>6.0	---	---	None	---	None
		May	4.5-6.5	>6.0	---	---	None	---	None
		June	5.0-6.7	>6.0	---	---	None	---	None
		July	6.0-6.7	>6.0	---	---	None	---	None
		August	6.5-6.7	>6.0	---	---	None	---	None
		October	6.5-6.7	>6.0	---	---	None	---	None
		November	5.5-6.7	>6.0	---	---	None	---	None
		December	6.0-6.7	>6.0	---	---	None	---	None
377C:									
Dinsdale------------------	B								
		January	6.0-6.7	>6.0	---	---	None	---	None
		February	5.5-6.7	>6.0	---	---	None	---	None
		March	4.5-6.5	>6.0	---	---	None	---	None
		April	4.0-6.0	>6.0	---	---	None	---	None
		May	4.5-6.5	>6.0	---	---	None	---	None
		June	5.0-6.7	>6.0	---	---	None	---	None
		July	6.0-6.7	>6.0	---	---	None	---	None
		August	6.5-6.7	>6.0	---	---	None	---	None
		October	6.5-6.7	>6.0	---	---	None	---	None
		November	5.5-6.7	>6.0	---	---	None	---	None
		December	6.0-6.7	>6.0	---	---	None	---	None
377C2:									
Dinsdale, moderately eroded------------------	B								
		January	6.0-6.7	>6.0	---	---	None	---	None
		February	5.5-6.7	>6.0	---	---	None	---	None
		March	4.5-6.5	>6.0	---	---	None	---	None
		April	4.0-6.0	>6.0	---	---	None	---	None
		May	4.5-6.5	>6.0	---	---	None	---	None
		June	5.0-6.7	>6.0	---	---	None	---	None
		July	6.0-6.7	>6.0	---	---	None	---	None
		August	6.5-6.7	>6.0	---	---	None	---	None
		October	6.5-6.7	>6.0	---	---	None	---	None
		November	5.5-6.7	>6.0	---	---	None	---	None
		December	6.0-6.7	>6.0	---	---	None	---	None

Table 21.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
382:									
Maxfield	B/D								
		January	2.0-3.5	>6.0	---	---	None	---	None
		February	1.5-3.0	>6.0	---	---	None	---	None
		March	0.5-2.0	>6.0	---	---	None	---	None
		April	0.0-1.0	>6.0	---	---	None	---	None
		May	0.5-1.5	>6.0	---	---	None	---	None
		June	1.0-2.0	>6.0	---	---	None	---	None
		July	2.0-3.0	>6.0	---	---	None	---	None
		August	2.5-3.5	>6.0	---	---	None	---	None
		September	3.0-4.0	>6.0	---	---	None	---	None
		October	2.5-3.5	>6.0	---	---	None	---	None
		November	1.5-3.0	>6.0	---	---	None	---	None
		December	2.0-3.5	>6.0	---	---	None	---	None
391B:									
Clyde	B/D								
		January	2.0-3.5	>6.0	---	---	None	---	None
		February	1.5-3.0	>6.0	---	---	None	---	None
		March	0.5-2.0	>6.0	---	---	None	---	None
		April	0.0-1.0	>6.0	---	---	None	---	None
		May	0.5-1.5	>6.0	---	---	None	---	None
		June	1.0-2.0	>6.0	---	---	None	---	None
		July	2.0-3.0	>6.0	---	---	None	---	None
		August	2.5-3.5	>6.0	---	---	None	---	None
		September	3.0-4.0	>6.0	---	---	None	---	None
		October	2.5-3.5	>6.0	---	---	None	---	None
		November	1.5-3.0	>6.0	---	---	None	---	None
		December	2.0-3.5	>6.0	---	---	None	---	None
Floyd	B								
		January	3.0-5.5	>6.0	---	---	None	---	None
		February	2.5-5.0	>6.0	---	---	None	---	None
		March	1.5-4.0	>6.0	---	---	None	---	None
		April	1.0-3.5	>6.0	---	---	None	---	None
		May	1.5-4.0	>6.0	---	---	None	---	None
		June	3.0-5.5	>6.0	---	---	None	---	None
		July	3.0-5.5	>6.0	---	---	None	---	None
		August	3.5-6.0	>6.0	---	---	None	---	None
		September	4.0-6.5	>6.0	---	---	None	---	None
		October	3.5-6.0	>6.0	---	---	None	---	None
		November	2.5-5.0	>6.0	---	---	None	---	None
		December	3.0-5.5	>6.0	---	---	None	---	None
395B:									
Marquis	B								
		January	4.0-6.0	>6.0	---	---	None	---	None
		February	3.5-5.5	>6.0	---	---	None	---	None
		March	2.5-4.5	>6.0	---	---	None	---	None
		April	2.0-4.0	>6.0	---	---	None	---	None
		May	2.5-4.5	>6.0	---	---	None	---	None
		June	3.0-5.0	>6.0	---	---	None	---	None
		July	4.0-6.0	>6.0	---	---	None	---	None
		August	4.5-6.5	>6.0	---	---	None	---	None
		September	5.0-6.7	>6.0	---	---	None	---	None
		October	4.5-6.5	>6.0	---	---	None	---	None
		November	3.5-5.5	>6.0	---	---	None	---	None
		December	4.0-6.0	>6.0	---	---	None	---	None

Table 21.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
398:									
Tripoli	B/D								
		January	2.0-3.5	>6.0	---	---	None	---	None
		February	1.5-3.0	>6.0	---	---	None	---	None
		March	0.5-2.0	>6.0	---	---	None	---	None
		April	0.0-1.0	>6.0	---	---	None	---	None
		May	0.5-1.5	>6.0	---	---	None	---	None
		June	1.0-2.0	>6.0	---	---	None	---	None
		July	2.0-3.0	>6.0	---	---	None	---	None
		August	2.5-3.5	>6.0	---	---	None	---	None
		September	3.0-4.0	>6.0	---	---	None	---	None
		October	2.5-3.5	>6.0	---	---	None	---	None
		November	1.5-3.0	>6.0	---	---	None	---	None
		December	2.0-3.5	>6.0	---	---	None	---	None
399:									
Readlyn	B								
		January	3.0-5.5	>6.0	---	---	None	---	None
		February	2.5-5.0	>6.0	---	---	None	---	None
		March	1.5-4.0	>6.0	---	---	None	---	None
		April	1.0-3.5	>6.0	---	---	None	---	None
		May	1.5-4.0	>6.0	---	---	None	---	None
		June	3.0-5.5	>6.0	---	---	None	---	None
		July	3.0-5.5	>6.0	---	---	None	---	None
		August	3.5-6.0	>6.0	---	---	None	---	None
		September	4.0-6.5	>6.0	---	---	None	---	None
		October	3.5-6.0	>6.0	---	---	None	---	None
		November	2.5-5.0	>6.0	---	---	None	---	None
		December	3.0-5.5	>6.0	---	---	None	---	None
408B:									
Olin	B								
		Jan-Dec	---	---	---	---	None	---	None
408C:									
Olin	B								
		Jan-Dec	---	---	---	---	None	---	None
412C:									
Emeline	D								
		Jan-Dec	---	---	---	---	None	---	None
426B:									
Aredale	B								
		Jan-Dec	---	---	---	---	None	---	None
426C:									
Aredale	B								
		Jan-Dec	---	---	---	---	None	---	None
426C2:									
Aredale, moderately eroded	B								
		Jan-Dec	---	---	---	---	None	---	None

Table 21.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Months	Water table Upper limit	Water table Lower limit	Ponding Surface water depth	Ponding Duration	Ponding Frequency	Flooding Duration	Flooding Frequency
			Ft	Ft	Ft				
468B:									
Dunkerton	B								
		January	3.0-5.5	>6.0	---	---	None	---	None
		February	2.5-5.0	>6.0	---	---	None	---	None
		March	1.5-4.0	>6.0	---	---	None	---	None
		April	1.0-3.5	>6.0	---	---	None	---	None
		May	1.5-4.0	>6.0	---	---	None	---	None
		June	3.0-5.5	>6.0	---	---	None	---	None
		July	3.0-5.5	>6.0	---	---	None	---	None
		August	3.5-6.0	>6.0	---	---	None	---	None
		September	4.0-6.5	>6.0	---	---	None	---	None
		October	3.5-6.0	>6.0	---	---	None	---	None
		November	2.5-5.0	>6.0	---	---	None	---	None
		December	3.0-5.5	>6.0	---	---	None	---	None
468C:									
Dunkerton	B								
		January	3.0-5.5	>6.0	---	---	None	---	None
		February	2.5-5.0	>6.0	---	---	None	---	None
		March	1.5-4.0	>6.0	---	---	None	---	None
		April	1.0-3.5	>6.0	---	---	None	---	None
		May	1.5-4.0	>6.0	---	---	None	---	None
		June	3.0-5.5	>6.0	---	---	None	---	None
		July	3.0-5.5	>6.0	---	---	None	---	None
		August	3.5-6.0	>6.0	---	---	None	---	None
		September	4.0-6.5	>6.0	---	---	None	---	None
		October	3.5-6.0	>6.0	---	---	None	---	None
		November	2.5-5.0	>6.0	---	---	None	---	None
		December	3.0-5.5	>6.0	---	---	None	---	None
471:									
Oran	B								
		January	3.0-5.5	>6.0	---	---	None	---	None
		February	2.5-5.0	>6.0	---	---	None	---	None
		March	1.5-4.0	>6.0	---	---	None	---	None
		April	1.0-3.5	>6.0	---	---	None	---	None
		May	1.5-4.0	>6.0	---	---	None	---	None
		June	3.0-5.5	>6.0	---	---	None	---	None
		July	3.0-5.5	>6.0	---	---	None	---	None
		August	3.5-6.0	>6.0	---	---	None	---	None
		September	4.0-6.5	>6.0	---	---	None	---	None
		October	3.5-6.0	>6.0	---	---	None	---	None
		November	2.5-5.0	>6.0	---	---	None	---	None
		December	3.0-5.5	>6.0	---	---	None	---	None
485:									
Spillville, occasionally flooded	B								
		January	3.0-5.5	>6.0	---	---	None	---	None
		February	2.5-5.0	>6.0	---	---	None	Long	Occasional
		March	1.5-4.0	>6.0	---	---	None	Long	Occasional
		April	1.0-3.5	>6.0	---	---	None	Long	Occasional
		May	1.5-4.0	>6.0	---	---	None	Long	Occasional
		June	2.0-4.5	>6.0	---	---	None	Long	Occasional
		July	3.0-5.5	>6.0	---	---	None	Long	Occasional
		August	3.5-6.0	>6.0	---	---	None	Long	Occasional
		September	4.0-6.5	>6.0	---	---	None	Long	Occasional
		October	3.5-6.0	>6.0	---	---	None	Long	Occasional
		November	2.5-5.0	>6.0	---	---	None	Long	Occasional
		December	3.0-5.5	>6.0	---	---	None	---	None

Table 21.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
585:									
Spillville, occasionally flooded	B								
		January	3.0-5.5	>6.0	---	---	None	---	None
		February	2.5-5.0	>6.0	---	---	None	Long	Occasional
		March	1.5-4.0	>6.0	---	---	None	Long	Occasional
		April	1.0-3.5	>6.0	---	---	None	Long	Occasional
		May	1.5-4.0	>6.0	---	---	None	Long	Occasional
		June	2.0-4.5	>6.0	---	---	None	Long	Occasional
		July	3.0-5.5	>6.0	---	---	None	Long	Occasional
		August	3.5-6.0	>6.0	---	---	None	Long	Occasional
		September	4.0-6.5	>6.0	---	---	None	Long	Occasional
		October	3.5-6.0	>6.0	---	---	None	Long	Occasional
		November	2.5-5.0	>6.0	---	---	None	Long	Occasional
		December	3.0-5.5	>6.0	---	---	None	---	None
Coland, occasionally flooded	B/D								
		January	2.0-3.5	>6.0	---	---	None	---	None
		February	1.5-3.0	0.7-6.7	---	---	None	Long	Occasional
		March	0.5-2.0	>6.0	---	---	None	Long	Occasional
		April	0.0-1.0	>6.0	---	---	None	Long	Occasional
		May	0.5-1.5	>6.0	---	---	None	Long	Occasional
		June	1.0-2.0	>6.0	---	---	None	Long	Occasional
		July	2.0-3.0	>6.0	---	---	None	Long	Occasional
		August	2.5-3.5	>6.0	---	---	None	Long	Occasional
		September	3.0-4.0	>6.0	---	---	None	Long	Occasional
		October	2.5-3.5	>6.0	---	---	None	Long	Occasional
		November	1.5-3.0	>6.0	---	---	None	Long	Occasional
		December	2.0-3.5	>6.0	---	---	None	---	None
626:									
Hayfield, 24 to 40 inches to sand and gravel	B								
		January	3.0-5.5	>6.0	---	---	None	---	None
		February	2.5-5.0	>6.0	---	---	None	---	None
		March	1.5-4.0	>6.0	---	---	None	---	None
		April	1.0-3.5	>6.0	---	---	None	---	None
		May	1.5-4.0	>6.0	---	---	None	---	None
		June	3.0-5.5	>6.0	---	---	None	---	None
		July	3.0-5.5	>6.0	---	---	None	---	None
		August	3.5-6.0	>6.0	---	---	None	---	None
		September	4.0-6.5	>6.0	---	---	None	---	None
		October	3.5-6.0	>6.0	---	---	None	---	None
		November	2.5-5.0	>6.0	---	---	None	---	None
		December	3.0-5.5	>6.0	---	---	None	---	None
761:									
Franklin	B								
		January	3.0-5.5	>6.0	---	---	None	---	None
		February	2.5-5.0	>6.0	---	---	None	---	None
		March	1.5-4.0	>6.0	---	---	None	---	None
		April	1.0-3.5	>6.0	---	---	None	---	None
		May	1.5-4.0	>6.0	---	---	None	---	None
		June	3.0-5.5	>6.0	---	---	None	---	None
		July	3.0-5.5	>6.0	---	---	None	---	None
		August	3.5-6.0	>6.0	---	---	None	---	None
		September	4.0-6.5	>6.0	---	---	None	---	None
		October	3.5-6.0	>6.0	---	---	None	---	None
		November	2.5-5.0	>6.0	---	---	None	---	None
		December	3.0-5.5	>6.0	---	---	None	---	None

Table 21.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
771B:									
Waubeek	B								
		January	6.0-6.7	>6.0	---	---	None	---	None
		February	5.5-6.7	>6.0	---	---	None	---	None
		March	4.5-6.5	>6.0	---	---	None	---	None
		April	4.0-6.0	>6.0	---	---	None	---	None
		May	4.5-6.5	>6.0	---	---	None	---	None
		June	5.0-6.7	>6.0	---	---	None	---	None
		July	6.0-6.7	>6.0	---	---	None	---	None
		August	6.5-6.7	>6.0	---	---	None	---	None
		October	6.5-6.7	>6.0	---	---	None	---	None
		November	5.5-6.7	>6.0	---	---	None	---	None
		December	6.0-6.7	>6.0	---	---	None	---	None
775B:									
Billett	B								
		Jan-Dec	---	---	---	---	None	---	None
776C:									
Lilah	A								
		Jan-Dec	---	---	---	---	None	---	None
777:									
Wapsie	B								
		Jan-Dec	---	---	---	---	None	---	None
781B:									
Lourdes	C								
		January	6.0-6.7	>6.0	---	---	None	---	None
		February	5.5-6.7	>6.0	---	---	None	---	None
		March	4.5-6.5	>6.0	---	---	None	---	None
		April	4.0-6.0	>6.0	---	---	None	---	None
		May	4.5-6.5	>6.0	---	---	None	---	None
		June	5.0-6.7	>6.0	---	---	None	---	None
		July	6.0-6.7	>6.0	---	---	None	---	None
		August	6.5-6.7	>6.0	---	---	None	---	None
		October	6.5-6.7	>6.0	---	---	None	---	None
		November	5.5-6.7	>6.0	---	---	None	---	None
		December	6.0-6.7	>6.0	---	---	None	---	None
781C2:									
Lourdes, moderately eroded	C								
		January	6.0-6.7	>6.0	---	---	None	---	None
		February	5.5-6.7	>6.0	---	---	None	---	None
		March	4.5-6.5	>6.0	---	---	None	---	None
		April	4.0-6.0	>6.0	---	---	None	---	None
		May	4.5-6.5	>6.0	---	---	None	---	None
		June	5.0-6.7	>6.0	---	---	None	---	None
		July	6.0-6.7	>6.0	---	---	None	---	None
		August	6.5-6.7	>6.0	---	---	None	---	None
		October	6.5-6.7	>6.0	---	---	None	---	None
		November	5.5-6.7	>6.0	---	---	None	---	None
		December	6.0-6.7	>6.0	---	---	None	---	None

Table 21.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
782B:									
Donnan-------------------	C								
		January	3.0-5.5	>6.0	---	---	None	---	None
		February	2.5-5.0	>6.0	---	---	None	---	None
		March	1.5-4.0	>6.0	---	---	None	---	None
		April	1.0-3.5	>6.0	---	---	None	---	None
		May	1.5-4.0	>6.0	---	---	None	---	None
		June	3.0-5.5	>6.0	---	---	None	---	None
		July	3.0-5.5	>6.0	---	---	None	---	None
		August	3.5-6.0	>6.0	---	---	None	---	None
		September	4.0-6.5	>6.0	---	---	None	---	None
		October	3.5-6.0	>6.0	---	---	None	---	None
		November	2.5-5.0	>6.0	---	---	None	---	None
		December	3.0-5.5	>6.0	---	---	None	---	None
798:									
Protivin-----------------	C								
		January	3.0-5.5	>6.0	---	---	None	---	None
		February	2.5-5.0	>6.0	---	---	None	---	None
		March	1.5-4.0	>6.0	---	---	None	---	None
		April	1.0-3.5	>6.0	---	---	None	---	None
		May	1.5-4.0	>6.0	---	---	None	---	None
		June	3.0-5.5	>6.0	---	---	None	---	None
		July	3.0-5.5	>6.0	---	---	None	---	None
		August	3.5-6.0	>6.0	---	---	None	---	None
		September	4.0-6.5	>6.0	---	---	None	---	None
		October	3.5-6.0	>6.0	---	---	None	---	None
		November	2.5-5.0	>6.0	---	---	None	---	None
		December	3.0-5.5	>6.0	---	---	None	---	None
809B:									
Bertram------------------	B								
		Jan-Dec	---	---	---	---	None	---	None
877B:									
Dinsmore-----------------	B								
		January	6.0-6.7	>6.0	---	---	None	---	None
		February	5.5-6.7	>6.0	---	---	None	---	None
		March	4.5-6.5	>6.0	---	---	None	---	None
		April	4.0-6.0	>6.0	---	---	None	---	None
		May	4.5-6.5	>6.0	---	---	None	---	None
		June	5.0-6.7	>6.0	---	---	None	---	None
		July	6.0-6.7	>6.0	---	---	None	---	None
		August	6.5-6.7	>6.0	---	---	None	---	None
		October	6.5-6.7	>6.0	---	---	None	---	None
		November	5.5-6.7	>6.0	---	---	None	---	None
		December	6.0-6.7	>6.0	---	---	None	---	None
884:									
Klingmore----------------	B								
		January	3.0-5.5	>6.0	---	---	None	---	None
		February	2.5-5.0	>6.0	---	---	None	---	None
		March	1.5-4.0	>6.0	---	---	None	---	None
		April	1.0-3.5	>6.0	---	---	None	---	None
		May	1.5-4.0	>6.0	---	---	None	---	None
		June	3.0-5.5	>6.0	---	---	None	---	None
		July	3.0-5.5	>6.0	---	---	None	---	None
		August	3.5-6.0	>6.0	---	---	None	---	None
		September	4.0-6.5	>6.0	---	---	None	---	None
		October	3.5-6.0	>6.0	---	---	None	---	None
		November	2.5-5.0	>6.0	---	---	None	---	None
		December	3.0-5.5	>6.0	---	---	None	---	None

Table 21.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
911B:									
Colo	B/D								
		January	2.0-3.5	>6.0	---	---	None	---	None
		February	1.5-3.0	>6.0	---	---	None	---	None
		March	0.5-2.0	>6.0	---	---	None	---	None
		April	0.0-1.0	>6.0	---	---	None	---	None
		May	0.5-1.5	>6.0	---	---	None	---	None
		June	1.0-2.0	>6.0	---	---	None	---	None
		July	2.0-3.0	>6.0	---	---	None	---	None
		August	2.5-3.5	>6.0	---	---	None	---	None
		September	3.0-4.0	>6.0	---	---	None	---	None
		October	2.5-3.5	>6.0	---	---	None	---	None
		November	1.5-3.0	>6.0	---	---	None	---	None
		December	2.0-3.5	>6.0	---	---	None	---	None
Ely	B								
		January	3.0-5.5	>6.0	---	---	None	---	None
		February	2.5-5.0	>6.0	---	---	None	---	None
		March	1.5-4.0	>6.0	---	---	None	---	None
		April	1.0-3.5	>6.0	---	---	None	---	None
		May	1.5-4.0	>6.0	---	---	None	---	None
		June	3.0-5.5	>6.0	---	---	None	---	None
		July	3.0-5.5	>6.0	---	---	None	---	None
		August	3.5-6.0	>6.0	---	---	None	---	None
		September	4.0-6.5	>6.0	---	---	None	---	None
		October	3.5-6.0	>6.0	---	---	None	---	None
		November	2.5-5.0	>6.0	---	---	None	---	None
		December	3.0-5.5	>6.0	---	---	None	---	None
933:									
Sawmill, occasionally flooded	B/D								
		January	2.0-3.5	>6.0	---	---	None	---	None
		February	1.5-3.0	0.7-6.7	---	---	None	Long	Occasional
		March	0.5-2.0	>6.0	---	---	None	Long	Occasional
		April	0.0-1.0	>6.0	---	---	None	Long	Occasional
		May	0.5-1.5	>6.0	---	---	None	Long	Occasional
		June	1.0-2.0	>6.0	---	---	None	Long	Occasional
		July	2.0-3.0	>6.0	---	---	None	Long	Occasional
		August	2.5-3.5	>6.0	---	---	None	Long	Occasional
		September	3.0-4.0	>6.0	---	---	None	Long	Occasional
		October	2.5-3.5	>6.0	---	---	None	Long	Occasional
		November	1.5-3.0	>6.0	---	---	None	Long	Occasional
		December	2.0-3.5	>6.0	---	---	None	---	None
982:									
Maxmore	B/D								
		January	2.0-3.5	>6.0	---	---	None	---	None
		February	1.5-3.0	>6.0	---	---	None	---	None
		March	0.5-2.0	>6.0	---	---	None	---	None
		April	0.0-1.0	>6.0	---	---	None	---	None
		May	0.5-1.5	>6.0	---	---	None	---	None
		June	1.0-2.0	>6.0	---	---	None	---	None
		July	2.0-3.0	>6.0	---	---	None	---	None
		August	2.5-3.5	>6.0	---	---	None	---	None
		September	3.0-4.0	>6.0	---	---	None	---	None
		October	2.5-3.5	>6.0	---	---	None	---	None
		November	1.5-3.0	>6.0	---	---	None	---	None
		December	2.0-3.5	>6.0	---	---	None	---	None

Table 21.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
1152:									
Marshan, 24 to 40 inches to sand and gravel-------	B/D								
		January	2.0-3.5	>6.0	---	---	None	---	None
		February	1.5-3.0	>6.0	---	---	None	---	None
		March	0.5-2.0	>6.0	---	---	None	---	None
		April	0.0-1.0	>6.0	---	---	None	---	None
		May	0.5-1.5	>6.0	---	---	None	---	None
		June	1.0-2.0	>6.0	---	---	None	---	None
		July	2.0-3.0	>6.0	---	---	None	---	None
		August	2.5-3.5	>6.0	---	---	None	---	None
		September	3.0-4.0	>6.0	---	---	None	---	None
		October	2.5-3.5	>6.0	---	---	None	---	None
		November	1.5-3.0	>6.0	---	---	None	---	None
		December	2.0-3.5	>6.0	---	---	None	---	None
1226:									
Lawler, 24 to 40 inches to sand and gravel----------	B								
		January	3.0-5.5	>6.0	---	---	None	---	None
		February	2.5-5.0	>6.0	---	---	None	---	None
		March	1.5-4.0	>6.0	---	---	None	---	None
		April	1.0-3.5	>6.0	---	---	None	---	None
		May	1.5-4.0	>6.0	---	---	None	---	None
		June	3.0-5.5	>6.0	---	---	None	---	None
		July	3.0-5.5	>6.0	---	---	None	---	None
		August	3.5-6.0	>6.0	---	---	None	---	None
		September	4.0-6.5	>6.0	---	---	None	---	None
		October	3.5-6.0	>6.0	---	---	None	---	None
		November	2.5-5.0	>6.0	---	---	None	---	None
		December	3.0-5.5	>6.0	---	---	None	---	None
1285G:									
Burkhardt-----------------	B								
		Jan-Dec	---	---	---	---	None	---	None
Bassett-------------------	---								
		January	4.0-6.0	>6.0	---	---	None	---	None
		February	3.5-5.5	>6.0	---	---	None	---	None
		March	2.5-4.5	>6.0	---	---	None	---	None
		April	2.0-4.0	>6.0	---	---	None	---	None
		May	2.5-4.5	>6.0	---	---	None	---	None
		June	3.0-5.0	>6.0	---	---	None	---	None
		July	4.0-6.0	>6.0	---	---	None	---	None
		August	4.5-6.5	>6.0	---	---	None	---	None
		September	5.0-6.7	>6.0	---	---	None	---	None
		October	4.5-6.5	>6.0	---	---	None	---	None
		November	3.5-5.5	>6.0	---	---	None	---	None
		December	4.0-6.0	>6.0	---	---	None	---	None
Chelsea-------------------	---								
		Jan-Dec	---	---	---	---	None	---	None

Table 21.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
1585:									
Spillville, frequently flooded	B								
		January	3.0-5.5	>6.0	---	---	None	---	None
		February	2.5-5.0	>6.0	---	---	None	Long	Frequent
		March	1.5-4.0	>6.0	---	---	None	Long	Frequent
		April	1.0-3.5	>6.0	---	---	None	Long	Frequent
		May	1.5-4.0	>6.0	---	---	None	Long	Frequent
		June	2.0-4.5	>6.0	---	---	None	Long	Frequent
		July	3.0-5.5	>6.0	---	---	None	Long	Frequent
		August	3.5-6.0	>6.0	---	---	None	Long	Frequent
		September	4.0-6.5	>6.0	---	---	None	Long	Frequent
		October	3.5-6.0	>6.0	---	---	None	Long	Frequent
		November	2.5-5.0	>6.0	---	---	None	Long	Frequent
		December	3.0-5.5	>6.0	---	---	None	---	None
Coland, frequently flooded	B/D								
		January	2.0-3.5	>6.0	---	---	None	---	None
		February	1.5-3.0	0.7-6.7	---	---	None	Long	Frequent
		March	0.5-2.0	>6.0	---	---	None	Long	Frequent
		April	0.0-1.0	>6.0	---	---	None	Long	Frequent
		May	0.5-1.5	>6.0	---	---	None	Long	Frequent
		June	1.0-2.0	>6.0	---	---	None	Long	Frequent
		July	2.0-3.0	>6.0	---	---	None	Long	Frequent
		August	2.5-3.5	>6.0	---	---	None	Long	Frequent
		September	3.0-4.0	>6.0	---	---	None	Long	Frequent
		October	2.5-3.5	>6.0	---	---	None	Long	Frequent
		November	1.5-3.0	>6.0	---	---	None	Long	Frequent
		December	2.0-3.5	>6.0	---	---	None	---	None
Aquolls, ponded	A/D								
		January	0.0	>6.0	0.7-1.3	Very long	Frequent	---	None
		February	0.0	>6.0	0.7-1.3	Very long	Frequent	---	None
		March	0.0	>6.0	1.2-1.8	Very long	Frequent	---	None
		April	0.0	>6.0	1.7-2.3	Very long	Frequent	---	None
		May	0.0	>6.0	1.7-2.3	Very long	Frequent	---	None
		June	0.0	>6.0	1.2-1.8	Very long	Frequent	---	None
		July	0.0	>6.0	0.7-1.3	Very long	Frequent	---	None
		August	0.0	>6.0	0.2-0.8	Very long	Frequent	---	None
		September	0.0	>6.0	0.2-0.8	Very long	Frequent	---	None
		October	0.0	>6.0	0.2-0.8	Very long	Frequent	---	None
		November	0.0	>6.0	0.7-1.3	Very long	Frequent	---	None
		December	0.0	>6.0	0.7-1.3	Very long	Frequent	---	None
1586:									
Sigglekov, frequently flooded	A								
		January	3.0-5.5	>6.0	---	---	None	---	None
		February	2.5-5.0	>6.0	---	---	None	Long	Frequent
		March	1.5-4.0	>6.0	---	---	None	Long	Frequent
		April	1.0-3.5	>6.0	---	---	None	Long	Frequent
		May	1.5-4.0	>6.0	---	---	None	Long	Frequent
		June	2.0-4.5	>6.0	---	---	None	Long	Frequent
		July	3.0-5.5	>6.0	---	---	None	Long	Frequent
		August	3.5-6.0	>6.0	---	---	None	Long	Frequent
		September	4.0-6.5	>6.0	---	---	None	Long	Frequent
		October	3.5-6.0	>6.0	---	---	None	Long	Frequent
		November	2.5-5.0	>6.0	---	---	None	Long	Frequent
		December	3.0-5.5	>6.0	---	---	None	---	None

Table 21.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
1586:									
Fluvaquents, frequently flooded------------------	B								
		January	2.0-3.5	>6.0	---	---	None	---	None
		February	1.5-3.0	>6.0	---	---	None	Long	Frequent
		March	0.5-2.0	>6.0	---	---	None	Long	Frequent
		April	0.0-1.0	>6.0	---	---	None	Long	Frequent
		May	0.5-1.5	>6.0	---	---	None	Long	Frequent
		June	1.0-2.0	>6.0	---	---	None	Long	Frequent
		July	2.0-3.0	>6.0	---	---	None	Long	Frequent
		August	2.5-3.5	>6.0	---	---	None	Long	Frequent
		September	3.0-4.0	>6.0	---	---	None	Long	Frequent
		October	2.5-3.5	>6.0	---	---	None	Long	Frequent
		November	1.5-3.0	>6.0	---	---	None	Long	Frequent
		December	2.0-3.5	>6.0	---	---	None	---	None
Aquents, ponded-----------	A/D								
		January	0.0	>6.0	0.7-1.3	Very long	Frequent	---	None
		February	0.0	>6.0	0.7-1.3	Very long	Frequent	---	None
		March	0.0	>6.0	1.2-1.8	Very long	Frequent	---	None
		April	0.0	>6.0	1.7-2.3	Very long	Frequent	---	None
		May	0.0	>6.0	1.7-2.3	Very long	Frequent	---	None
		June	0.0	>6.0	1.2-1.8	Very long	Frequent	---	None
		July	0.0	>6.0	0.7-1.3	Very long	Frequent	---	None
		August	0.0	>6.0	0.2-0.8	Very long	Frequent	---	None
		September	0.0	>6.0	0.2-0.8	Very long	Frequent	---	None
		October	0.0	>6.0	0.2-0.8	Very long	Frequent	---	None
		November	0.0	>6.0	0.7-1.3	Very long	Frequent	---	None
		December	0.0	>6.0	0.7-1.3	Very long	Frequent	---	None
4000.									
Urban land									
4007:									
Wiota---------------------	B								
		Jan-Dec	---	---	---	---	None	---	None
Urban land.									
4041:									
Sparta--------------------	A								
		Jan-Dec	---	---	---	---	None	---	None
Urban land.									
4041B:									
Sparta--------------------	A								
		Jan-Dec	---	---	---	---	None	---	None
Urban land.									
4041C:									
Sparta--------------------	A								
		Jan-Dec	---	---	---	---	None	---	None
Urban land.									
4041D:									
Sparta--------------------	A								
		Jan-Dec	---	---	---	---	None	---	None

Table 21.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
4041D:									
Urban land.									
4063B:									
Chelsea	A								
		Jan-Dec	---	---	---	---	None	---	None
Urban land.									
4063C:									
Chelsea	A								
		Jan-Dec	---	---	---	---	None	---	None
Urban land.									
4063D:									
Chelsea	A								
		Jan-Dec	---	---	---	---	None	---	None
Urban land.									
4083B:									
Kenyon	B								
		January	6.0-6.7	>6.0	---	---	None	---	None
		February	5.5-6.7	>6.0	---	---	None	---	None
		March	4.5-6.5	>6.0	---	---	None	---	None
		April	4.0-6.0	>6.0	---	---	None	---	None
		May	4.5-6.5	>6.0	---	---	None	---	None
		June	5.0-6.7	>6.0	---	---	None	---	None
		July	6.0-6.7	>6.0	---	---	None	---	None
		August	6.5-6.7	>6.0	---	---	None	---	None
		October	6.5-6.7	>6.0	---	---	None	---	None
		November	5.5-6.7	>6.0	---	---	None	---	None
		December	6.0-6.7	>6.0	---	---	None	---	None
Urban land.									
4083C:									
Kenyon	B								
		January	6.0-6.7	>6.0	---	---	None	---	None
		February	5.5-6.7	>6.0	---	---	None	---	None
		March	4.5-6.5	>6.0	---	---	None	---	None
		April	4.0-6.0	>6.0	---	---	None	---	None
		May	4.5-6.5	>6.0	---	---	None	---	None
		June	5.0-6.7	>6.0	---	---	None	---	None
		July	6.0-6.7	>6.0	---	---	None	---	None
		August	6.5-6.7	>6.0	---	---	None	---	None
		October	6.5-6.7	>6.0	---	---	None	---	None
		November	5.5-6.7	>6.0	---	---	None	---	None
		December	6.0-6.7	>6.0	---	---	None	---	None
Urban land.									

Table 21.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
4083D:									
Kenyon----------------------	B								
		January	6.0-6.7	>6.0	---	---	None	---	None
		February	5.5-6.7	>6.0	---	---	None	---	None
		March	4.5-6.5	>6.0	---	---	None	---	None
		April	4.0-6.0	>6.0	---	---	None	---	None
		May	4.5-6.5	>6.0	---	---	None	---	None
		June	5.0-6.7	>6.0	---	---	None	---	None
		July	6.0-6.7	>6.0	---	---	None	---	None
		August	6.5-6.7	>6.0	---	---	None	---	None
		October	6.5-6.7	>6.0	---	---	None	---	None
		November	5.5-6.7	>6.0	---	---	None	---	None
		December	6.0-6.7	>6.0	---	---	None	---	None
Urban land.									
4084:									
Clyde-----------------------	B/D								
		January	2.0-3.5	>6.0	---	---	None	---	None
		February	1.5-3.0	>6.0	---	---	None	---	None
		March	0.5-2.0	>6.0	---	---	None	---	None
		April	0.0-1.0	>6.0	---	---	None	---	None
		May	0.5-1.5	>6.0	---	---	None	---	None
		June	1.0-2.0	>6.0	---	---	None	---	None
		July	2.0-3.0	>6.0	---	---	None	---	None
		August	2.5-3.5	>6.0	---	---	None	---	None
		September	3.0-4.0	>6.0	---	---	None	---	None
		October	2.5-3.5	>6.0	---	---	None	---	None
		November	1.5-3.0	>6.0	---	---	None	---	None
		December	2.0-3.5	>6.0	---	---	None	---	None
Urban land.									
4088:									
Nevin-----------------------	B								
		January	3.0-5.5	>6.0	---	---	None	---	None
		February	2.5-5.0	>6.0	---	---	None	---	None
		March	1.5-4.0	>6.0	---	---	None	Brief	Rare
		April	1.0-3.5	>6.0	---	---	None	Brief	Rare
		May	1.5-4.0	>6.0	---	---	None	Brief	Rare
		June	2.0-4.5	>6.0	---	---	None	Brief	Rare
		July	3.0-5.5	>6.0	---	---	None	Brief	Rare
		August	3.5-6.0	>6.0	---	---	None	Brief	Rare
		September	4.0-6.5	>6.0	---	---	None	Brief	Rare
		October	3.5-6.0	>6.0	---	---	None	Brief	Rare
		November	2.5-5.0	>6.0	---	---	None	Brief	Rare
		December	3.0-5.5	>6.0	---	---	None	---	None
Urban land.									

Table 21.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
4133:									
Colo, occasionally flooded	B/D								
		January	2.0-3.5	>6.0	---	---	None	---	None
		February	1.5-3.0	0.7-6.7	---	---	None	Long	Occasional
		March	0.5-2.0	>6.0	---	---	None	Long	Occasional
		April	0.0-1.0	>6.0	---	---	None	Long	Occasional
		May	0.5-1.5	>6.0	---	---	None	Long	Occasional
		June	1.0-2.0	>6.0	---	---	None	Long	Occasional
		July	2.0-3.0	>6.0	---	---	None	Long	Occasional
		August	2.5-3.5	>6.0	---	---	None	Long	Occasional
		September	3.0-4.0	>6.0	---	---	None	Long	Occasional
		October	2.5-3.5	>6.0	---	---	None	Long	Occasional
		November	1.5-3.0	>6.0	---	---	None	Long	Occasional
		December	2.0-3.5	>6.0	---	---	None	---	None
Urban land.									
4135:									
Coland, occasionally flooded	B/D								
		January	2.0-3.5	>6.0	---	---	None	---	None
		February	1.5-3.0	0.7-6.7	---	---	None	Long	Occasional
		March	0.5-2.0	>6.0	---	---	None	Long	Occasional
		April	0.0-1.0	>6.0	---	---	None	Long	Occasional
		May	0.5-1.5	>6.0	---	---	None	Long	Occasional
		June	1.0-2.0	>6.0	---	---	None	Long	Occasional
		July	2.0-3.0	>6.0	---	---	None	Long	Occasional
		August	2.5-3.5	>6.0	---	---	None	Long	Occasional
		September	3.0-4.0	>6.0	---	---	None	Long	Occasional
		October	2.5-3.5	>6.0	---	---	None	Long	Occasional
		November	1.5-3.0	>6.0	---	---	None	Long	Occasional
		December	2.0-3.5	>6.0	---	---	None	---	None
Urban land.									
4152:									
Marshan, 24 to 40 inches to sand and gravel	B/D								
		January	2.0-3.5	>6.0	---	---	None	---	None
		February	1.5-3.0	>6.0	---	---	None	---	None
		March	0.5-2.0	>6.0	---	---	None	---	None
		April	0.0-1.0	>6.0	---	---	None	---	None
		May	0.5-1.5	>6.0	---	---	None	---	None
		June	1.0-2.0	>6.0	---	---	None	---	None
		July	2.0-3.0	>6.0	---	---	None	---	None
		August	2.5-3.5	>6.0	---	---	None	---	None
		September	3.0-4.0	>6.0	---	---	None	---	None
		October	2.5-3.5	>6.0	---	---	None	---	None
		November	1.5-3.0	>6.0	---	---	None	---	None
		December	2.0-3.5	>6.0	---	---	None	---	None
Urban land.									
4159:									
Finchford	A								
		Jan-Dec	---	---	---	---	None	---	None
Urban land.									

Table 21.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
4159C:									
Finchford	A								
		Jan-Dec	---	---	---	---	None	---	None
Urban land.									
4171B:									
Bassett	B								
		January	4.0-6.0	>6.0	---	---	None	---	None
		February	3.5-5.5	>6.0	---	---	None	---	None
		March	2.5-4.5	>6.0	---	---	None	---	None
		April	2.0-4.0	>6.0	---	---	None	---	None
		May	2.5-4.5	>6.0	---	---	None	---	None
		June	3.0-5.0	>6.0	---	---	None	---	None
		July	4.0-6.0	>6.0	---	---	None	---	None
		August	4.5-6.5	>6.0	---	---	None	---	None
		September	5.0-6.7	>6.0	---	---	None	---	None
		October	4.5-6.5	>6.0	---	---	None	---	None
		November	3.5-5.5	>6.0	---	---	None	---	None
		December	4.0-6.0	>6.0	---	---	None	---	None
Urban land.									
4171D:									
Bassett	B								
		January	4.0-6.0	>6.0	---	---	None	---	None
		February	3.5-5.5	>6.0	---	---	None	---	None
		March	2.5-4.5	>6.0	---	---	None	---	None
		April	2.0-4.0	>6.0	---	---	None	---	None
		May	2.5-4.5	>6.0	---	---	None	---	None
		June	3.0-5.0	>6.0	---	---	None	---	None
		July	4.0-6.0	>6.0	---	---	None	---	None
		August	4.5-6.5	>6.0	---	---	None	---	None
		September	5.0-6.7	>6.0	---	---	None	---	None
		October	4.5-6.5	>6.0	---	---	None	---	None
		November	3.5-5.5	>6.0	---	---	None	---	None
		December	4.0-6.0	>6.0	---	---	None	---	None
Urban land.									
4175:									
Dickinson	B								
		Jan-Dec	---	---	---	---	None	---	None
Urban land.									
4175B:									
Dickinson	B								
		Jan-Dec	---	---	---	---	None	---	None
Urban land.									
4177:									
Saude	B								
		Jan-Dec	---	---	---	---	None	---	None
Urban land.									

Table 21.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
4177B:									
Saude	B								
		Jan-Dec	---	---	---	---	None	---	None
Urban land.									
4178:									
Waukee	B								
		Jan-Dec	---	---	---	---	None	---	None
Urban land.									
4184:									
Klinger	B								
		January	3.0-5.5	>6.0	---	---	None	---	None
		February	2.5-5.0	>6.0	---	---	None	---	None
		March	1.5-4.0	>6.0	---	---	None	---	None
		April	1.0-3.5	>6.0	---	---	None	---	None
		May	1.5-4.0	>6.0	---	---	None	---	None
		June	3.0-5.5	>6.0	---	---	None	---	None
		July	3.0-5.5	>6.0	---	---	None	---	None
		August	3.5-6.0	>6.0	---	---	None	---	None
		September	4.0-6.5	>6.0	---	---	None	---	None
		October	3.5-6.0	>6.0	---	---	None	---	None
		November	2.5-5.0	>6.0	---	---	None	---	None
		December	3.0-5.5	>6.0	---	---	None	---	None
Urban land.									
4198B:									
Floyd	B								
		January	3.0-5.5	>6.0	---	---	None	---	None
		February	2.5-5.0	>6.0	---	---	None	---	None
		March	1.5-4.0	>6.0	---	---	None	---	None
		April	1.0-3.5	>6.0	---	---	None	---	None
		May	1.5-4.0	>6.0	---	---	None	---	None
		June	3.0-5.5	>6.0	---	---	None	---	None
		July	3.0-5.5	>6.0	---	---	None	---	None
		August	3.5-6.0	>6.0	---	---	None	---	None
		September	4.0-6.5	>6.0	---	---	None	---	None
		October	3.5-6.0	>6.0	---	---	None	---	None
		November	2.5-5.0	>6.0	---	---	None	---	None
		December	3.0-5.5	>6.0	---	---	None	---	None
Urban land.									
4226:									
Lawler, 24 to 40 inches to sand and gravel	B								
		January	3.0-5.5	>6.0	---	---	None	---	None
		February	2.5-5.0	>6.0	---	---	None	---	None
		March	1.5-4.0	>6.0	---	---	None	---	None
		April	1.0-3.5	>6.0	---	---	None	---	None
		May	1.5-4.0	>6.0	---	---	None	---	None
		June	3.0-5.5	>6.0	---	---	None	---	None
		July	3.0-5.5	>6.0	---	---	None	---	None
		August	3.5-6.0	>6.0	---	---	None	---	None
		September	4.0-6.5	>6.0	---	---	None	---	None
		October	3.5-6.0	>6.0	---	---	None	---	None
		November	2.5-5.0	>6.0	---	---	None	---	None
		December	3.0-5.5	>6.0	---	---	None	---	None

Table 21.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
4226:									
Urban land.									
4284:									
Flagler-------------------	B								
		Jan-Dec	---	---	---	---	None	---	None
Urban land.									
4284B:									
Flagler-------------------	B								
		Jan-Dec	---	---	---	---	None	---	None
Urban land.									
4377B:									
Dinsdale------------------	B								
		January	6.0-6.7	>6.0	---	---	None	---	None
		February	5.5-6.7	>6.0	---	---	None	---	None
		March	4.5-6.5	>6.0	---	---	None	---	None
		April	4.0-6.0	>6.0	---	---	None	---	None
		May	4.5-6.5	>6.0	---	---	None	---	None
		June	5.0-6.7	>6.0	---	---	None	---	None
		July	6.0-6.7	>6.0	---	---	None	---	None
		August	6.5-6.7	>6.0	---	---	None	---	None
		October	6.5-6.7	>6.0	---	---	None	---	None
		November	5.5-6.7	>6.0	---	---	None	---	None
		December	6.0-6.7	>6.0	---	---	None	---	None
Urban land.									
4377C:									
Dinsdale------------------	B								
		January	6.0-6.7	>6.0	---	---	None	---	None
		February	5.5-6.7	>6.0	---	---	None	---	None
		March	4.5-6.5	>6.0	---	---	None	---	None
		April	4.0-6.0	>6.0	---	---	None	---	None
		May	4.5-6.5	>6.0	---	---	None	---	None
		June	5.0-6.7	>6.0	---	---	None	---	None
		July	6.0-6.7	>6.0	---	---	None	---	None
		August	6.5-6.7	>6.0	---	---	None	---	None
		October	6.5-6.7	>6.0	---	---	None	---	None
		November	5.5-6.7	>6.0	---	---	None	---	None
		December	6.0-6.7	>6.0	---	---	None	---	None
Urban land.									
4382:									
Maxfield------------------	B/D								
		January	2.0-3.5	>6.0	---	---	None	---	None
		February	1.5-3.0	>6.0	---	---	None	---	None
		March	0.5-2.0	>6.0	---	---	None	---	None
		April	0.0-1.0	>6.0	---	---	None	---	None
		May	0.5-1.5	>6.0	---	---	None	---	None
		June	1.0-2.0	>6.0	---	---	None	---	None
		July	2.0-3.0	>6.0	---	---	None	---	None
		August	2.5-3.5	>6.0	---	---	None	---	None
		September	3.0-4.0	>6.0	---	---	None	---	None
		October	2.5-3.5	>6.0	---	---	None	---	None
		November	1.5-3.0	>6.0	---	---	None	---	None
		December	2.0-3.5	>6.0	---	---	None	---	None

Table 21.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
4382:									
Urban land.									
4391B:									
Clyde	B/D								
		January	2.0-3.5	>6.0	---	---	None	---	None
		February	1.5-3.0	>6.0	---	---	None	---	None
		March	0.5-2.0	>6.0	---	---	None	---	None
		April	0.0-1.0	>6.0	---	---	None	---	None
		May	0.5-1.5	>6.0	---	---	None	---	None
		June	1.0-2.0	>6.0	---	---	None	---	None
		July	2.0-3.0	>6.0	---	---	None	---	None
		August	2.5-3.5	>6.0	---	---	None	---	None
		September	3.0-4.0	>6.0	---	---	None	---	None
		October	2.5-3.5	>6.0	---	---	None	---	None
		November	1.5-3.0	>6.0	---	---	None	---	None
		December	2.0-3.5	>6.0	---	---	None	---	None
Floyd	B								
		January	3.0-5.5	>6.0	---	---	None	---	None
		February	2.5-5.0	>6.0	---	---	None	---	None
		March	1.5-4.0	>6.0	---	---	None	---	None
		April	1.0-3.5	>6.0	---	---	None	---	None
		May	1.5-4.0	>6.0	---	---	None	---	None
		June	3.0-5.5	>6.0	---	---	None	---	None
		July	3.0-5.5	>6.0	---	---	None	---	None
		August	3.5-6.0	>6.0	---	---	None	---	None
		September	4.0-6.5	>6.0	---	---	None	---	None
		October	3.5-6.0	>6.0	---	---	None	---	None
		November	2.5-5.0	>6.0	---	---	None	---	None
		December	3.0-5.5	>6.0	---	---	None	---	None
Urban land.									
4398:									
Tripoli	B/D								
		January	2.0-3.5	>6.0	---	---	None	---	None
		February	1.5-3.0	>6.0	---	---	None	---	None
		March	0.5-2.0	>6.0	---	---	None	---	None
		April	0.0-1.0	>6.0	---	---	None	---	None
		May	0.5-1.5	>6.0	---	---	None	---	None
		June	1.0-2.0	>6.0	---	---	None	---	None
		July	2.0-3.0	>6.0	---	---	None	---	None
		August	2.5-3.5	>6.0	---	---	None	---	None
		September	3.0-4.0	>6.0	---	---	None	---	None
		October	2.5-3.5	>6.0	---	---	None	---	None
		November	1.5-3.0	>6.0	---	---	None	---	None
		December	2.0-3.5	>6.0	---	---	None	---	None
Urban land.									

Table 21.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
4399:									
Readlyn	B								
		January	3.0-5.5	>6.0	---	---	None	---	None
		February	2.5-5.0	>6.0	---	---	None	---	None
		March	1.5-4.0	>6.0	---	---	None	---	None
		April	1.0-3.5	>6.0	---	---	None	---	None
		May	1.5-4.0	>6.0	---	---	None	---	None
		June	3.0-5.5	>6.0	---	---	None	---	None
		July	3.0-5.5	>6.0	---	---	None	---	None
		August	3.5-6.0	>6.0	---	---	None	---	None
		September	4.0-6.5	>6.0	---	---	None	---	None
		October	3.5-6.0	>6.0	---	---	None	---	None
		November	2.5-5.0	>6.0	---	---	None	---	None
		December	3.0-5.5	>6.0	---	---	None	---	None
Urban land.									
4408B:									
Olin	B								
		Jan-Dec	---	---	---	---	None	---	None
Urban land.									
4408C:									
Olin	B								
		Jan-Dec	---	---	---	---	None	---	None
Urban land.									
4426B:									
Aredale	B								
		Jan-Dec	---	---	---	---	None	---	None
Urban land.									
4426C:									
Aredale	B								
		Jan-Dec	---	---	---	---	None	---	None
Urban land.									
4585:									
Spillville, occasionally flooded	B								
		January	3.0-5.5	>6.0	---	---	None	---	None
		February	2.5-5.0	>6.0	---	---	None	Long	Occasional
		March	1.5-4.0	>6.0	---	---	None	Long	Occasional
		April	1.0-3.5	>6.0	---	---	None	Long	Occasional
		May	1.5-4.0	>6.0	---	---	None	Long	Occasional
		June	2.0-4.5	>6.0	---	---	None	Long	Occasional
		July	3.0-5.5	>6.0	---	---	None	Long	Occasional
		August	3.5-6.0	>6.0	---	---	None	Long	Occasional
		September	4.0-6.5	>6.0	---	---	None	Long	Occasional
		October	3.5-6.0	>6.0	---	---	None	Long	Occasional
		November	2.5-5.0	>6.0	---	---	None	Long	Occasional
		December	3.0-5.5	>6.0	---	---	None	---	None

Table 21.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
4585:									
Coland, occasionally flooded------------------	B/D								
		January	2.0-3.5	>6.0	---	---	None	---	None
		February	1.5-3.0	0.7-6.7	---	---	None	Long	Occasional
		March	0.5-2.0	>6.0	---	---	None	Long	Occasional
		April	0.0-1.0	>6.0	---	---	None	Long	Occasional
		May	0.5-1.5	>6.0	---	---	None	Long	Occasional
		June	1.0-2.0	>6.0	---	---	None	Long	Occasional
		July	2.0-3.0	>6.0	---	---	None	Long	Occasional
		August	2.5-3.5	>6.0	---	---	None	Long	Occasional
		September	3.0-4.0	>6.0	---	---	None	Long	Occasional
		October	2.5-3.5	>6.0	---	---	None	Long	Occasional
		November	1.5-3.0	>6.0	---	---	None	Long	Occasional
		December	2.0-3.5	>6.0	---	---	None	---	None
Urban land.									
4761:									
Franklin------------------	B								
		January	3.0-5.5	>6.0	---	---	None	---	None
		February	2.5-5.0	>6.0	---	---	None	---	None
		March	1.5-4.0	>6.0	---	---	None	---	None
		April	1.0-3.5	>6.0	---	---	None	---	None
		May	1.5-4.0	>6.0	---	---	None	---	None
		June	3.0-5.5	>6.0	---	---	None	---	None
		July	3.0-5.5	>6.0	---	---	None	---	None
		August	3.5-6.0	>6.0	---	---	None	---	None
		September	4.0-6.5	>6.0	---	---	None	---	None
		October	3.5-6.0	>6.0	---	---	None	---	None
		November	2.5-5.0	>6.0	---	---	None	---	None
		December	3.0-5.5	>6.0	---	---	None	---	None
Urban land.									
4771B:									
Waubeek-------------------	B								
		January	6.0-6.7	>6.0	---	---	None	---	None
		February	5.5-6.7	>6.0	---	---	None	---	None
		March	4.5-6.5	>6.0	---	---	None	---	None
		April	4.0-6.0	>6.0	---	---	None	---	None
		May	4.5-6.5	>6.0	---	---	None	---	None
		June	5.0-6.7	>6.0	---	---	None	---	None
		July	6.0-6.7	>6.0	---	---	None	---	None
		August	6.5-6.7	>6.0	---	---	None	---	None
		October	6.5-6.7	>6.0	---	---	None	---	None
		November	5.5-6.7	>6.0	---	---	None	---	None
		December	6.0-6.7	>6.0	---	---	None	---	None
Urban land.									

Table 21.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
4771D:									
Waubeek-------------------	B								
		January	6.0-6.7	>6.0	---	---	None	---	None
		February	5.5-6.7	>6.0	---	---	None	---	None
		March	4.5-6.5	>6.0	---	---	None	---	None
		April	4.0-6.0	>6.0	---	---	None	---	None
		May	4.5-6.5	>6.0	---	---	None	---	None
		June	5.0-6.7	>6.0	---	---	None	---	None
		July	6.0-6.7	>6.0	---	---	None	---	None
		August	6.5-6.7	>6.0	---	---	None	---	None
		October	6.5-6.7	>6.0	---	---	None	---	None
		November	5.5-6.7	>6.0	---	---	None	---	None
		December	6.0-6.7	>6.0	---	---	None	---	None
Urban land.									
4798:									
Protivin------------------	C								
		January	3.0-5.5	>6.0	---	---	None	---	None
		February	2.5-5.0	>6.0	---	---	None	---	None
		March	1.5-4.0	>6.0	---	---	None	---	None
		April	1.0-3.5	>6.0	---	---	None	---	None
		May	1.5-4.0	>6.0	---	---	None	---	None
		June	3.0-5.5	>6.0	---	---	None	---	None
		July	3.0-5.5	>6.0	---	---	None	---	None
		August	3.5-6.0	>6.0	---	---	None	---	None
		September	4.0-6.5	>6.0	---	---	None	---	None
		October	3.5-6.0	>6.0	---	---	None	---	None
		November	2.5-5.0	>6.0	---	---	None	---	None
		December	3.0-5.5	>6.0	---	---	None	---	None
Urban land.									
4911B:									
Colo----------------------	B/D								
		January	2.0-3.5	>6.0	---	---	None	---	None
		February	1.5-3.0	>6.0	---	---	None	Very brief	Frequent
		March	0.5-2.0	>6.0	---	---	None	Very brief	Frequent
		April	0.0-1.0	>6.0	---	---	None	Very brief	Frequent
		May	0.5-1.5	>6.0	---	---	None	Very brief	Frequent
		June	1.0-2.0	>6.0	---	---	None	Very brief	Frequent
		July	2.0-3.0	>6.0	---	---	None	Very brief	Frequent
		August	2.5-3.5	>6.0	---	---	None	Very brief	Frequent
		September	3.0-4.0	>6.0	---	---	None	Very brief	Frequent
		October	2.5-3.5	>6.0	---	---	None	Very brief	Frequent
		November	1.5-3.0	>6.0	---	---	None	Very brief	Frequent
		December	2.0-3.5	>6.0	---	---	None	---	None
Ely-----------------------	B								
		January	3.0-5.5	>6.0	---	---	None	---	None
		February	2.5-5.0	>6.0	---	---	None	---	None
		March	1.5-4.0	>6.0	---	---	None	---	None
		April	1.0-3.5	>6.0	---	---	None	---	None
		May	1.5-4.0	>6.0	---	---	None	---	None
		June	3.0-5.5	>6.0	---	---	None	---	None
		July	3.0-5.5	>6.0	---	---	None	---	None
		August	3.5-6.0	>6.0	---	---	None	---	None
		September	4.0-6.5	>6.0	---	---	None	---	None
		October	3.5-6.0	>6.0	---	---	None	---	None
		November	2.5-5.0	>6.0	---	---	None	---	None
		December	3.0-5.5	>6.0	---	---	None	---	None

Table 21.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
4911B:									
Urban land.									
4933:									
Sawmill, occasionally flooded------------------	B/D								
		January	2.0-3.5	>6.0	---	---	None	---	None
		February	1.5-3.0	0.7-6.7	---	---	None	Long	Occasional
		March	0.5-2.0	>6.0	---	---	None	Long	Occasional
		April	0.0-1.0	>6.0	---	---	None	Long	Occasional
		May	0.5-1.5	>6.0	---	---	None	Long	Occasional
		June	1.0-2.0	>6.0	---	---	None	Long	Occasional
		July	2.0-3.0	>6.0	---	---	None	Long	Occasional
		August	2.5-3.5	>6.0	---	---	None	Long	Occasional
		September	3.0-4.0	>6.0	---	---	None	Long	Occasional
		October	2.5-3.5	>6.0	---	---	None	Long	Occasional
		November	1.5-3.0	>6.0	---	---	None	Long	Occasional
		December	2.0-3.5	>6.0	---	---	None	---	None
Urban land.									
4946:									
Orthents, loamy.									
Urban land.									
5010.									
Pits, sand and gravel									
5030.									
Pits, limestone quarries									
5040.									
Orthents, loamy									
5053:									
Psammaquents, frequently flooded------------------	A/D								
		January	0.0-1.0	>6.0	---	---	None	---	None
		February	0.0-1.0	>6.0	---	---	None	Long	Frequent
		March	0.0-1.0	>6.0	---	---	None	Long	Frequent
		April	0.0-1.0	>6.0	---	---	None	Long	Frequent
		May	0.0-1.0	>6.0	---	---	None	Long	Frequent
		June	0.0-1.0	>6.0	---	---	None	Long	Frequent
		July	0.0-1.0	>6.0	---	---	None	Long	Frequent
		August	---	---	---	---	None	Long	Frequent
		September	---	---	---	---	None	Long	Frequent
		October	---	---	---	---	None	Long	Frequent
		November	0.0-1.0	>6.0	---	---	None	Long	Frequent
		December	0.0-1.0	>6.0	---	---	None	---	None
5080.									
Orthents, sanitary landfill									
AW.									
Animal waste									
SL.									
Sewage lagoon									

Table 21.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
W. Water									

Table 22.--Soil Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
7:									
Wiota	---	>80	---	---	---	---	High	Moderate	Moderate.
41:									
Sparta	---	>80	---	---	---	---	Low	Low	Moderate.
41B:									
Sparta	---	>80	---	---	---	---	Low	Low	Moderate.
41C:									
Sparta	---	>80	---	---	---	---	Low	Low	Moderate.
41D:									
Sparta	---	>80	---	---	---	---	Low	Low	Moderate.
63B:									
Chelsea	---	>80	---	---	---	---	Low	Low	Low.
63C:									
Chelsea	---	>80	---	---	---	---	Low	Low	Low.
63D:									
Chelsea	---	>80	---	---	---	---	Low	Low	Low.
83B:									
Kenyon	---	>80	---	---	---	---	Moderate	Moderate	Moderate.
83C:									
Kenyon	---	>80	---	---	---	---	Moderate	Moderate	Moderate.
83C2:									
Kenyon, moderately eroded	---	>80	---	---	---	---	Moderate	Moderate	Moderate.
83D2:									
Kenyon, moderately eroded	---	>80	---	---	---	---	Moderate	Moderate	Moderate.
84:									
Clyde	---	>80	---	---	---	---	High	High	Low.

Table 22.--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			
88:									
Nevin	---	>80	---	---	---	---	High	High	Low.
133:									
Colo, occasionally flooded	---	>80	---	---	---	---	High	High	Moderate.
135:									
Coland, occasionally flooded	---	>80	---	---	---	---	High	High	Low.
159:									
Finchford	---	>80	---	---	---	---	Low	Low	Low.
159C:									
Finchford	---	>80	---	---	---	---	Low	Low	Low.
171B:									
Bassett	---	>80	---	---	---	---	Moderate	Moderate	Moderate.
175:									
Dickinson	---	>80	---	---	---	---	Moderate	Low	Moderate.
175B:									
Dickinson	---	>80	---	---	---	---	Moderate	Low	Moderate.
177:									
Saude	---	>80	---	---	---	---	Low	Low	Moderate.
177B:									
Saude	---	>80	---	---	---	---	Low	Low	Moderate.
178:									
Waukee	---	>80	---	---	---	---	Low	Low	Moderate.
178B:									
Waukee	---	>80	---	---	---	---	Low	Low	Moderate.
184:									
Klinger	---	>80	---	---	---	---	High	High	Moderate.
198B:									
Floyd	---	>80	---	---	---	---	High	High	Low.

Table 22.--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			
213B:									
Rockton, 30 to 40 inches to limestone	Bedrock (lithic)	30-40	40-50	Strongly cemented	---	---	Moderate	Low	Low.
221:									
Klossner	---	>80	---	---	4-15	25-32	High	High	Moderate.
284:									
Flagler	---	>80	---	---	---	---	Low	Moderate	Low.
284B:									
Flagler	---	>80	---	---	---	---	Low	Moderate	Low.
290:									
Dells	---	>80	---	---	---	---	High	Low	Moderate.
354.									
Aquolls, ponded									
377B:									
Dinsdale	---	>80	---	---	---	---	High	Moderate	Moderate.
377C:									
Dinsdale	---	>80	---	---	---	---	High	Moderate	Moderate.
377C2:									
Dinsdale, moderately eroded	---	>80	---	---	---	---	High	Moderate	Moderate.
382:									
Maxfield	---	>80	---	---	---	---	High	High	Moderate.
391B:									
Clyde	---	>80	---	---	---	---	High	High	Low.
Floyd	---	>80	---	---	---	---	High	High	Low.
395B:									
Marquis	---	>80	---	---	---	---	Moderate	Moderate	Moderate.
398:									
Tripoli	---	>80	---	---	---	---	High	High	Moderate.

Table 22.--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			
399:									
Readlyn------------	---	>80	---	---	---	---	High--------	High--------	Moderate.
408B:									
Olin---------------	---	>80	---	---	---	---	Moderate----	Moderate----	Moderate.
408C:									
Olin---------------	---	>80	---	---	---	---	Moderate----	Moderate----	Moderate.
412C:									
Emeline------------	Bedrock (lithic)	4-12	---	---	---	---	Moderate----	Low---------	Low.
426B:									
Aredale------------	---	>80	---	---	---	---	Moderate----	Moderate----	Moderate.
426C:									
Aredale------------	---	>80	---	---	---	---	Moderate----	Moderate----	Moderate.
426C2:									
Aredale, moderately eroded------------	---	>80	---	---	---	---	Moderate----	Moderate----	Moderate.
468B:									
Dunkerton----------	---	>80	---	---	---	---	Moderate----	Moderate----	Moderate.
468C:									
Dunkerton----------	---	>80	---	---	---	---	Moderate----	Moderate----	Moderate.
471:									
Oran---------------	---	>80	---	---	---	---	High--------	High--------	Moderate.
485:									
Spillville, occasionally flooded-----------	---	>80	---	---	---	---	Moderate----	High--------	Moderate.
585:									
Spillville, occasionally flooded-----------	---	>80	---	---	---	---	Moderate----	High--------	Moderate.
Coland, occasionally flooded-----------	---	>80	---	---	---	---	High--------	High--------	Low.

Table 22.--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			
626:									
Hayfield, 24 to 40 inches to sand and gravel	---	>80	---	---	---	---	High	Low	Moderate.
761:									
Franklin	---	>80	---	---	---	---	High	High	Moderate.
771B:									
Waubeek	---	>80	---	---	---	---	High	Moderate	Moderate.
775B:									
Billett	---	>80	---	---	---	---	Moderate	Low	Moderate.
776C:									
Lilah	---	>80	---	---	---	---	Low	Low	High.
777:									
Wapsie	---	>80	---	---	---	---	Low	Low	Moderate.
781B:									
Lourdes	---	>80	---	---	---	---	High	High	Moderate.
781C2:									
Lourdes, moderately eroded	---	>80	---	---	---	---	High	High	Moderate.
782B:									
Donnan	---	>80	---	---	---	---	High	High	Moderate.
798:									
Protivin	---	>80	---	---	---	---	High	High	Moderate.
809B:									
Bertram	Bedrock (lithic)	20-40	---	---	---	---	Moderate	Low	Moderate.
877B:									
Dinsmore	---	>80	---	---	---	---	High	Moderate	Moderate.
884:									
Klingmore	---	>80	---	---	---	---	High	High	Moderate.
911B:									
Colo	---	>80	---	---	---	---	High	High	Moderate.

Table 22.--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			
911B:									
Ely	---	>80	---	---	---	---	High	High	Moderate.
933:									
Sawmill, occasionally flooded	---	>80	---	---	---	---	High	High	Low.
982:									
Maxmore	---	>80	---	---	---	---	High	High	Moderate.
1152:									
Marshan, 24 to 40 inches to sand and gravel	---	>80	---	---	---	---	High	High	Moderate.
1226:									
Lawler, 24 to 40 inches to sand and gravel	---	>80	---	---	---	---	High	High	Moderate.
1285G:									
Burkhardt	---	>80	---	---	---	---	Low	Low	High.
Bassett	---	>80	---	---	---	---	---	---	---
Chelsea	---	>80	---	---	---	---	---	---	---
1585:									
Spillville, frequently flooded	---	>80	---	---	---	---	Moderate	High	Moderate.
Coland, frequently flooded	---	>80	---	---	---	---	High	High	Low.
Aquolls, ponded.									
1586:									
Sigglekov, frequently flooded	---	>80	---	---	---	---	Low	Low	Moderate.
Fluvaquents, frequently flooded									
Aquents, ponded.									

Table 22.--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			
4000. Urban land									
4007:									
Wiota	---	>80	---	---	---	---	High	Moderate	Moderate.
Urban land.									
4041:									
Sparta	---	>80	---	---	---	---	Low	Low	Moderate.
Urban land.									
4041B:									
Sparta	---	>80	---	---	---	---	Low	Low	Moderate.
Urban land.									
4041C:									
Sparta	---	>80	---	---	---	---	Low	Low	Moderate.
Urban land.									
4041D:									
Sparta	---	>80	---	---	---	---	Low	Low	Moderate.
Urban land.									
4063B:									
Chelsea	---	>80	---	---	---	---	Low	Low	Low.
Urban land.									
4063C:									
Chelsea	---	>80	---	---	---	---	Low	Low	Low.
Urban land.									
4063D:									
Chelsea	---	>80	---	---	---	---	Low	Low	Low.
Urban land.									

Table 22.--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			
4083B:									
Kenyon	---	>80	---	---	---	---	Moderate	Moderate	Moderate.
Urban land.									
4083C:									
Kenyon	---	>80	---	---	---	---	Moderate	Moderate	Moderate.
Urban land.									
4083D:									
Kenyon	---	>80	---	---	---	---	Moderate	Moderate	Moderate.
Urban land.									
4084:									
Clyde	---	>80	---	---	---	---	High	High	Low.
Urban land.									
4088:									
Nevin	---	>80	---	---	---	---	High	High	Low.
Urban land.									
4133:									
Colo, occasionally flooded	---	>80	---	---	---	---	High	High	Moderate.
Urban land.									
4135:									
Coland, occasionally flooded	---	>80	---	---	---	---	High	High	Low.
Urban land.									
4152:									
Marshan, 24 to 40 inches to sand and gravel	---	>80	---	---	---	---	High	High	Moderate.
Urban land.									

Table 22.--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			
4159:									
Finchford----------	---	>80	---	---	---	---	Low---------	Low---------	Low.
Urban land.									
4159C:									
Finchford----------	---	>80	---	---	---	---	Low---------	Low---------	Low.
Urban land.									
4171B:									
Bassett------------	---	>80	---	---	---	---	Moderate----	Moderate----	Moderate.
Urban land.									
4171D:									
Bassett------------	---	>80	---	---	---	---	Moderate----	Moderate----	Moderate.
Urban land.									
4175:									
Dickinson----------	---	>80	---	---	---	---	Moderate----	Low---------	Moderate.
Urban land.									
4175B:									
Dickinson----------	---	>80	---	---	---	---	Moderate----	Low---------	Moderate.
Urban land.									
4177:									
Saude--------------	---	>80	---	---	---	---	Low---------	Low---------	Moderate.
Urban land.									
4177B:									
Saude--------------	---	>80	---	---	---	---	Low---------	Low---------	Moderate.
Urban land.									
4178:									
Waukee-------------	---	>80	---	---	---	---	Low---------	Low---------	Moderate.
Urban land.									

Table 22.--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			
4184:									
Klinger	---	>80	---	---	---	---	High	High	Moderate.
Urban land.									
4198B:									
Floyd	---	>80	---	---	---	---	High	High	Low.
Urban land.									
4226:									
Lawler, 24 to 40 inches to sand and gravel	---	>80	---	---	---	---	High	High	Moderate.
Urban land.									
4284:									
Flagler	---	>80	---	---	---	---	Low	Moderate	Low.
Urban land.									
4284B:									
Flagler	---	>80	---	---	---	---	Low	Moderate	Low.
Urban land.									
4377B:									
Dinsdale	---	>80	---	---	---	---	High	Moderate	Moderate.
Urban land.									
4377C:									
Dinsdale	---	>80	---	---	---	---	High	Moderate	Moderate.
Urban land.									
4382:									
Maxfield	---	>80	---	---	---	---	High	High	Moderate.
Urban land.									
4391B:									
Clyde	---	>80	---	---	---	---	High	High	Low.

Table 22.--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			
4391B:									
Floyd	---	>80	---	---	---	---	High	High	Low.
Urban land.									
4398:									
Tripoli	---	>80	---	---	---	---	High	High	Moderate.
Urban land.									
4399:									
Readlyn	---	>80	---	---	---	---	High	High	Moderate.
Urban land.									
4408B:									
Olin	---	>80	---	---	---	---	Moderate	Moderate	Moderate.
Urban land.									
4408C:									
Olin	---	>80	---	---	---	---	Moderate	Moderate	Moderate.
Urban land.									
4426B:									
Aredale	---	>80	---	---	---	---	Moderate	Moderate	Moderate.
Urban land.									
4426C:									
Aredale	---	>80	---	---	---	---	Moderate	Moderate	Moderate.
Urban land.									
4585:									
Spillville, occasionally flooded	---	>80	---	---	---	---	Moderate	High	Moderate.
Coland, occasionally flooded	---	>80	---	---	---	---	High	High	Low.
Urban land.									

Table 22.--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			
4761:									
Franklin-----------	---	>80	---	---	---	---	High--------	High--------	Moderate.
Urban land.									
4771B:									
Waubeek------------	---	>80	---	---	---	---	High--------	Moderate----	Moderate.
Urban land.									
4771D:									
Waubeek------------	---	>80	---	---	---	---	High--------	Moderate----	Moderate.
Urban land.									
4798:									
Protivin-----------	---	>80	---	---	---	---	High--------	High--------	Moderate.
Urban land.									
4911B:									
Colo---------------	---	>80	---	---	---	---	High--------	High--------	Moderate.
Ely----------------	---	>80	---	---	---	---	High--------	High--------	Moderate.
Urban land.									
4933:									
Sawmill, occasionally flooded-----------	---	>80	---	---	---	---	High--------	High--------	Low.
Urban land.									
4946:									
Orthents, loamy.									
Urban land.									
5010.									
Pits, sand and gravel									

Table 22.--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			
5030. Pits, limestone quarries									
5040. Orthents, loamy									
5053. Psammaquents, frequently flooded									
5080. Orthents, sanitary landfill									
AW. Animal waste									
SL. Sewage lagoon									
W. Water									

Table 23.--Classification of the Soils

Soil name	Family or higher taxonomic class
Aredale	Fine-loamy, mixed, superactive, mesic Typic Hapludolls
Atkinson	Fine-loamy, mixed, superactive, mesic Typic Argiudolls
Bassett	Fine-loamy, mixed, superactive, mesic Oxyaquic Hapludalfs
Bertram	Coarse-loamy, mixed, superactive, mesic Typic Hapludolls
Billett	Coarse-loamy, mixed, superactive, mesic Mollic Hapludalfs
Burkhardt	Sandy, mixed, mesic Typic Hapludolls
Chelsea	Mixed, mesic Lamellic Udipsamments
Clyde	Fine-loamy, mixed, superactive, mesic Typic Endoaquolls
Coland	Fine-loamy, mixed, superactive, mesic Cumulic Endoaquolls
Colo	Fine-silty, mixed, superactive, mesic Cumulic Endoaquolls
Dells	Fine-silty over sandy or sandy-skeletal, mixed, superactive, mesic Aquollic Hapludalfs
Dickinson	Coarse-loamy, mixed, superactive, mesic Typic Hapludolls
Dinsdale	Fine-silty, mixed, superactive, mesic Typic Argiudolls
Dinsmore	Fine-silty, mixed, superactive, mesic Typic Hapludolls
Donnan	Fine-loamy over clayey, mixed, superactive, mesic Aquollic Hapludalfs
Dunkerton	Coarse-loamy, mixed, superactive, mesic Aquollic Hapludalfs
Ely	Fine-silty, mixed, superactive, mesic Aquic Cumulic Hapludolls
Emeline	Loamy, mixed, superactive, mesic Lithic Hapludolls
Finchford	Sandy, mixed, mesic Entic Hapludolls
Flagler	Coarse-loamy, mixed, superactive, mesic Typic Hapludolls
Floyd	Fine-loamy, mixed, superactive, mesic Aquic Hapludolls
Franklin	Fine-silty, mixed, superactive, mesic Udollic Endoaqualfs
Hayfield	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Aquollic Hapludalfs
Kenyon	Fine-loamy, mixed, superactive, mesic Typic Hapludolls
Klinger	Fine-silty, mixed, superactive, mesic Aquic Hapludolls
Klingmore	Fine-silty, mixed, superactive, mesic Aquic Hapludolls
Klossner	Loamy, mixed, euic, mesic Terric Haplosaprists
Lawler	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Aquic Hapludolls
Lilah	Mixed, mesic Psammentic Hapludalfs
Lourdes	Fine-loamy, mixed, superactive, mesic Aquollic Hapludalfs
Marquis	Fine-loamy, mixed, superactive, mesic Oxyaquic Hapludolls
Marshan	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Typic Endoaquolls
Maxfield	Fine-silty, mixed, superactive, mesic Typic Endoaquolls
Maxmore	Fine-silty, mixed, superactive, mesic Typic Endoaquolls
Nevin	Fine-silty, mixed, superactive, mesic Aquic Argiudolls
Olin	Coarse-loamy, mixed, superactive, mesic Typic Hapludolls
Oran	Fine-loamy, mixed, superactive, mesic Aquollic Hapludalfs
Protivin	Fine-loamy, mixed, superactive, mesic Aquic Argiudolls
Readlyn	Fine-loamy, mixed, superactive, mesic Aquic Hapludolls
Riceville	Fine-loamy, mixed, superactive, mesic Udollic Endoaqualfs
Rockton	Fine-loamy, mixed, superactive, mesic Typic Argiudolls
Sattre	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Mollic Hapludalfs
Saude	Coarse-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Typic Hapludolls
Sawmill	Fine-silty, mixed, superactive, mesic Cumulic Endoaquolls
Sigglekov	Sandy, mixed, mesic Aquic Udorthents
Sparta	Sandy, mixed, mesic Entic Hapludolls
Spillville	Fine-loamy, mixed, superactive, mesic Cumulic Hapludolls
Tripoli	Fine-loamy, mixed, superactive, mesic Typic Endoaquolls
Wapsie	Coarse-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Mollic Hapludalfs
Watseka	Sandy, mixed, mesic Aquic Hapludolls
Waubeek	Fine-silty, mixed, superactive, mesic Mollic Hapludalfs
Waukee	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Typic Hapludolls
Wiota	Fine-silty, mixed, superactive, mesic Typic Argiudolls