United States Department of Agriculture

Natural Resources Conservation Service

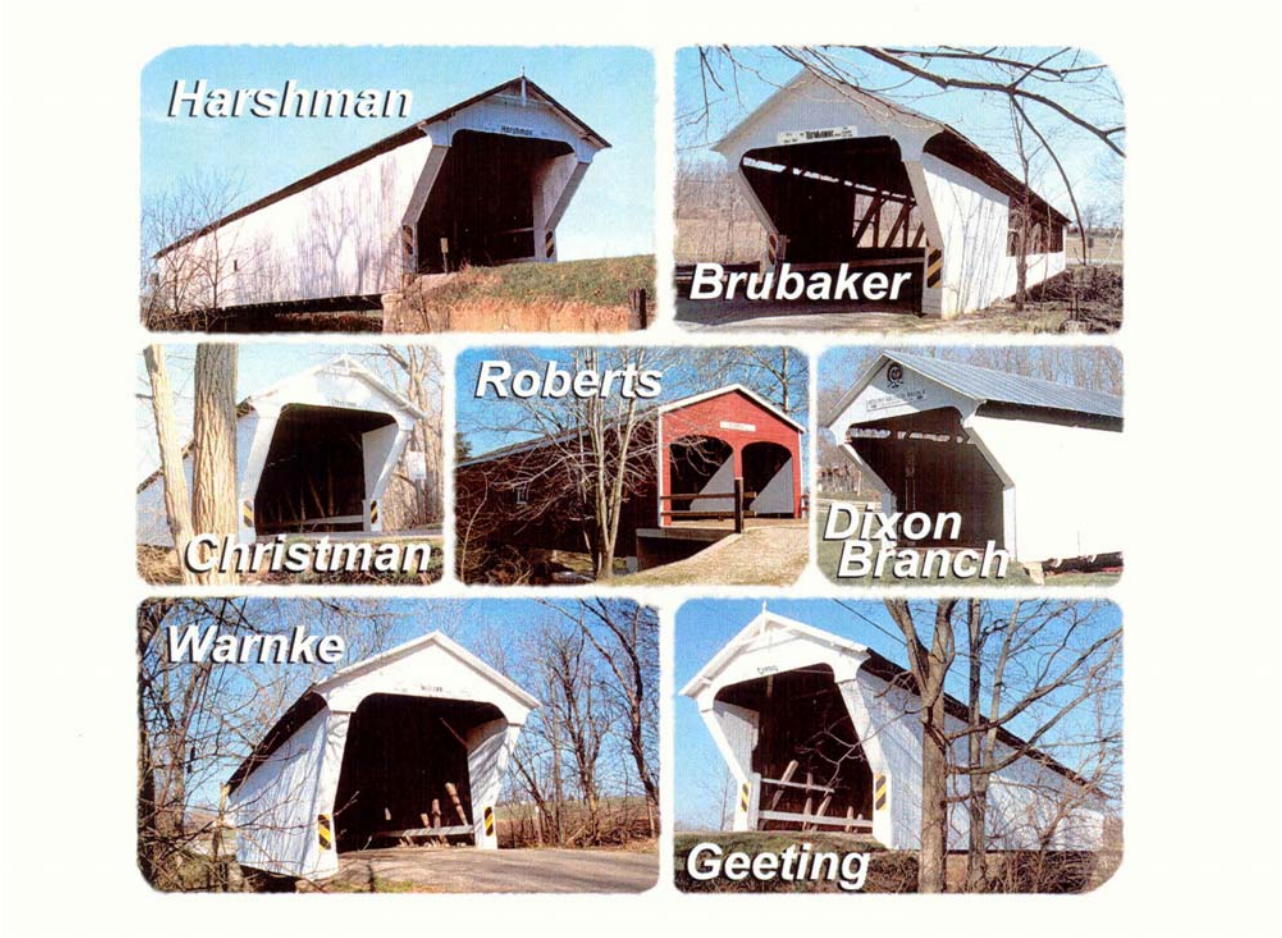
In cooperation with Ohio Department of

Natural Resources,

Division of Soil and Water Conservation; Ohio Agricultural Research and Development Center; Ohio State University Extension; Preble Soil and Water Conservation District; and Preble County Commissioners

Soil Survey of

Preble County, Ohio



Interim Report
May 2005

How to use this survey

General Soil Map

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

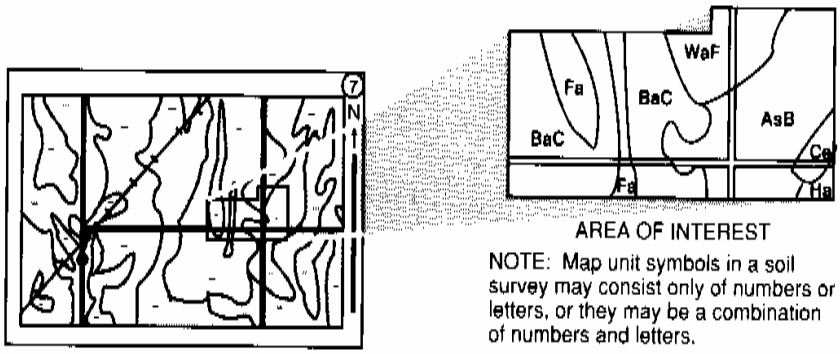
To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** of this survey for a general description of the soils in your area.

Detailed Soil Maps

Detailed soil maps can be generated with geographic information system software from the Natural Resources Conservation Service's Soil Data Mart Website (http://soildatamart.nrcs.usda.gov/). These maps are useful in planning the use and management of small areas.

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

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



MAP SHEET

AREA OF INTEREST

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

This revised 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 2002. Soil names and descriptions were approved in 2004. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 2002. This survey was made cooperatively by the Natural Resources Conservation Service, the Ohio Department of Natural Resources, Division of Soil and Water Conservation; the Ohio Agricultural Research and Development Center; the Ohio State University Extension; the Preble Soil and Water Conservation District; and the Preble County Commissioners. The survey is part of the technical assistance furnished to the Preble Soil and Water Conservation District. The Preble County Board of Commissioners provided financial assistance for the survey.

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

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Cover Preble County is home to seven covered bridges. They are named in order (left to right and top to bottom): Harshman, Brubaker, Christman, Roberts, Dixon Branch, Warnke, and Geeting. Roberts Bridge is the oldest and only remaining “double barreled” covered bridge in the State of Ohio and is one of only six standing in the United States.

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Preface

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

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

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

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

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

Soil Survey of Preble County, Ohio

By John R. Allen and Doug B. Dotson, Natural Resources Conservation Service; Matthew H. Deaton, Stephen J. Hamilton and Terrence E. Lucht, Ohio Department of Natural Resources, Division of Soil and Water Conservation

Fieldwork by John R. Allen and Doug B. Dotson, Natural Resources Conservation Service; Matthew H. Deaton, Stephen J. Hamilton and Terrence E. Lucht, Ohio Department of Natural Resources, Division of Soil and Water Conservation

United States Department of Agriculture, Natural Resources Conservation Service,
in cooperation with the Ohio Department of Natural Resources, Division of Soil and Water Conservation; the Ohio Agricultural Research and Development Center; the Ohio State University Extension; the Preble Soil and Water Conservation District; and the Preble County Commissioners.

Preble County is in the southwestern part of Ohio (fig. 1). Preble County is bordered by Union County, Indiana and Wayne County, Indiana on the west, Butler County on the south, Montgomery County on the east and Darke County on the north. The total area in the county is 272,947 acres, or about 426 square miles.

Figure 1.-Location of Preble County in Ohio.

General Nature of the County

The population of the county in 2000 was 42,337. This was a growth of 2,224 residents or 5.5 percent since 1990. Eaton, the county seat and largest community, is near the center of the county. It had a population of 8,133 in 2000. Some other communities and their population in 2000 were Camden, 2,302; Lewisburg, 1,798; New Paris, 1,623; West Alexandria, 1,395; and Gratis, 934 (75).

Much of Preble County is well suited to agriculture. Corn, wheat, soybeans, and hay are the principal crops. Wetness is a major limitation to the use of many soils in the county. The land becomes more dissected and sloping on terminal moraines and along stream valleys (72,80,81).

Climate

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

Climate Tables are created from climate station Eaton, Ohio.

Thunderstorm days, relative humidity, percent sunshine, and wind information are estimated from First Order station Cincinnati, Ohio.

Table 1 (p.283) gives data on temperature and precipitation for the survey area as recorded at Eaton in the period 1971 to 2000. Table 2 (p.284) shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 (p.284) provides data on the length of the growing season.

In winter, the average temperature is 27.8 degrees F and the average daily minimum temperature is 18.7 degrees. The lowest temperature on record, which occurred at Eaton on January 19, 1994, was -33 degrees. In summer, the average temperature is 70.9 degrees and the average daily maximum temperature is 82.8 degrees. The highest temperature, which occurred at Eaton on July 16, 1988, was 102 degrees.

Growing degree days are shown in Table 1 (p.283). They are equivalent to "heat units". During the month, growing degree days accumulate by the

amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The average annual total precipitation is about 39.58 inches. Of this, about 18.26 inches, or 46 percent, usually falls in May through September. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period of record was 4.28 inches at Eaton on May 18, 1991. Thunderstorms occur on about 42 days each year, and most occur between April and August.

The average seasonal snowfall is 10.0 inches. The greatest snow depth at any one time during the period of record was 20 inches recorded on February 15, 1977. On average, 29 days per year have at least 1 inch of snow on the ground. The heaviest 1-day snowfall on record was 11.0 inches recorded on January 13, 1964.

The average relative humidity in mid-afternoon is about 70 percent in December and 50 percent in April and May. Humidity is higher at night, and the average at dawn is about 75 percent in April and 90 percent in August and September. The sun shines 63 percent of the time in summer and 40 percent in winter. The prevailing wind is from the south in all months. Average wind speed is highest, around 11 miles per hour, from January to April.

History

John Leslie established the first settlement by European immigrants in what is now Preble County along Elk Creek in Gratis Township in 1798. However, there were earlier Indian settlements. Later settlers, mainly from Virginia, Pennsylvania, North Carolina, and Kentucky, moved progressively west and north across the county. By 1803, most of the townships had been settled (79, 86).

Preble County was formed from Montgomery and Butler Counties on March 1, 1808. It was named for Captain Edward Preble who had distinguished himself as a naval commander in the Revolutionary War. William Bruce, proprietor, laid out Eaton, the county seat, in 1806. It was named after General William Eaton, who served in the Revolutionary War (79).

Preble County is home of Fort Saint Clair which was erected in 1791-1792 and includes the graves of Lt. Lowry and others killed by the Indians and Chief Little Turtle. In addition, the county has numerous covered bridges, including Roberts Bridge, built in 1829. Roberts Bridge is the oldest and only remaining “double barreled” covered bridge in the state of Ohio and is one of only six standing in the United States.

Physiography, Relief, and Drainage

Preble County is part of the Central Lowland Province. The land surfaces of Preble County fall into five general divisions: (1) nearly level flood plains and low alluvial terraces of the stream valleys; (2) slightly higher, nearly level to gently undulating benches or outwash deposits of the glacial valleys; (3) rolling to steep valley walls, produced either by stream dissection or constructive morainal deposits; (4) predominantly undulating divides of the general upland level (mainly on the till plains); and (5) recessional or end moraines and kames that protrude above the general upland level. One of these moraines that is unique to Preble County has areas of large glacial rocks at or near the surface. This moraine, called the Farmersville Moraine, extends from the northwest part of the county to near Eaton and angles to the east into Montgomery County (77,79).

In general, the slope pattern is complex in the uplands and uniform and simple along the larger drainageways. Relief ranges from nearly level to steep but the land surface is predominantly undulating. Nearly level areas occur principally on stream flood plains, outwash plains, valley trains and stream terraces, and in upland depressions and flats, particularly on the till plains. Hilly to very steep areas occur most extensively along the valley walls of the major drainageways and in the moraines. The steepest areas are in the southern portion of the county from Hueston Woods State Park in the southwest to near the villages of Gratis and West Elkton in the southeast. Another highly dissected area is near the village of New Paris in the northwest part of the county along or near the Whitewater River.

The highest elevation in the county, about 1,220 feet above sea level, occurs about 5 miles west of Eaton in Jackson Township. The lowest elevation, about 768 feet above sea level, is in the southern portion of the county where the Seven Mile Creek crosses the county line (79).

Most of Preble County drains south-southeast to the Great Miami River. Major streams include Twin Creek in the east; Seven Mile Creek in the central; and Four Mile Creek in the west. The Whitewater River, in the northwest part of the county, drains southwest into Indiana (83).

Glacial Geology

Preble County lies entirely within the glaciated region of Ohio. The entire county is located within the Indiana and Ohio Till Plain (Major Land Resource Area 111) (79).

Two moraines in the county indicate various advances and retreats of the Wisconsinan ice sheet

(fig. 2). The more noticeable moraine has rolling topography and is associated with the Camden Moraine that transects the county from the northwest, near New Paris, to the southeast, near West Elkton. Further east and north is the Farmersville Moraine, which is less visible in topographic differences from the ground moraine, but is characterized by the presence of large boulders and stones. Most of these boulders and stones have been removed from crop fields and used to form fence lines or placed in woodlots.

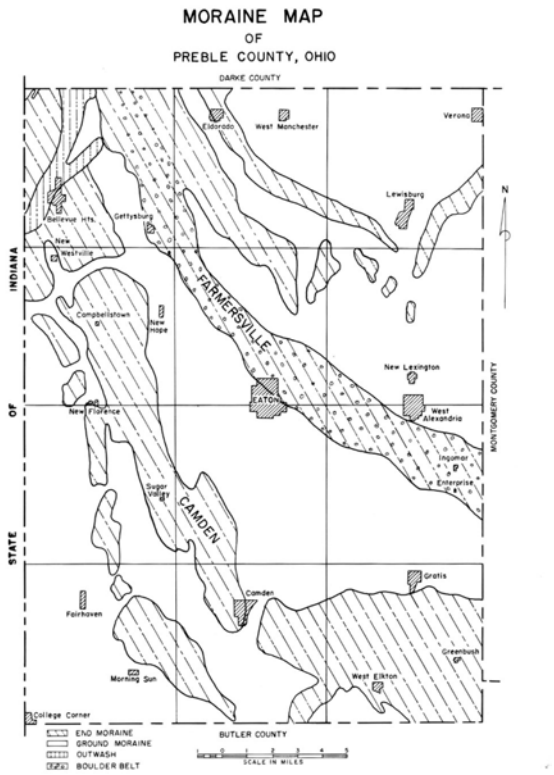


Figure 2. Moraines of Preble County, Ohio.

There are two dominant types of glacial deposits that were left in the county (fig. 3). The first of these is till which consists largely of clay mixed with boulders, gravel, sand, and silt. This unsorted material is deposited directly by glacial ice without subsequent reworking by meltwater. The second type is outwash which consists of stratified sand and gravel, sorted and deposited by running meltwater from the glacial ice. Major outwash areas occur along the Whitewater River as well as the Twin, Seven Mile, and Four Mile Creeks and their tributaries (77).

Most of the western quarter of the county was later covered by wind blown material called loess. The loess had the effect of filling in low areas, resulting in broad, nearly level landscapes interrupted only by a dissected landscape along Four Mile Creek to the southwest. This area is known locally as the "Boston Plains". The soils east of the Camden Moraine generally have little or no loess deposits (78, 85).

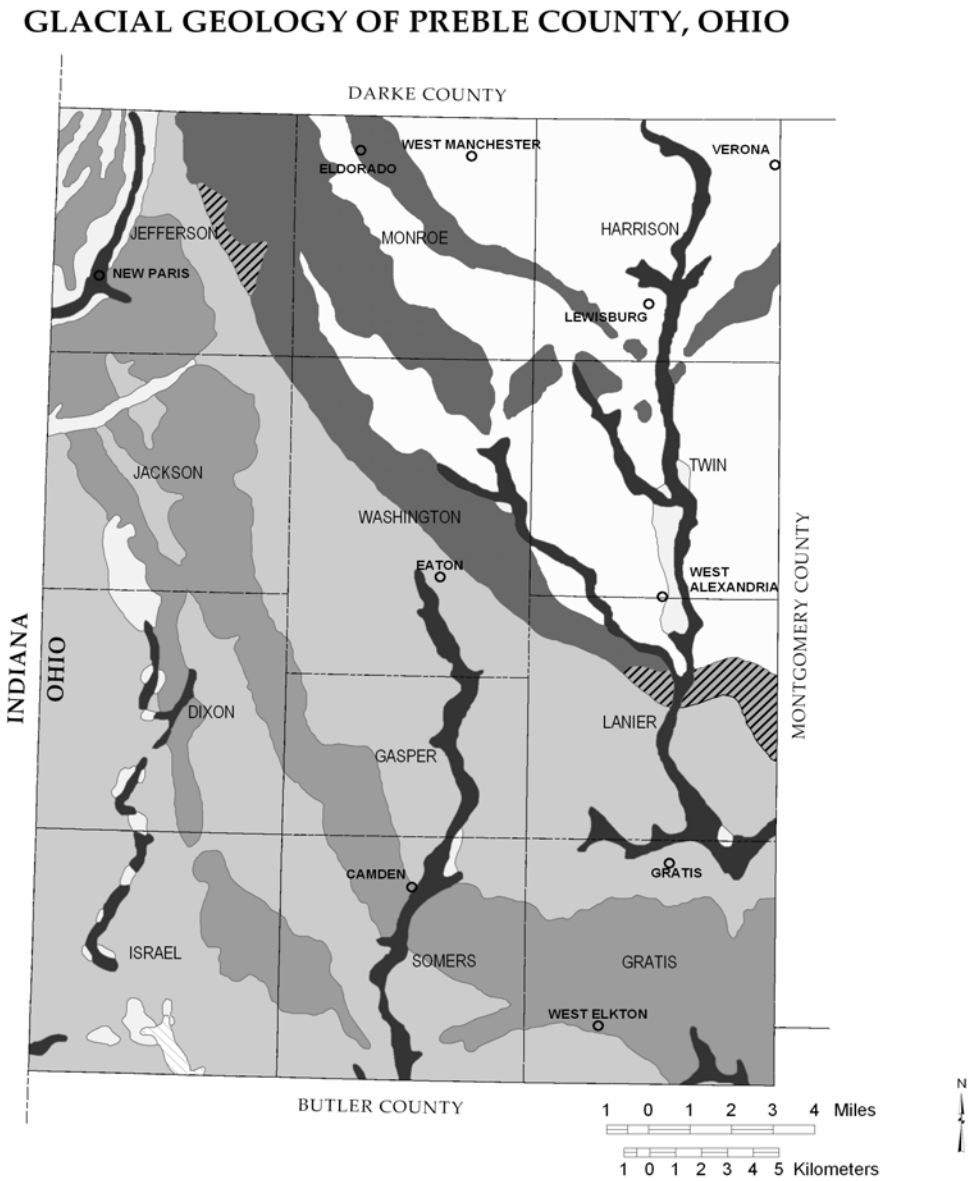
Bedrock Geology

Preble County is covered by a variable thickness of glacial drift. The bedrock is generally at a depth greater than 80 inches. However, the bedrock is shallow along the steep and very steep side slopes of the Four Mile Creek and Seven Mile Creek watersheds to the south. A few areas of exposed bedrock are visible along State Route 127 near the Butler County line and State Route 725 near Camden. Two other areas of shallow bedrock occur along Twin Creek near Lewisburg and just south of West Alexandria. Small, isolated areas of shallow bedrock occur elsewhere (79).

Bedrock in Preble County consists of Silurian Age limestone, and interbedded limestone and calcareous shale of Ordovician age (fig. 4). Soils associated with the Silurian Age limestone include Millsdale, Milton, Plattville, and Randolph. The Ordovician bedrock is mainly found in the southern one third of the county. It is characterized by thin, alternate layers of limestone and soft, calcareous, shale of the Richmond formation. Wynn soils are associated with Ordovician bedrock**.**

The remainder of the county is underlain by dolomitic limestone of the Niagara group of Silurian age. The highly crystalline Brassfield limestone underlies a narrow, irregular strip extending from the southwestern to the northeastern part of the county, also of Silurian age. This limestone lies between the Richmond and Niagara groups (82)..

Figure 3.-Glacial Geology Map of Preble County



EXPLANATION

HOLOCENE (RECENT)-10kA to present

Water

Alluvium and alluvial terraces, deposited in present and former floodplains; ranges from silty clay in areas of fine-grained deposits to coarse sand, gravel, or cobbles in areas of shallow bedrock

LATE WISCONSINAN-23 to 13kA water-deposited units

Outwash, undifferentiated, deposited by meltwater in front of glacial ice; occurs as valley terraces or low plains; sand and gravel, well sorted and stratified.

LATE WISCONSINAN-Late Woodfordian (18 to 14 kA) ice-deposited units

Ground moraine, flat to gently undulating

End moraine, occurs as hummocky ridges higher than adjacent terrain with high concentrations of surface boulders

Ground moraine, flat to gently undulating with high concentrations of surface boulders

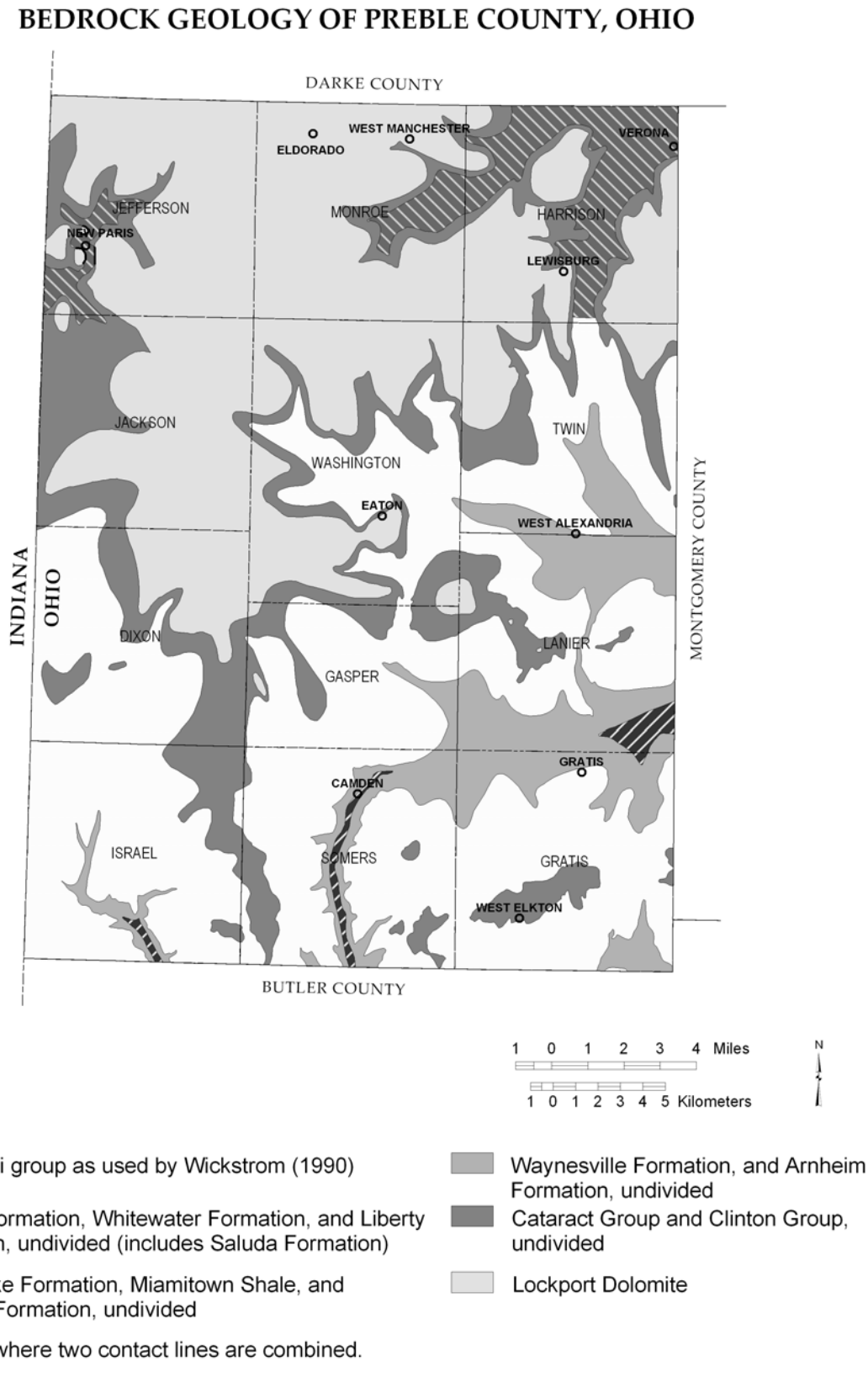
LATE WISCONSINAN-Early Woodfordian (24 to 18 kA) ice-deposited units

Ground moraine, flat to gently undulating

Ground moraine, flat to gently undulating with high concentrations of surface boulders

Source: Pavey,R.R., Goldthwait, R.P., Brockman, C.S., Hull, D.N., Swinford, E.M., and Van Horn, R.G. 1999, Quaternary geology of Ohio: Ohio Department of Natural Resources, Division of Geological Survey Map 1, scale 1:500,000.

Figure 4.-Bedrock Geology Map of Preble County.



Explanation

- Cincinnati group as used by Wickstrom (1990)
- Drakes Formation, Whitewater Formation, and Liberty Formation, undivided (includes Saluda Formation)
- Grant Lake Formation, Miamitown Shale, and Fairview Formation, undivided
- Denotes where two contact lines are combined.
- Waynesville Formation, and Arnheim Formation, undivided
- Cataract Group and Clinton Group, undivided
- Lockport Dolomite

Source: Slucher, E. R., chief compiler, and others, in prep., Bedrock geology of Ohio: Ohio Department of Natural Resources, Division of Geological Survey Map 1, scale 1:500,000.

Transportation

Preble County has a well-developed network of roads, including seven state highways, three U.S. highways, and Interstate Highway 70. Preble County also has several hundred miles of paved county roads. The county is served by one east-west railroad. Air transportation is available at the nearby Greater Dayton Area International Airport, the Richmond Municipal Airport in Richmond, Indiana, the Hamilton Airport in Hamilton, and the Miami University Airfield near Oxford.

How This Survey Was Made

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

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

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

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

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

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

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

The descriptions, names, and delineations of the soils in this survey area do not fully agree with those of the soils in adjacent survey areas. Differences are the result of a better 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.

Soil Survey Procedures

This survey represents an update of the Preble County Soil Survey published in 1969 (79). In 1991, at the request of the Preble County Commissioners, an evaluation of the 1969 survey was undertaken. Several areas were identified for modernization. These included updating and expanding the interpretive tables, recorrelating the survey, updating soil classification and the remapping of a portion of the county.

The evaluation verified the accuracy of the majority of the line work. Primarily, these lines were used as a basis in producing the new maps. Transects were made to determine the validity of the map unit composition before these lines were transferred to the new photo base. In most cases no adjustments or only minor adjustments to soil lines were required.

The general procedures followed in making this survey are described in the National Soil Survey Handbook (64) and the Soil Survey Manual (49) of the Natural Resources Conservation Service.

Before actual fieldwork began, preliminary boundaries of slopes and landforms were studied from the aerial photographs flown in l994 at a scale of 1:12,000. USGS topographic maps enlarged to a scale of 1:12,000 were studied to relate land and image features.

Traverses were made on foot to examine the soils. In most areas, soil examinations along the traverses were made 10 to 50 yards apart. Depending on the size of the units. Observations of such items as landforms, trees blown down, vegetation, roadbanks and animal burrows were made continuously without regard to spacing. Soil boundaries were confirmed or adjusted on the basis of soil examinations, observations and photo interpretation. The soil material was examined with the aid of a hand auger or spade to a depth of about 80 inches or to bedrock if the bedrock was at a depth of less than 80 inches. The pedons described as typical were observed and studied in pits.

Soil mapping changes were recorded on the field sheets from the 1969 Preble County Soil Survey. The drainageways were mapped in the field and from the old field sheets and USGS topographic maps. Cultural features were recorded from visual observations and topographic maps.

Samples for chemical analysis, physical analysis and engineering properties were taken from representative sites of several of the soils in the survey area. The chemical and physical analyses were made by the Soil Characterization Laboratory, The Ohio State University, Columbus, Ohio. The results of the analyses are stored in a computerized data file at the laboratory. The analysis for engineering properties were made by the Ohio Department of Transportation, Division of Highways, Bureau of Testing, Soils and Foundation Section, Columbus, Ohio. The laboratory procedures can be obtained by request from these respective laboratories. The results of laboratory analysis can be obtained from the Soil Characterization Laboratory, The Ohio State University, Columbus, Ohio; the Ohio Department of Natural Resources, Division of Soil and Water Conservation, Columbus, Ohio; and the Natural Resources Conservation Service, State Office, Columbus, Ohio.

General Soil Map Units

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

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

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

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

General Soil Map

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

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

1. Fincastle-Cyclone-Xenia Association

Very deep, nearly level and gently sloping, somewhat poorly drained, poorly drained, and moderately well drained soils formed in loess and the underlying till.

Setting

Landform: Wisconsinan till plains
Slope range: 0 to 6 percent

Composition

Extent of the association: 1 percent of the county
Extent of the soils in the association:
Fincastle soils: 35 percent
Cyclone soils: 30 percent
Xenia soils: 30 percent
Minor soils: 5 percent

Soil Properties and Qualities

Fincastle
Depth class: Very deep
Drainage class: Somewhat poorly drained
Position on the landform: Summits
Parent material: Loess and the underlying till
Surface textural class: Silt loam
Slope: 0 to 2 percent

Cyclone
Depth class: Very deep
Drainage class: Poorly drained
Parent material: Loess and the underlying till
Surface textural class: Silt loam
Slope: 0 to 2 percent

Xenia
Depth class: Very deep
Drainage class: Moderately well drained
Position on the landform: Summits and shoulders
Parent material: Loess and the underlying till
Surface textural class: Silt loam
Slope: 0 to 6 percent

Minor Soils
Miamian soils on shoulders and backslopes

Use and Management
Major uses: Cropland
Management concerns: Ponding, seasonal high water table, compaction, frost action, surface crusting, erosion hazard, groundwater pollution, tilth, slope

2. Xenia-Miamian-Fincastle Association

Very deep, nearly level to steep, moderately well drained, well drained, and somewhat poorly drained soils formed in loess and the underlying till, or entirely in till.

Setting
Landform: Wisconsinan till plains
Slope range: 0 to 50 percent

Composition
Extent of the association: 9 percent of the county
Extent of the soils in the association:
Xenia soils: 40 percent
Miamian soils: 20 percent
Fincastle soils: 15 percent
Minor soils: 25 percent

Soil Properties and Qualities
Xenia
Depth class: Very deep
Drainage class: Moderately well drained
Position on the landform: Summits and shoulders
Parent material: Loess and the underlying till
Surface textural class: Silt loam
Slope: 0 to 6 percent

Miamian
Depth class: Very deep
Drainage class: Well drained
Position on the landform: Summits, shoulders, and backslopes
Parent material: A thin layer of loess and the underlying till, or entirely in till
Surface textural class: Silt loam or clay loam
Slope: 2 to 50 percent

Fincastle
Depth class: Very deep
Drainage class: Somewhat poorly drained
Position on the landform: Summits
Parent material: Loess and the underlying till
Surface textural class: Silt loam
Slope: 0 to 2 percent

Minor Soils
Cyclone soils in depressional areas
Russell soils on summits and shoulders
Eel soils on flood plains
Hennepin soils on backslopes

Use and Management
Major uses: Cropland
Management concerns: Erosion hazard, root restrictive layer, surface crusting, compaction, seasonal high water table, tilth, slope, frost action, available water capacity

3. Cyclone-Sugarvalley-Morningsun Association

Very deep, nearly level and gently sloping, poorly drained, somewhat poorly drained, and moderately well drained soils formed in loess and the underlying till or water modified till.

Setting
Landform: Wisconsinan till plains and ground moraines
Slope range: 0 to 6 percent

Composition
Extent of the association: 2 percent of the county
Extent of the soils in the association (fig. 5):
Cyclone soils: 50 percent
Sugarvalley soils: 30 percent
Morningsun soils: 15 percent
Minor soils: 5 percent

Figure 5. Typical pattern of soils in the Cyclone-Sugarvalley-Morningsun Association. The Cyclone soils are in the low-lying, dark colored areas and the Sugarvalley and Morningsun soils are in the slightly higher-lying, light colored areas.

Soil Properties and Qualities
Cyclone
Depth class: Very deep

Drainage class: Poorly drained
Parent material: Loess and the underlying till
Surface textural class: Silt loam
Slope: 0 to 2 percent

Sugarvalley
Depth class: Very deep
Drainage class: Somewhat poorly drained
Position on the landform: Summits
Parent material: Loess and the underlying water modified till
Surface textural class: Silt loam
Slope: 0 to 2 percent

Morningsun
Depth class: Very deep
Drainage class: Moderately well drained
Position on the landform: Summits
Parent material: Loess and the underlying water modified till
Surface textural class: Silt loam
Slope: 0 to 6 percent

Minor Soils
Xenia soils on summits and shoulders
Fincastle soils on summits

Use and Management
Major uses: Cropland
Management concerns: Compaction, seasonal high water table, ponding, frost action, ground water pollution, surface crusting, erosion hazard, slope, tilth

4. Celina-Miamian-Kokomo Association

Very deep, level to steep, moderately well drained, well drained, and very poorly drained soils formed in loess and the underlying till, entirely in till, or in loamy materials and the underlying till.

Setting
Landform: Wisconsinan till plains
Slope range: 0 to 50 percent

Composition
Extent of the association: 55 percent of the county
Extent of the soils in the association (fig. 6):
Celina soils: 40 percent
Miamian soils: 30 percent
Kokomo soils: 15 percent
Minor soils: 15 percent

Figure 6. Typical pattern of soils in the Celina-Miamian-Kokomo Association. The Celina soils are in the light colored areas in the foreground; the more sloping Miamian soils are in the background; and the Kokomo soils are in the low-lying, dark colored areas in the center.

Soil Properties and Qualities

Celina
Depth class: Very deep
Drainage class: Moderately well drained
Position on the landform: Summits and shoulders
Parent material: A thin layer of loess and the underlying till
Surface textural class: Silt loam
Slope: 0 to 6 percent

Miamian
Depth class: Very deep
Drainage class: Well drained
Position on the landform: Summits, shoulders and backslopes
Parent material: A thin layer of loess and the underlying till, or entirely in till
Surface textural class: Silt loam or clay loam
Slope: 2 to 50 percent

Kokomo
Depth class: Very deep
Drainage class: Very poorly drained
Parent material: Loamy materials and the underlying till
Surface textural class: Silt loam or silty clay loam
Slope: 0 to 1 percent

Minor Soils
Crosby soils on summits
Westland soils on treads
Medway soils on flood plains

Use and Management
Major uses: Cropland
Management concerns: Seasonal high water table, ponding, compaction, surface crusting, available water capacity, erosion hazard, slope, tilth, frost action, root restrictive layer, restricted permeability, ground water pollution

5. Kokomo-Crosby-Celina Association

Very deep, level to gently sloping, very poorly drained, somewhat poorly drained, and moderately well drained soils formed in loamy materials and the underlying till, or in loess and the underlying till.

Setting
Landform: Wisconsinan till plains
Slope range: 0 to 6 percent

Composition
Extent of the association: 21 percent of the county
Extent of the soils in the association (fig. 7):
Kokomo soils: 45 percent
Crosby soils: 25 percent
Celina soils: 20 percent
Minor soils: 10 percent

Figure 7. Typical pattern of soils in the Kokomo-Crosby-Celina Association. The Kokomo soils are in the low-lying, dark colored areas in the foreground; the slightly higher-lying Crosby soils are in the center; and the more sloping Celina soils are in the background.

Soil Properties and Qualities
Kokomo
Depth class: Very deep
Drainage class: Very poorly drained
Parent material: Loamy materials and the underlying till
Surface textural class: Silt loam or silty clay loam
Slope: 0 to 1 percent

Crosby
Depth class: Very deep
Drainage class: Somewhat poorly drained
Position on the landform: Summits
Parent material: A thin layer of loess and the underlying till
Surface textural class: Silt loam
Slope: 0 to 4 percent

Celina
Depth class: Very deep
Drainage class: Moderately well drained
Position on the landform: Summits and shoulders
Parent material: Loess and the underlying till
Surface textural class: Silt loam or clay loam
Slope: 0 to 6 percent

Minor Soils
Miamian soils on summits, shoulders and footslopes
Lewisburg soils on summits and shoulders

Use and Management
Major uses: Cropland
Management concerns: Seasonal high water table, ponding, compaction, ground water pollution, root restrictive layer, surface crusting, erosion hazard, available water capacity, high clay content, restricted permeability, slope, frost action, tilth

6. Miami-Kendallville Association

Very deep, gently sloping to steep, well drained soils formed in loess and the underlying outwash and/or till, or entirely in till.

Setting
Landform: Wisconsinan kames and moraines
Slope range: 2 to 50 percent

Composition
Extent of the association: 2 percent of the county
Extent of the soils in the association:
Miami soils: 65 percent
Kendallville soils: 25 percent
Minor soils: 10 percent

Soil Properties and Qualities
Miami
Depth class: Very deep
Drainage class: Moderately well drained
Position on the landform: Shoulders and backslopes
Parent material: A thin layer of loess and the underlyig till, or entirely in till
Surface textural class: Silt loam or loam

Slope: 2 to 50 percent

Kendallville
Depth class: Very deep
Drainage class: Well drained
Position on the landform: Shoulders and backslopes
Parent material: A thin layer of loess and the underlying outwash and till
Surface textural class: Silt loam or loam
Slope: 6 to 50 percent

Minor Soils
Crosby soils on summits
Eldean soils on shoulders, footslopes and backslopes
Rainsville soils on summits
Rodman soils on backslopes

Use and Management
Major uses: Woodland and pasture
Management concerns: Surface crusting, easily eroded, slope, compaction, root restrictive layer, tilth, available water capacity

7. Eldean-Lippincott Association

Very deep, nearly level to moderately steep, well drained and very poorly drained soils formed in outwash or in silty material and the underlying outwash.

Setting
Landform: Wisconsinan outwash terraces
Slope range: 0 to 18 percent

Composition
Extent of the association: 1 percent of the county
Extent of the soils in the association:
Eldean soils: 40 percent
Lippincott soils: 40 percent
Minor soils: 20 percent

Soil Properties and Qualities
Eldean
Depth class: Very deep
Drainage class: Well drained
Position on the landform: Treads and risers
Parent material: Outwash
Surface textural class: Loam, silt loam, gravelly loam or gravelly clay loam
Slope: 0 to 18 percent

Lippincott
Depth class: Very deep
Drainage class: Very poorly drained
Position on the landform: Treads
Parent material: Silty material and the underlying outwash
Surface textural class: Silty clay loam
Slope: 0 to 2 percent

Minor Soils
Kendallville soils on backslopes
Savona soils on treads
Sloan soils on flood plains

Use and Management
Major uses: Cropland
Management concerns: Ground water pollution, seasonal high water table, ponding, compaction, available water capacity, root restrictive layer, high clay content, frost action, erosion hazard, slope, tilth

8. Eldean-Stonelick-Rossburg Association

Very deep, level to moderately steep, well drained soils formed in outwash or in alluvium.

Setting
Landform: Wisconsinan outwash plains and flood plains
Slope range: 0 to 18 percent

Composition
Extent of the association: 2 percent of the county
Extent of the soils in the association:
Eldean soils: 40 percent
Stonelick soils: 25 percent
Rossburg soils: 20 percent
Minor soils: 15 percent

Soil Properties and Qualities
Eldean
Depth class: Very deep
Drainage class: Well drained
Position on the landform: Treads and risers
Parent material: Outwash
Surface textural class: Loam, silt loam, gravelly loam or gravelly clay loam
Slope: 0 to 18 percent

Stonelick
Depth class: Very deep
Drainage class: Well drained
Position on the landform: Flood plains
Parent material: Alluvium
Surface textural class: Loam
Slope: 0 to 1 percent

Rossburg
Depth class: Very deep
Drainage class: Well drained
Position on the landform: Flood plains

Parent material: Alluvium
Surface textural class: Silt loam
Slope: 0 to 1 percent

Minor Soils

Ockley soils on treads
Sloan soils on flood plains

Use and Management

Major uses: Cropland
Management concerns: Root restrictive layer, erosion hazard, available water capacity, flooding, groundwater pollution, compaction, high clay content, slope, tilth

Detailed Soil Map Units

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

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

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

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

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

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

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

Soils of one series can differ in texture of the surface layer, slope, stoniness, 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, Miamian silt loam, 6 to 12 percent slopes, eroded, is a phase of the Miamian series.

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

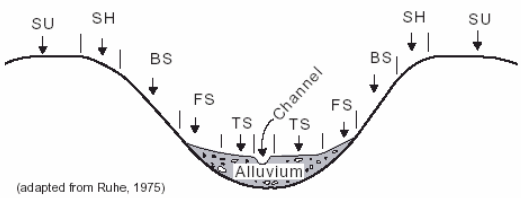
A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are

somewhat similar in all areas. Crosby-Lewisburg silt loams, 0 to 2 percent slopes, is an example.

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

Table 4 (p.285) 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.

Position	Code
summit	SU
shoulder	SH
backslope	BS
footslope	FS
toeslope	TS



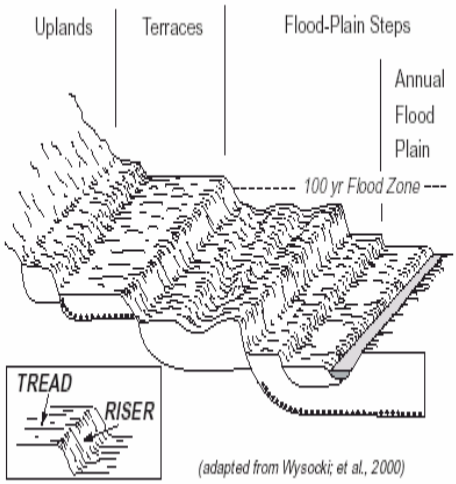


Figure 8. Diagrams showing the relationship between slope position and slope terminology. (Adapted from Ruhle, 1975 and Wysocki 2000)

Figure 8 shows the relationship between different geomorphic slope positions and slope terminology. In areas of low relief in Preble County, slope position terms generally were not used. Refer to the Glossary for more detailed definitions of these landform components (Adapted from Ruhe, 1975 (88) and Wysocki, 2000 (89)).

CeA=Celina silt loam, 0 to 2 percent slopes

Setting
Landform: Flats on the Wisconsinan till plains
Position on the landform: Summits

Map Unit Composition
Celina and similar components: 85 percent

Contrasting Components
Crosby soils: 10 percent
Kokomo soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 6.8 inches to a depth of 36 inches
Cation-exchange capacity of the surface layer: 9.0 to 19 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 20 to 40 inches
Depth to the top of the seasonal high water table: 1.5 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: A thin layer of loess and the underlying till
Permeability: Very slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material.

Pastureland

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

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

CeB=Celina silt loam, 2 to 6 percent slopes

Setting

Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Summits

Map Unit Composition

Celina and similar components: 85 percent

Contrasting Components
Crosby soils: 10 percent
Kokomo soils: 5 percent

Map Unit Interpretive Groups

Land capability classification: 2e
Prime farmland: All areas are prime farmland

Soil Properties and Qualities

Available water capacity: About 7.2 inches to a depth of 38 inches
Cation-exchange capacity of the surface layer: 9.0 to 19 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 20 to 40 inches
Depth to the top of the seasonal high water table: 1.5 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: A thin layer of loess and the underlying till
Permeability: Very slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material.

Pastureland

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

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

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

CeB2=Celina silt loam, 2 to 6 percent slopes, eroded

Setting
Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Shoulders

Map Unit Composition

Celina and similar components: 85 percent

Contrasting Components
Crosby soils: 10 percent
Kokomo soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 5.3 inches to a depth of 28 inches
Cation-exchange capacity of the surface layer: 8.0 to 16 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 20 to 40 inches
Depth to the top of the seasonal high water table: 1.5 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: A thin layer of loess and the underlying till
Permeability: Very slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material.

Pastureland

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

Woodland

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

- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- Burning may destroy organic matter.

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

CoA=Corwin silt loam, 0 to 2 percent slopes

Setting
Landform: Flats on the Wisconsinan till plains
Position on the landform: Summits

Map Unit Composition
Corwin and similar components: 90 percent

Contrasting Components
Kokomo soils: 5 percent
Miamian soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 6.1 inches to a depth of 38 inches
Cation-exchange capacity of the surface layer: 10 to 24 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 20 to 40 inches
Depth to the top of the seasonal high water table: 1.5 to 2.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 4.0 percent
Parent material: A thin layer of loess and the underlying till
Permeability: Slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material.

Pastureland

- This soil is well suited to pasture.

Woodland

- The high content of lime in the upper part of the soil may cause a nutrient imbalance in seedlings.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

CtA=Crosby-Celina silt loams, 0 to 2 percent slopes

Setting
Landform: Flats on the Wisconsinan till plains
Position on the landform: Summits

Map Unit Composition
Crosby and similar components: 60 percent
Celina and similar components: 30 percent

Contrasting Components
Kokomo soils: 10 percent
Map Unit Interpretive Groups

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

Soil Properties and Qualities

CROSBY
Available water capacity: About 5.3 inches to a depth of 39 inches
Cation-exchange capacity of the surface layer: 6.0 to 20 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 20 to 40 inches
Depth to the top of the seasonal high water table: 0.5 to 1.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent

Parent material: A thin layer of loess and the underlying till
Permeability: Very slow or slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.
- The rooting depth of crops is restricted by dense soil material and high clay content.

Pastureland

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

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

Soil Properties and Qualities

CELINA
Available water capacity: About 6.4 inches to a depth of 34 inches
Cation-exchange capacity of the surface layer: 9.0 to 19 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 20 to 40 inches
Depth to the top of the seasonal high water table: 1.5 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: A thin layer of loess and the underlying till
Permeability: Very slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material.

Pastureland

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

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

CtB=Crosby-Celina silt loams, 2 to 4 percent slopes

Setting
Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Summits

Map Unit Composition
Crosby and similar components: 50 percent
Celina and similar components: 40 percent

Contrasting Components
Kokomo soils: 10 percent

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

Soil Properties and Qualities

CROSBY
Available water capacity: About 4.3 inches to a depth of 32 inches
Cation-exchange capacity of the surface layer: 6.0 to 20 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 20 to 40 inches
Depth to the top of the seasonal high water table: 0.5 to 1.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: A thin layer of loess and the underlying till
Permeability: Very slow or slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.
- The rooting depth of crops is restricted by dense soil material and high clay content.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.

- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

Soil Properties and Qualities

CELINA
Available water capacity: About 7.4 inches to a depth of 39 inches
Cation-exchange capacity of the surface layer: 9.0 to 19 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 20 to 40 inches
Depth to the top of the seasonal high water table: 1.5 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: A thin layer of loess and the underlying till
Permeability: Very slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam

Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material.

Pastureland

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

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

CvA=Crosby-Lewisburg silt loams, 0 to 2 percent slopes

Setting
Landform: Flats on the Wisconsinan till plains
Position on the landform: Summits

Map Unit Composition
Crosby and similar components: 60 percent
Lewisburg and similar components: 30 percent

Contrasting Components
Kokomo soils: 10 percent

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

Soil Properties and Qualities

CROSBY
Available water capacity: About 5.2 inches to a depth of 36 inches
Cation-exchange capacity of the surface layer: 6.0 to 20 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 20 to 40 inches
Depth to the top of the seasonal high water table: 0.5 to 1.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: A thin layer of loess and the underlying till
Permeability: Very slow or slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.
- The rooting depth of crops is restricted by dense soil material and high clay content.

Pastureland

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

Woodland

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

Building Sites

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

- In some areas the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

Soil Properties and Qualities

LEWISBURG
Available water capacity: About 3.1 inches to a depth of 19 inches
Cation-exchange capacity of the surface layer: 9.0 to 19 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 10 to 20 inches
Depth to the top of the seasonal high water table: 0.5 to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Basal till
Permeability: Slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.
- The rooting depth of crops is restricted by dense soil material.

Pastureland

- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- The root systems of plants may be damaged by frost action.

Woodland

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

- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

CyA=Cyclone silt loam, 0 to 2 percent slopes

Setting
Landform: Flats and depressions on the Wisconsinan till plains (fig. 9)

Figure 9. Typical setting of Cyclone silt loam, 0 to 2 percent slopes.

Map Unit Composition
Cyclone and similar components: 85 percent

Contrasting Components
Fincastle soils: 5 percent
Xenia soils: 5 percent
Sugarvalley soils: 3 percent
Morningsun soils: 2 percent

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

Soil Properties and Qualities

Available water capacity: About 11.8 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 15 to 27 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 0.0 to 0.5 feet
Water table kind: Apparent
Ponding: Long
Depth of ponding: 0.0 to 0.5 feet
Drainage class: Poorly drained
Flooding: None
Organic matter content in the surface layer: 4.0 to 6.0 percent
Parent material: Loess and the underlying till
Permeability: Moderately slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

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

Pastureland

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

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups
CYCLONE
Pasture and hayland suitability group: C-1
Hydric soil: Yes

DaA=Dana silt loam, 0 to 2 percent slopes

Setting
Landform: Flats on the Wisconsinan till plains
Position on the landform: Summits

Map Unit Composition
Dana and similar components: 90 percent

Contrasting Components
Cyclone soils: 5 percent
Fincastle soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 10.6 inches to a depth of 55 inches
Cation-exchange capacity of the surface layer: 10 to 25 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 40 to 70 inches

Depth to the top of the seasonal high water table: 2.0 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 5.0 percent
Parent material: Loess and the underlying till
Permeability: Slow or moderately slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.

Pastureland

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

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

DaB=Dana silt loam, 2 to 6 percent slopes

Setting

Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Summits

Map Unit Composition
Dana and similar components: 90 percent

Contrasting Components
Cyclone soils: 5 percent
Fincastle soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 10.2 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 10 to 25 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 40 to 70 inches
Depth to the top of the seasonal high water table: 2.0 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 5.0 percent
Parent material: Loess and the underlying till
Permeability: Slow or moderately slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.

Pastureland

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

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

EeA=Eel silt loam, gravelly substratum, 0 to 1 percent slopes, occasionally flooded

Setting
Landform: Flood plains

Map Unit Composition
Eel and similar components: 85 percent

Contrasting Components
Rossburg soils: 5 percent
Sloan soils: 5 percent
Stonelick soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 10.8 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 12 to 20 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 1.5 to 2.0 feet
Water table kind: Apparent
Ponding: None
Drainage class: Moderately well drained
Flooding: Occasional
Organic matter content in the surface layer: 2.0 to 3.0 percent
Parent material: Recent alluvium
Permeability: Moderate in the solum and rapid in the gravelly substratum
Potential frost action: High
Shrink-swell potential: Low
Surface layer texture: Silt loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Measures that protect the soil from scouring and minimize the loss of crop residue by floodwaters are needed.
- Small grain crops may be damaged by flooding in winter and spring.

Pastureland

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

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

- This soil is generally unsuited to septic tank absorption fields. The flooding in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems.

Rapidly moving floodwaters may damage some components of septic systems.

Local Roads and Streets

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

Component Interpretive Groups

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

EgA=Eldean gravelly loam, 0 to 2 percent slopes

Setting
Landform: Wisconsinan outwash terraces
Position on the landform: Treads

Map Unit Composition
Eldean and similar components: 90 percent

Contrasting Components
Ockley soils: 5 percent
Warsaw soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 3.5 inches to a depth of 30 inches
Cation-exchange capacity of the surface layer: 8.0 to 22 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Strongly contrasting textural stratification: 20 to 40 inches
Depth to the top of the seasonal high water table: Greater than 6.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Outwash
Permeability: Moderately slow or moderate in the solum and rapid in the substratum
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Gravelly loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- The rooting depth of crops may be restricted by the high clay content.
- The rooting depth of crops is restricted by soil layers that have strongly contrasting textures.

Pastureland

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

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Rock fragments in the soil obstruct the use of mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building Sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is

reduced in shallow excavations and cutbanks are susceptible to caving.
- This soil is well suited to use as building sites.

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

EgB=Eldean gravelly loam, 2 to 6 percent slopes

Setting
Landform: Wisconsinan outwash terraces
Position on the landform: Treads

Map Unit Composition
Eldean and similar components: 90 percent

Contrasting Components
Ockley soils: 10 percent

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

Soil Properties and Qualities

Available water capacity: About 3.5 inches to a depth of 30 inches
Cation-exchange capacity of the surface layer: 8.0 to 22 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Strongly contrasting textural stratification: 20 to 40 inches
Depth to the top of the seasonal high water table: Greater than 6.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Outwash
Permeability: Moderately slow or moderate in the solum and rapid in the substratum
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Gravelly loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- The rooting depth of crops may be restricted by the high clay content.
- The rooting depth of crops is restricted by soil layers that have strongly contrasting textures.

Pastureland

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

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Rock fragments in the soil obstruct the use of mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building Sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- This soil is well suited to use as building sites.

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

EgB2=Eldean gravelly loam, 2 to 6 percent slopes, eroded

Setting
Landform: Wisconsinan outwash terraces
Position on the landform: Treads

Map Unit Composition
Eldean and similar components: 90 percent

Contrasting Components
Ockley soils: 10 percent

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

Soil Properties and Qualities

Available water capacity: About 3.1 inches to a depth of 26 inches
Cation-exchange capacity of the surface layer: 6.0 to 20 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Strongly contrasting textural stratification: 20 to 40 inches
Depth to the top of the seasonal high water table: Greater than 6.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: Outwash
Permeability: Moderately slow or moderate in the solum and rapid in the substratum
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Gravelly loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.

- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- The rooting depth of crops may be restricted by the high clay content.
- The rooting depth of crops is restricted by soil layers that have strongly contrasting textures.

Pastureland

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

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Rock fragments in the soil obstruct the use of mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Burning may destroy organic matter.

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

EhC3=Eldean gravelly clay loam, 6 to 12 percent slopes, severely eroded

Setting
Landform: Wisconsinan outwash terraces
Position on the landform: Risers

Map Unit Composition
Eldean and similar components: 85 percent

Contrasting Components
Rodman soils: 10 percent
Ockley soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 2.7 inches to a depth of 22 inches
Cation-exchange capacity of the surface layer: 6.0 to 20 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Strongly contrasting textural stratification: 20 to 40 inches
Depth to the top of the seasonal high water table: Greater than 6.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Outwash
Permeability: Moderately slow or moderate in the solum and rapid in the substratum
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Gravelly clay loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by soil layers that have strongly contrasting textures.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

EhD3=Eldean gravelly clay loam, 12 to 18 percent slopes, severely eroded

Setting
Landform: Wisconsinan outwash terraces
Position on the landform: Risers

Map Unit Composition
Eldean and similar components: 85 percent

Contrasting Components
Rodman soils: 10 percent
Ockley soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 4.2 inches to a depth of 35 inches
Cation-exchange capacity of the surface layer: 6.0 to 20 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Strongly contrasting textural stratification: 20 to 40 inches
Depth to the top of the seasonal high water table: Greater than 6.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Outwash
Permeability: Moderately slow or moderate in the solum and rapid in the substratum
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Gravelly clay loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by soil layers that have strongly contrasting textures.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during construction of haul roads and log landings.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- The slope may restrict the use of some mechanical planting equipment.
- Rock fragments in the soil obstruct the use of mechanical planting equipment.
- The slope restricts the use of equipment for preparing this site for planting and seeding.
- Burning may destroy organic matter.

Building Sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- In some areas the high content of clay in the subsurface layer increases the difficulty of

digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

EkA=Eldean loam, 0 to 2 percent slopes

Setting
Landform: Wisconsinan outwash terraces
Position on the landform: Treads

Map Unit Composition
Eldean and similar components: 90 percent

Contrasting Components
Ockley soils: 5 percent
Warsaw soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 4.8 inches to a depth of 36 inches
Cation-exchange capacity of the surface layer: 8.0 to 21 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Strongly contrasting textural stratification: 20 to 40 inches
Depth to the top of the seasonal high water table: Greater than 6.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Outwash
Permeability: Moderately slow or moderate in the solum and rapid in the substratum
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- The rooting depth of crops is restricted by soil layers that have strongly contrasting textures.

Pastureland

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

Woodland

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

Building Sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.
- This soil is well suited to use as building sites.

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

EkB=Eldean loam, 2 to 6 percent slopes

Setting
Landform: Wisconsinan outwash terraces
Position on the landform: Treads

Map Unit Composition
Eldean and similar components: 90 percent

Contrasting Components
Ockley soils: 10 percent

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

Soil Properties and Qualities

Available water capacity: About 4.4 inches to a depth of 34 inches
Cation-exchange capacity of the surface layer: 8.0 to 21 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Strongly contrasting textural stratification: 20 to 40 inches
Depth to the top of the seasonal high water table: Greater than 6.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Outwash

Permeability: Moderately slow or moderate in the solum and rapid in the substratum
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- The rooting depth of crops may be restricted by the high clay content.
- The rooting depth of crops is restricted by soil layers that have strongly contrasting textures.

Pastureland

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

Woodland

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

Building Sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.
- This soil is well suited to use as building sites.

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

EkB2=Eldean loam, 2 to 6 percent slopes, eroded

Setting
Landform: Wisconsinan outwash terraces
Position on the landform: Treads

Map Unit Composition
Eldean and similar components: 90 percent

Contrasting Components
Ockley soils: 10 percent

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

Soil Properties and Qualities

Available water capacity: About 4.0 inches to a depth of 32 inches
Cation-exchange capacity of the surface layer: 6.0 to 20 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Strongly contrasting textural stratification: 20 to 40 inches
Depth to the top of the seasonal high water table: Greater than 6.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: Outwash
Permeability: Moderately slow or moderate in the solum and rapid in the substratum
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by soil layers that have strongly contrasting textures.

Pastureland

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

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Rock fragments in the soil obstruct the use of mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Burning may destroy organic matter.

Building Sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

- This soil is well suited to use as building sites.

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

FcA=Fincastle silt loam, 0 to 2 percent slopes

Setting
Landform: Flats on the Wisconsinan till plains
Position on the landform: Summits

Map Unit Composition
Fincastle and similar components: 95 percent

Contrasting Components
Cyclone soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 8.9 inches to a depth of 46 inches
Cation-exchange capacity of the surface layer: 6.0 to 20 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 40 to 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loess and the underlying till
Permeability: Slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

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

Woodland

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

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

FdA=Fincastle silt loam, bedrock substratum, 0 to 2 percent slopes

Setting
Landform: Flats on the Wisconsinan till plains
Position on the landform: Summits

Map Unit Composition
Fincastle and similar components: 85 percent

Contrasting Components
Wynn soils: 10 percent
Cyclone soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 8.4 inches to a depth of 43 inches
Cation-exchange capacity of the surface layer: 6.0 to 20 meq per 100 grams
Depth class: Deep or very deep
Depth to root restrictive feature: Dense material: 40 to 60 inches
Bedrock (paralithic): 55 to 65 inches
Depth to the top of the seasonal high water table: 0.5 to 1.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loess and the underlying till over limestone and shale
Permeability: Slow in the till substratum and slow to impermeable in the underlying bedrock
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low

Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

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

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

- The limited depth to bedrock reduces the filtering capacity of the soil and greatly increases the difficulty of proper installation of the effluent distribution lines.
- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

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

Component Interpretive Groups

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

FmA=Fox silt loam, till substratum, 0 to 2 percent slopes

Setting
Landform: Wisconsinan outwash terraces
Position on the landform: Treads

Map Unit Composition
Fox and similar components: 90 percent

Contrasting Components
Ockley soils: 5 percent
Westland soils: 5 percent
Map Unit Interpretive Groups

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

Soil Properties and Qualities

Available water capacity: About 6.1 inches to a depth of 37 inches
Cation-exchange capacity of the surface layer: 4.0 to 20 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Strongly contrasting textural stratification: 24 to 40 inches
Depth to the top of the seasonal high water table: Greater than 6.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loamy material over gravelly and very gravelly sandy outwash over till
Permeability: Moderate in the loamy material, rapid or very rapid in the outwash, and slow in the till
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by soil layers that have strongly contrasting textures.

Pastureland

- This soil is well suited to pasture.

Woodland

- The high content of lime in the upper part of the soil may cause a nutrient imbalance in seedlings.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building Sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

FmB=Fox silt loam, till substratum, 2 to 6 percent slopes

Setting
Landform: Wisconsinan outwash terraces
Position on the landform: Treads

Map Unit Composition
Fox and similar components: 90 percent

Contrasting Components
Ockley soils: 5 percent
Westland soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 6.1 inches to a depth of 37 inches
Cation-exchange capacity of the surface layer: 4.0 to 20 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Strongly contrasting textural stratification: 24 to 40 inches
Depth to the top of the seasonal high water table: Greater than 6.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loamy material over gravelly and very gravelly sandy outwash over till
Permeability: Moderate in the loamy material, rapid or very rapid in the outwash, and slow in the till
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by soil layers that have strongly contrasting textures.

Pastureland

Erosion control is needed when pastures are renovated.

Woodland

- The high content of lime in the upper part of the soil may cause a nutrient imbalance in seedlings.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building Sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

FmB2=Fox silt loam, till substratum, 2 to 6 percent slopes, eroded

Setting
Landform: Wisconsinan outwash terraces
Position on the landform: Treads

Map Unit Composition
Fox and similar components: 90 percent

Contrasting Components
Ockley soils: 5 percent
Westland soils: 5 percent

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

Soil Properties and Qualities

- Available water capacity: About 6.2 inches to a depth of 38 inches
- Cation-exchange capacity of the surface layer: 2.0 to 18 meq per 100 grams
- Depth class: Very deep
- Depth to root restrictive feature: Strongly contrasting textural stratification: 24 to 40 inches
- Depth to the top of the seasonal high water table: Greater than 6.0 feet
- Ponding: None
- Drainage class: Well drained
- Flooding: None
- Organic matter content in the surface layer: 0.8 to 2.2 percent
- Parent material: Loamy material over gravelly and very gravelly sandy outwash over till
- Permeability: Moderate in the loamy material, rapid or very rapid in the outwash, and slow in the till
- Potential frost action: Moderate
- Shrink-swell potential: Moderate
- Surface layer texture: Silt loam
- Potential for surface runoff: Low
- Wind erosion hazard: Slight

Use and Management Considerations

Cropland

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

Pastureland

- Erosion control is needed when pastures are renovated.

Woodland

- The high content of lime in the upper part of the soil may cause a nutrient imbalance in seedlings.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- Burning may destroy organic matter.

Building Sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.

- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

HeF2=Hennepin-Miamian silt loams, 25 to 50 percent slopes, eroded

Setting
Landform: Wisconsinan till plains (fig. 10)
Position on the landform: Backslopes

Figure 10. Typical setting of Hennepin-Miamian silt loams, 25 to 50 percent slopes, eroded.

Map Unit Composition
Hennepin and similar components: 55 percent
Miamian and similar components: 45 percent

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

Soil Properties and Qualities

HENNEPIN
Available water capacity: About 2.4 inches to a depth of 16 inches
Cation-exchange capacity of the surface layer: 14 to 20 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 10 to 20 inches
Depth to the top of the seasonal high water table: Greater than 6 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Basal till
Permeability: Slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- This soil is generally not recommended for pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during construction of haul roads and log landings.
- The high content of lime in the upper part of the soil may cause a nutrient imbalance in seedlings.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.

- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The slope creates unsafe operating conditions and reduces the operating efficiency of harvesting and mechanical planting equipment.
- Because of the slope, use of equipment to prepare this site for planting and seeding is not practical.
- Because of the slope, the use of mechanical planting equipment is not practical.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Burning may destroy organic matter.

Building Sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- In some areas the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.

Local Roads and Streets

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

Component Interpretive Groups

HENNEPIN
Pasture and hayland suitability group: A-3
Hydric soil: No

Soil Properties and Qualities

MIAMIAN
Available water capacity: About 5.1 inches to a depth of 29 inches
Cation-exchange capacity of the surface layer: 10 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 20 to 40 inches
Depth to the top of the seasonal high water table: 2.5 to 3.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: A thin layer of loess and the underlying till
Permeability: Slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- This soil is generally not recommended for pasture.

Woodland

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

- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Burning may destroy organic matter.

Building Sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. Special design of structures is needed to prevent damage caused by wetness.
- In some areas the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

MIAMIAN
Pasture and hayland suitability group: A-3
Hydric soil: No

HwE2=Hennepin-Wynn silt loams, 18 to 25 percent slopes, eroded

Setting
Landform: Wisconsinan till plains
Position on the landform: Backslopes (Hennepin soils) and footslopes (Wynn soils)

Map Unit Composition
Hennepin and similar components: 55 percent
Wynn and similar components: 40 percent

Contrasting Components
Miamian soils: 5 percent

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

Soil Properties and Qualities

HENNEPIN
Available water capacity: About 2.4 inches to a depth of 16 inches
Cation-exchange capacity of the surface layer: 14 to 20 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 10 to 20 inches
Depth to the top of the seasonal high water table: Greater than 6 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Basal till
Permeability: Slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.

- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during construction of haul roads and log landings.
- The high content of lime in the upper part of the soil may cause a nutrient imbalance in seedlings.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The slope creates unsafe operating conditions and reduces the operating efficiency of harvesting and mechanical planting equipment.
- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- The slope restricts the use of equipment for preparing this site for planting and seeding.
- Burning may destroy organic matter.

Building Sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- In some areas the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.

Local Roads and Streets

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

Component Interpretive Groups

HENNEPIN
Pasture and hayland suitability group: A-2
Hydric soil: No

Soil Properties and Qualities

WYNN
Available water capacity: About 5.6 inches to a depth of 30 inches
Cation-exchange capacity of the surface layer: 9.0 to 22 meq per 100 grams
Depth class: Moderately deep
Depth to root restrictive feature: Bedrock (paralithic): 20 to 40 inches
Depth to the top of the seasonal high water table: Greater than 2.5 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: A thin layer of loess and the underlying till over limestone and shale
Permeability: Moderately slow in the till and slow to impermeable in the underlying bedrock
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

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

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

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during construction of haul roads and log landings.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Bedrock may interfere with the construction of haul roads and log landing sites.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The slope creates unsafe operating conditions and reduces the operating efficiency of harvesting and mechanical planting equipment.
- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- The slope restricts the use of equipment for preparing this site for planting and seeding.
- Burning may destroy organic matter.

Building Sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The nature and depth of the soft bedrock in this soil reduces the ease of excavation and increases the difficulty in constructing foundations and installing utilities.

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

WYNN
Pasture and hayland suitability group: F-1
Hydric soil: No

HwF2=Hennepin-Wynn silt loams, 25 to 50 percent slopes, eroded

Setting
Landform: Wisconsinan till plains
Position on the landform: Backslopes (Hennepin soils) and footslopes (Wynn soils)

Map Unit Composition
Hennepin and similar components: 55 percent
Wynn and similar components: 40 percent

Contrasting Components
Miamian soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 1.9 inches to a depth of 13 inches

Cation-exchange capacity of the surface layer: 14 to 20 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 10 to 20 inches
Depth to the top of the seasonal high water table: Greater than 6 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Basal till
Permeability: Slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- This soil is generally not recommended for pasture.

Woodland

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

Building Sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- In some areas the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.

Local Roads and Streets

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

Component Interpretive Groups

HENNEPIN
Pasture and hayland suitability group: A-3
Hydric soil: No

Soil Properties and Qualities

WYNN
Available water capacity: About 4.5 inches to a depth of 24 inches
Cation-exchange capacity of the surface layer: 9.0 to 22 meq per 100 grams
Depth class: Moderately deep
Depth to root restrictive feature: Bedrock (paralithic): 20 to 40 inches
Depth to the top of the seasonal high water table: Greater than 2.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent

Parent material: A thin layer of loess and the underlying till over limestone and shale
Permeability: Moderately slow in the till and slow to impermeable in the underlying bedrock
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- This soil is generally not recommended for pasture.

Woodland

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

Building Sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The nature and depth of the soft bedrock in this soil reduces the ease of excavation and increases the difficulty in constructing foundations and installing utilities.

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

WYNN
Pasture and hayland suitability group: F-2
Hydric soil: No

KeC2=Kendallville-Eldean silt loams, 6 to 12 percent slopes, eroded

Setting
Landform: Kames and outwash terraces
Position on the landform: Shoulders and risers

Map Unit Composition
Kendallville and similar components: 60 percent
Eldean and similar components: 30 percent

Contrasting Components
Fox soils: 5 percent
Miamian soils: 5 percent

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

Soil Properties and Qualities

KENDALLVILLE
Available water capacity: About 4.5 inches to a depth of 30 inches
Cation-exchange capacity of the surface layer: 4.0 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 20 to 40 inches
Depth to the top of the seasonal high water table: Greater than 6.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: A thin layer of loess and the underlying outwash and till
Permeability: Moderately slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

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

Building Sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- In some areas the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines and seepage of poorly treated effluent is a concern.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.

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

Component Interpretive Groups

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

Soil Properties and Qualities

ELDEAN
Available water capacity: About 3.3 inches to a depth of 26 inches
Cation-exchange capacity of the surface layer: 8.0 to 21 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Strongly contrasting textural stratification: 20 to 40 inches
Depth to the top of the seasonal high water table: Greater than 6.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: Outwash
Permeability: Moderately slow or moderate in the solum and rapid in the substratum
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by soil layers that have strongly contrasting textures.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

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

Building Sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required. Special

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

KeD2=Kendallville-Eldean silt loams, 12 to 18 percent slopes, eroded

Setting
Landform: Kames and outwash terraces
Position on the landform: Backslopes and risers

Map Unit Composition
Kendallville and similar components: 50 percent
Eldean and similar components: 30 percent

Contrasting Components
Miamian soils: 10 percent
Fox soils: 5 percent
Rodman soils: 5 percent

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

Soil Properties and Qualities

KENDALLVILLE
Available water capacity: About 4.7 inches to a depth of 32 inches
Cation-exchange capacity of the surface layer: 4.0 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 20 to 40 inches
Depth to the top of the seasonal high water table: Greater than 6.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: A thin layer of loess and the underlying outwash and till
Permeability: Moderately slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

- The rooting depth of crops is restricted by dense soil material.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during construction of haul roads and log landings.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The slope may restrict the use of some mechanical planting equipment.
- Rock fragments in the soil obstruct the use of mechanical planting equipment.
- The slope restricts the use of equipment for preparing this site for planting and seeding.
- Burning may destroy organic matter.

Building Sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- In some areas the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.

Local Roads and Streets

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

Component Interpretive Groups

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

Soil Properties and Qualities

ELDEAN
Available water capacity: About 4.0 inches to a depth of 33 inches
Cation-exchange capacity of the surface layer: 8.0 to 21 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Strongly contrasting textural stratification: 20 to 40 inches
Depth to the top of the seasonal high water table: Greater than 6.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: Outwash

Permeability: Moderately slow or moderate in the solum and rapid in the substratum
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by soil layers that have strongly contrasting textures.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during construction of haul roads and log landings.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- The slope restricts the use of equipment for preparing this site for planting and seeding.
- Burning may destroy organic matter.

Building Sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

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

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.

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

Component Interpretive Groups

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

KnA=Kokomo silt loam, 0 to 1 percent slopes

Setting
Landform: Flats and depressions on the Wisconsinan till plains

Map Unit Composition
Kokomo and similar components: 90 percent

Contrasting Components
Celina soils: 5 percent
Crosby soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 11.7 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 14 to 29 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 0.0 to 0.5 feet
Water table kind: Apparent
Ponding: Long
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 6.0 percent
Parent material: Loamy materials and the underlying till
Permeability: Slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

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

Pastureland

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

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

KoA=Kokomo silty clay loam, 0 to 1 percent slopes

Setting
Landform: Flats and depressions on the Wisconsinan till plains

Map Unit Composition
Kokomo and similar components: 90 percent

Contrasting Components
Celina soils: 5 percent
Crosby soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 11.3 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 16 to 33 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 0.0 to 0.5 feet
Water table kind: Apparent
Ponding: Long
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 6.0 percent
Parent material: Loamy materials and the underlying till
Permeability: Slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silty clay loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

The root system of winter grain crops may be damaged by frost action.
Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
Controlling traffic can minimize soil compaction.
Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
A combination of surface and subsurface drainage helps to remove excess water (fig. 11).

Figure 11. Ponding in an area of Kokomo silty clay loam, 0 to 1 percent slopes.

Pastureland

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

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

LeB=Lewisburg-Celina silt loams, 2 to 6 percent slopes

Setting
Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Summits

Map Unit Composition
Lewisburg and similar components: 50 percent
Celina and similar components: 40 percent

Contrasting Components
Crosby soils: 5 percent
Kokomo soils: 5 percent

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

Soil Properties and Qualities

LEWISBURG
Available water capacity: About 3.3 inches to a depth of 19 inches
Cation-exchange capacity of the surface layer: 8.0 to 19 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 10 to 20 inches
Depth to the top of the seasonal high water table: 0.5 to 2.0 feet

Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Basal till
Permeability: Slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.
- The rooting depth of crops is restricted by dense soil material.

Pastureland

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

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

Soil Properties and Qualities

CELINA
Available water capacity: About 6.5 inches to a depth of 34 inches
Cation-exchange capacity of the surface layer: 9.0 to 19 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 20 to 40 inches
Depth to the top of the seasonal high water table: 1.5 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: A thin layer of loess and the underlying till
Permeability: Very slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material.

Pastureland

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

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.

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

Component Interpretive Groups

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

LfB2=Lewisburg-Celina clay loams, 2 to 6 percent slopes, eroded

Setting
Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Shoulders

Map Unit Composition
Lewisburg and similar components: 70 percent
Celina and similar components: 20 percent

Contrasting Components
Crosby soils: 5 percent
Kokomo soils: 5 percent

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

Soil Properties and Qualities

LEWISBURG
Available water capacity: About 3.1 inches to a depth of 19 inches
Cation-exchange capacity of the surface layer: 7.0 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 10 to 20 inches
Depth to the top of the seasonal high water table: 0.5 to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: Basal till
Permeability: Slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Clay loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.
- The rooting depth of crops is restricted by dense soil material.

Pastureland

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

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- Burning may destroy organic matter.

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

Soil Properties and Qualities

CELINA
Available water capacity: About 5.7 inches to a depth of 30 inches
Cation-exchange capacity of the surface layer: 8.0 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 20 to 40 inches
Depth to the top of the seasonal high water table: 1.5 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: Till
Permeability: Very slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Clay loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent

crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material.

Pastureland

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

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

LgC3=Lewisburg clay loam, 6 to 12 percent slopes, severely eroded

Setting
Landform: Wisconsinan till plains
Position on the landform: Shoulders

Map Unit Composition
Lewisburg and similar components: 90 percent

Contrasting Components
Celina soils: 5 percent
Miamian soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 2.9 inches to a depth of 19 inches

Cation-exchange capacity of the surface layer: 7.0 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 10 to 20 inches
Depth to the top of the seasonal high water table: 0.5 to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Basal till
Permeability: Slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Clay loam
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.
- The rooting depth of crops is restricted by dense soil material.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- The root systems of plants may be damaged by frost action.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- Burning may destroy organic matter.

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

LpA=Lippincott silty clay loam, 0 to 2 percent slopes

Setting
Landform: Depressions on Wisconsinan outwash terraces
Position on the landform: Treads

Map Unit Composition
Lippincott and similar components: 80 percent

Contrasting Components
Savona soils: 10 percent
Westland soils: 10 percent

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

Soil Properties and Qualities

Available water capacity: About 5.1 inches to a depth of 36 inches
Cation-exchange capacity of the surface layer: 20 to 40 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Strongly contrasting textural stratification: 20 to 40 inches
Depth to the top of the seasonal high water table: 0.0 to 0.5 feet
Water table kind: Apparent
Ponding: Long
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 4.0 to 8.0 percent
Parent material: Silty material and the underlying outwash high in limestone gravel and sand
Permeability: Moderate in the silty material and rapid in the outwash
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silty clay loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

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

Pastureland

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

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

MaA=Medway silt loam, 0 to 1 percent slopes, occasionally flooded

Setting
Landform: Flood plains

Map Unit Composition
Medway and similar components: 95 percent

Contrasting Components
Sloan soils: 5 percent
Map Unit Interpretive Groups

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

Soil Properties and Qualities

Available water capacity: About 9.4 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 13 to 28 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches

Depth to the top of the seasonal high water table: 2.0 to 3.0 feet
Water table kind: Apparent
Ponding: None
Drainage class: Moderately well drained
Flooding: Occasional
Organic matter content in the surface layer: 3.0 to 6.0 percent
Parent material: Loamy alluvium
Permeability: Moderate
Potential frost action: High
Shrink-swell potential: Low
Surface layer texture: Silt loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Controlling traffic can minimize soil compaction.
- Measures that protect the soil from scouring and minimize the loss of crop residue by floodwaters are needed.
- Small grain crops may be damaged by flooding in winter and spring.

Pastureland

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

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

MbB2=Miami silt loam, 2 to 6 percent slopes, eroded

Setting
Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Shoulders

Map Unit Composition
Miami and similar components: 85 percent

Contrasting Components
Celina soils: 10 percent
Crosby soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 4.5 inches to a depth of 30 inches
Cation-exchange capacity of the surface layer: 6.0 to 17 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 24 to 40 inches
Depth to the top of the seasonal high water table: 2.0 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 2.0 percent
Parent material: A thin layer of loess and the underlying till
Permeability: Very slow or slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material.

Pastureland

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

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

McE2=Miami-Kendallville silt loams, 18 to 25 percent slopes, eroded

Setting
Landform: Kames
Position on the landform: Backslopes

Map Unit Composition
Miami and similar components: 55 percent
Kendallville and similar components: 40 percent

Contrasting Components
Miamian soils: 5 percent

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

Soil Properties and Qualities

MIAMI
Available water capacity: About 4.6 inches to a depth of 31 inches
Cation-exchange capacity of the surface layer: 6.0 to 17 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 24 to 40 inches
Depth to the top of the seasonal high water table: 2.0 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 2.0 percent
Parent material: A thin layer of loess and the underlying till
Permeability: Very slow or slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during construction of haul roads and log landings.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- The slope creates unsafe operating conditions and reduces the operating efficiency of harvesting and mechanical planting equipment.
- The slope may restrict the use of some mechanical planting equipment.
- The slope restricts the use of equipment for preparing this site for planting and seeding.
- Burning may destroy organic matter.

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

Soil Properties and Qualities

KENDALLVILLE
Available water capacity: About 4.7 inches to a depth of 31 inches
Cation-exchange capacity of the surface layer: 4.0 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 20 to 40 inches
Depth to the top of the seasonal high water table: Greater than 6.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: A thin layer of loess and the underlying outwash and till
Permeability: Moderately slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during construction of haul roads and log landings.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.

- The low strength of the soil increases the cost of constructing haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The slope creates unsafe operating conditions and reduces the operating efficiency of harvesting and mechanical planting equipment.
- The slope may restrict the use of some mechanical planting equipment.
- Rock fragments in the soil obstruct the use of mechanical planting equipment.
- The slope restricts the use of equipment for preparing this site for planting and seeding.

Building Sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- In some areas the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.

Local Roads and Streets

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

Component Interpretive Groups

KENDALLVILLE
Pasture and hayland suitability group: A-2
Hydric soil: No

McF2=Miami-Kendallville silt loams, 25 to 50 percent slopes, eroded

Setting
Landform: Kames
Position on the landform: Backslopes

Map Unit Composition
Miami and similar components: 50 percent
Kendallville and similar components: 40 percent

Contrasting Components
Miamian soils: 10 percent

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

Soil Properties and Qualities

MIAMI
Available water capacity: About 4.3 inches to a depth of 28 inches
Cation-exchange capacity of the surface layer: 6.0 to 17 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 24 to 40 inches
Depth to the top of the seasonal high water table: 2.0 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 2.0 percent
Parent material: A thin layer of loess and the underlying till
Permeability: Very slow or slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- This soil is generally not recommended for pasture.

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

MIAMI
Pasture and hayland suitability group: B-2
Hydric soil: No

Soil Properties and Qualities

KENDALLVILLE
Available water capacity: About 5.9 inches to a depth of 40 inches
Cation-exchange capacity of the surface layer: 4.0 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 20 to 43 inches
Depth to the top of the seasonal high water table: Greater than 6.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: A thin layer of loess and the underlying outwash and till
Permeability: Moderately slow
Potential frost action: Moderate

Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- This soil is generally not recommended for pasture.

Woodland

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

Building Sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- In some areas the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.

Local Roads and Streets

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

Component Interpretive Groups

KENDALLVILLE
Pasture and hayland suitability group: A-3
Hydric soil: No

MdC2=Miami loam, 6 to 12 percent slopes, eroded

Setting
Landform: Kames (fig. 12)
Position on the landform: Shoulders

Figure 12. Typical setting of Miami loam, 6 to 12 percent slopes, eroded.

Map Unit Composition
Miami and similar components: 95 percent

Contrasting Components
Celina soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 3.9 inches to a depth of 26 inches
Cation-exchange capacity of the surface layer: 6.0 to 17 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 24 to 40 inches
Depth to the top of the seasonal high water table: 2.0 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 2.0 percent
Parent material: Till
Permeability: Very slow or slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

MdD2=Miami loam, 12 to 18 percent slopes, eroded

Setting
Landform: Kames
Position on the landform: Backslopes

Map Unit Composition
Miami and similar components: 95 percent

Contrasting Components
Celina soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 4.5 inches to a depth of 30 inches
Cation-exchange capacity of the surface layer: 6.0 to 17 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 24 to 40 inches
Depth to the top of the seasonal high water table: 2.0 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 2.0 percent
Parent material: Till
Permeability: Very slow or slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during construction of haul roads and log landings.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The slope may restrict the use of some mechanical planting equipment.
- The slope restricts the use of equipment for preparing this site for planting and seeding.
- Burning may destroy organic matter.

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

MeC=Miamian silt loam, 6 to 12 percent slopes

Setting
Landform: Wisconsinan till plains
Position on the landform: Shoulders

Map Unit Composition
Miamian and similar components: 85 percent

Contrasting Components
Celina soils: 10 percent
Losantville soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 4.3 inches to a depth of 24 inches
Cation-exchange capacity of the surface layer: 10 to 18 meq per 100 grams

Depth class: Very deep
Depth to root restrictive feature: Dense material: 20 to 40 inches
Depth to the top of the seasonal high water table: 2.5 to 3.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: A thin layer of loess and the underlying till
Permeability: Slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material and high clay content.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

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

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. Special design of structures is needed to prevent damage caused by wetness.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- In some areas the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

MeC2=Miamian silt loam, 6 to 12 percent slopes, eroded

Setting
Landform: Wisconsinan till plains
Position on the landform: Shoulders

Map Unit Composition
Miamian and similar components: 85 percent

Contrasting Components
Celina soils: 10 percent
Losantville soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 5.1 inches to a depth of 29 inches
Cation-exchange capacity of the surface layer: 9.0 to 17 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 20 to 40 inches
Depth to the top of the seasonal high water table: 2.5 to 3.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: A thin layer of loess and the underlying till
Permeability: Slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage (fig. 13).
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material and high clay content.

Figure 13. Erosion in an area of Miamian silt loam, 6 to 12 percent slopes, eroded.

Pastureland

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

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

Woodland

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

Building Sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. Special design of structures is needed to prevent damage caused by wetness.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- In some areas the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

MeD2=Miamian silt loam, 12 to 18 percent slopes, eroded

Setting
Landform: Wisconsinan till plains
Position on the landform: Backslopes

Map Unit Composition
Miamian and similar components: 85 percent

Contrasting Components
Losantville soils: 10 percent
Celina soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 5.0 inches to a depth of 27 inches
Cation-exchange capacity of the surface layer: 9.0 to 17 meq per 100 grams

Depth class: Very deep
Depth to root restrictive feature: Dense material: 20 to 40 inches
Depth to the top of the seasonal high water table: 2.5 to 3.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: A thin layer of loess and the underlying till
Permeability: Slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material and high clay content.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during construction of haul roads and log landings.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- The slope restricts the use of equipment for preparing this site for planting and seeding.
- Burning may destroy organic matter.

Building Sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. Special design of structures is needed to prevent damage caused by wetness.
- In some areas the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

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

Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

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

Component Interpretive Groups

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

MfB=Miamian-Celina silt loams, 2 to 6 percent slopes

Setting
Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Summits

Map Unit Composition
Miamian and similar components: 60 percent
Celina and similar components: 30 percent

Contrasting Components
Crosby soils: 5 percent
Kokomo soils: 5 percent

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

Soil Properties and Qualities

MIAMIAN
Available water capacity: About 6.5 inches to a depth of 35 inches
Cation-exchange capacity of the surface layer: 10 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 20 to 40 inches
Depth to the top of the seasonal high water table: 2.5 to 3.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: A thin layer of loess and the underlying till
Permeability: Slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material.

Pastureland

- Erosion control is needed when pastures are renovated.

Woodland

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

Building Sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require

some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. Special design of structures is needed to prevent damage caused by wetness.
- In some areas the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Map Unit Interpretive Groups

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

Local Roads and Streets

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

Component Interpretive Groups

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

Soil Properties and Qualities

CELINA
Available water capacity: About 6.5 inches to a depth of 34 inches
Cation-exchange capacity of the surface layer: 9.0 to 19 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 20 to 40 inches
Depth to the top of the seasonal high water table: 1.5 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: A thin layer of loess and the underlying till
Permeability: Very slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material.

Pastureland

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

Woodland

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

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

MfB2=Miamian-Celina silt loams, 2 to 6 percent slopes, eroded

Setting
Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Shoulders

Map Unit Composition
Miamian and similar components: 60 percent
Celina and similar components: 30 percent

Contrasting Components
Crosby soils: 5 percent
Kokomo soils: 5 percent

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

Soil Properties and Qualities

MIAMIAN
Available water capacity: About 6.5 inches to a depth of 36 inches
Cation-exchange capacity of the surface layer: 9.0 to 17 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 20 to 40 inches
Depth to the top of the seasonal high water table: 2.5 to 3.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: A thin layer of loess and the underlying till
Permeability: Slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

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

- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material.

Pastureland

- Erosion control is needed when pastures are renovated.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

Soil Properties and Qualities

CELINA
Available water capacity: About 6.3 inches to a depth of 33 inches
Cation-exchange capacity of the surface layer: 8.0 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 20 to 40 inches
Depth to the top of the seasonal high water table: 1.5 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: A thin layer of loess and the underlying till
Permeability: Very slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

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

Pastureland

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

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

MgE2=Miamian-Kendallville silt loams, 18 to 25 percent slopes, eroded

Setting
Landform: Wisconsinan till plains and moraines
Position on the landform: Backslopes

Map Unit Composition
Miamian and similar components: 70 percent
Kendallville and similar components: 20 percent

Contrasting Components
Hennepin soils: 10 percent

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

Soil Properties and Qualities

MIAMIAN
Available water capacity: About 6.7 inches to a depth of 38 inches
Cation-exchange capacity of the surface layer: 9.0 to 17 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 20 to 40 inches
Depth to the top of the seasonal high water table: 2.5 to 3.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: A thin layer of loess and the underlying till
Permeability: Slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

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

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during construction of haul roads and log landings.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- The slope creates unsafe operating conditions and reduces the operating efficiency of harvesting and mechanical planting equipment.
- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- The slope restricts the use of equipment for preparing this site for planting and seeding.
- Burning may destroy organic matter.

Building Sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. Special design of structures is needed to prevent damage caused by wetness.
- In some areas the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

MIAMIAN
Pasture and hayland suitability group: A-2
Hydric soil: No

Soil Properties and Qualities

KENDALLVILLE
Available water capacity: About 4.4 inches to a depth of 29 inches
Cation-exchange capacity of the surface layer: 4.0 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 20 to 40 inches
Depth to the top of the seasonal high water table: Greater than 6.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: A thin layer of loess and the underlying outwash and till
Permeability: Moderately slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during construction of haul roads and log landings.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The slope creates unsafe operating conditions and reduces the operating efficiency of harvesting and mechanical planting equipment.
- The slope may restrict the use of some mechanical planting equipment.
- Rock fragments in the soil obstruct the use of mechanical planting equipment.
- The slope restricts the use of equipment for preparing this site for planting and seeding.
- Burning may destroy organic matter.

Building Sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- In some areas the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.

Local Roads and Streets

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

Component Interpretive Groups

KENDALLVILLE
Pasture and hayland suitability group: A-2
Hydric soil: No

MgF2=Miamian-Kendallville silt loams, 25 to 50 percent slopes, eroded

Setting
Landform: Wisconsinan till plains and moraines
Position on the landform: Backslopes

Map Unit Composition
Miamian and similar components: 70 percent
Kendallville and similar components: 20 percent

Contrasting Components
Hennepin soils: 10 percent

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

Soil Properties and Qualities

MIAMIAN
Available water capacity: About 5.1 inches to a depth of 28 inches
Cation-exchange capacity of the surface layer: 9.0 to 17 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 20 to 40 inches
Depth to the top of the seasonal high water table: 2.5 to 3.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: A thin layer of loess and the underlying till
Permeability: Slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- This soil is generally not recommended for pasture.

Woodland

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

- Because of the slope, the use of mechanical planting equipment is not practical.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Burning may destroy organic matter.

Building Sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. Special design of structures is needed to prevent damage caused by wetness.
- In some areas the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

MIAMIAN
Pasture and hayland suitability group: A-3
Hydric soil: No

Soil Properties and Qualities

KENDALLVILLE
Available water capacity: About 5.2 inches to a depth of 35 inches
Cation-exchange capacity of the surface layer: 4.0 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 20 to 40 inches
Depth to the top of the seasonal high water table: Greater than 6.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: A thin layer of loess and the underlying outwash and till
Permeability: Moderately slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- This soil is generally not recommended for pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during construction of haul roads and log landings.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.

- The slope creates unsafe operating conditions and reduces the operating efficiency of harvesting and mechanical planting equipment.
- Because of the slope, use of equipment to prepare this site for planting and seeding is not practical.
- Because of the slope, the use of mechanical planting equipment is not practical.
- Rock fragments in the soil obstruct the use of mechanical planting equipment.
- Burning may destroy organic matter.

Building Sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- In some areas the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.

Local Roads and Streets

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

Component Interpretive Groups

KENDALLVILLE
Pasture and hayland suitability group: A-3
Hydric soil: No

MhC3=Miamian-Losantville clay loams, 6 to 12 percent slopes, severely eroded

Setting
Landform: Wisconsinan till plains
Position on the landform: Shoulders

Map Unit Composition
Miamian and similar components: 60 percent
Losantville and similar components: 30 percent

Contrasting Components
Celina soils: 5 percent
Miami soils: 5 percent

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

Soil Properties and Qualities

MIAMIAN
Available water capacity: About 4.6 inches to a depth of 26 inches
Cation-exchange capacity of the surface layer: 8.0 to 16 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 20 to 40 inches
Depth to the top of the seasonal high water table: 2.5 to 3.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Till
Permeability: Slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Clay loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.

- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

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

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. Special design of structures is needed to prevent damage caused by wetness.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- In some areas the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

Soil Properties and Qualities

LOSANTVILLE
Available water capacity: About 2.4 inches to a depth of 19 inches
Cation-exchange capacity of the surface layer: 9.0 to 21 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 12 to 20 inches
Depth to the top of the seasonal high water table: 1.0 to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None

Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Basal till
Permeability: Very slow or slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Clay loam
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.
- Subsurface drainage helps to lower the seasonal high water table.
- The rooting depth of crops is restricted by dense soil material.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

MhD3=Miamian-Losantville clay loams, 12 to 18 percent slopes, severely eroded

Setting
Landform: Wisconsinan till plains
Position on the landform: Backslopes

Map Unit Composition
Miamian and similar components: 60 percent
Losantville and similar components: 30 percent

Contrasting Components
Celina soils: 5 percent
Miami soils: 5 percent

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

Soil Properties and Qualities

MIAMIAN
Available water capacity: About 5.9 inches to a depth of 33 inches
Cation-exchange capacity of the surface layer: 8.0 to 16 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 20 to 40 inches
Depth to the top of the seasonal high water table: 2.5 to 3.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Till
Permeability: Slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Clay loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for

erosion during construction of haul roads and log landings.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- The slope restricts the use of equipment for preparing this site for planting and seeding.
- Burning may destroy organic matter.

Building Sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. Special design of structures is needed to prevent damage caused by wetness.
- In some areas the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

Soil Properties and Qualities

LOSANTVILLE
Available water capacity: About 1.9 inches to a depth of 14 inches
Cation-exchange capacity of the surface layer: 9.0 to 21 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 12 to 20 inches
Depth to the top of the seasonal high water table: 1.0 to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Basal till
Permeability: Very slow or slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Clay loam
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.
- Subsurface drainage helps to lower the seasonal high water table.
- The rooting depth of crops is restricted by dense soil material.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during construction of haul roads and log landings.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of this soil by log trucks.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- The slope restricts the use of equipment for preparing this site for planting and seeding.
- Burning may destroy organic matter.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- In some areas the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

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

Local Roads and Streets

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

- Special design of roads and streets is needed to prevent the structural damage caused by low soil strength.
- Because of the slope, designing local roads and streets is difficult.

Component Interpretive Groups

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

MmE2=Miamian-Hennepin silt loams, 18 to 25 percent slopes, eroded

Setting
Landform: Wisconsinan till plains
Position on the landform: Backslopes

Map Unit Composition
Miamian and similar components: 70 percent
Hennepin and similar components: 30 percent

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

Soil Properties and Qualities

MIAMIAN
Available water capacity: About 4.6 inches to a depth of 26 inches
Cation-exchange capacity of the surface layer: 9.0 to 17 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 20 to 40 inches
Depth to the top of the seasonal high water table: 2.5 to 3.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: A thin layer of loess and the underlying till
Permeability: Slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during construction of haul roads and log landings.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The slope creates unsafe operating conditions and reduces the operating efficiency of harvesting and mechanical planting equipment.
- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- The slope restricts the use of equipment for preparing this site for planting and seeding.
- Burning may destroy organic matter.

Building Sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. Special design of structures is needed to prevent damage caused by wetness.
- In some areas the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

MIAMIAN
Pasture and hayland suitability group: A-2
Hydric soil: No

Soil Properties and Qualities

HENNEPIN
Available water capacity: About 2.8 inches to a depth of 19 inches
Cation-exchange capacity of the surface layer: 14 to 20 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 10 to 20 inches
Depth to the top of the seasonal high water table: Greater than 6 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Basal till
Permeability: Slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during construction of haul roads and log landings.
- The high content of lime in the upper part of the soil may cause a nutrient imbalance in seedlings.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- The slope creates unsafe operating conditions and reduces the operating efficiency of harvesting and mechanical planting equipment.

- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- The slope restricts the use of equipment for preparing this site for planting and seeding.
- Burning may destroy organic matter.

Building Sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- In some areas the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.

Local Roads and Streets

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

Component Interpretive Groups

HENNEPIN
Pasture and hayland suitability group: A-2
Hydric soil: No

MnE3=Miamian-Hennepin clay loams, 18 to 25 percent slopes, severely eroded

Setting
Landform: Wisconsinan till plains
Position on the landform: Backslopes

Map Unit Composition
Miamian and similar components: 70 percent
Hennepin and similar components: 30 percent

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

Soil Properties and Qualities

MIAMIAN
Available water capacity: About 4.6 inches to a depth of 26 inches
Cation-exchange capacity of the surface layer: 9.0 to 17 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 20 to 40 inches
Depth to the top of the seasonal high water table: 2.5 to 3.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Till
Permeability: Slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Clay loam
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during construction of haul roads and log landings.

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

Building Sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. Special design of structures is needed to prevent damage caused by wetness.
- In some areas the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

MIAMIAN
Pasture and hayland suitability group: A-2
Hydric soil: No

Soil Properties and Qualities

HENNEPIN
Available water capacity: About 2.7 inches to a depth of 18 inches
Cation-exchange capacity of the surface layer: 14 to 20 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 10 to 20 inches
Depth to the top of the seasonal high water table: Greater than 6 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Basal till
Permeability: Slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Clay loam
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

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

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

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during construction of haul roads and log landings.
- The high content of lime in the upper part of the soil may cause a nutrient imbalance in seedlings.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- The slope creates unsafe operating conditions and reduces the operating efficiency of harvesting and mechanical planting equipment.
- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- The slope restricts the use of equipment for preparing this site for planting and seeding.
- Burning may destroy organic matter.
- Building Sites

Building Sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- In some areas the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.

Local Roads and Streets

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

Component Interpretive Groups

HENNEPIN
Pasture and hayland suitability group: A-2
Hydric soil: No

MpA=Milford silty clay loam, 0 to 2 percent slopes

Setting
Landform: Depressions on glacial lake plains

Map Unit Composition
Milford and similar components: 100 percent

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

Soil Properties and Qualities

Available water capacity: About 11.4 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 26 to 36 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 0.0 to 1.0 feet
Water table kind: Apparent
Ponding: Long
Depth of ponding: 0.0 to 0.5 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 4.0 to 6.0 percent
Parent material: Lacustrine sediments
Permeability: Moderately slow
Potential frost action: High
Shrink-swell potential: High
Surface layer texture: Silty clay loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

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

Pastureland

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

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

MrA=Milford silty clay loam, gravelly substratum, 0 to 2 percent slopes

Setting
Landform: Depressions on glacial lake plains

Map Unit Composition
Milford and similar components: 100 percent

Map Unit Interpretive Groups
Land capability classification: 2w

Prime farmland: Prime farmland if drained

Soil Properties and Qualities

Available water capacity: About 11.5 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 26 to 36 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 0.0 to 1.0 feet
Water table kind: Apparent
Ponding: Long
Depth of ponding: 0.0 to 0.5 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 4.0 to 6.0 percent
Parent material: Lacustrine sediments over gravelly and sandy outwash
Permeability: Moderately slow in the lacustrine sediments and rapid or very rapid in the outwash
Potential frost action: High
Shrink-swell potential: High
Surface layer texture: Silty clay loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- A combination of surface and subsurface drainage helps to remove excess water (fig. 14).
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

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

Figure 14. Ponding in an area of Milford silty clay loam, gravelly substratum, 0 to 2 percent slopes, can damage crops.

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

MsA=Millsdale silt loam, 0 to 2 percent slopes

Setting
Landform: Depressions and flats on Wisconsinan terraces

Map Unit Composition
Millsdale and similar components: 90 percent

Contrasting Components:
Randolph soils: 10 percent

Map Unit Interpretive Groups
Land capability classification: 4w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

Available water capacity: About 4.5 inches to a depth of 25 inches
Cation-exchange capacity of the surface layer: 20 to 36 meq per 100 grams
Depth class: Moderately deep
Depth to root restrictive feature: Bedrock (lithic): 20 to 40 inches
Depth to the top of the seasonal high water table: 0.0 to 1.0 feet
Water table kind: Apparent
Ponding: Long
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 4.0 to 7.0 percent
Parent material: Till over limestone
Permeability: Moderately slow in the till and slow to impermeable in the underlying bedrock
Potential frost action: High
Shrink-swell potential: High
Surface layer texture: Silt loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock and a high clay content.
- Plants may suffer from moisture stress because of the limited available water capacity.
- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Controlling traffic can minimize soil compaction.
- A combination of surface and subsurface drainage helps to remove excess water.
- The movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to

facilitate the movement of water into subsurface drains.
- The depth to bedrock may restrict the gradient needed to provide adequate drainage from subsurface systems.

Pastureland

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

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

MtA=Millsdale silty clay loam, 0 to 2 percent slopes

Setting
Landform: Depressions and flats on Wisconsinan till plains

Map Unit Composition
Millsdale and similar components: 90 percent

Contrasting Components
Randolph soils: 10 percent

Map Unit Interpretive Groups
Land capability classification: 4w
Prime farmland: Prime farmland if drained

Soil Properties and Qualities

Available water capacity: About 5.0 inches to a depth of 30 inches
Cation-exchange capacity of the surface layer: 20 to 36 meq per 100 grams
Depth class: Moderately deep
Depth to root restrictive feature: Bedrock (lithic): 20 to 40 inches
Depth to the top of the seasonal high water table: 0.0 to 1.0 feet
Water table kind: Apparent
Ponding: Long
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 4.0 to 7.0 percent
Parent material: Till over limestone
Permeability: Moderately slow in the till and slow to impermeable in the underlying bedrock
Potential frost action: High
Shrink-swell potential: High
Surface layer texture: Silty clay loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock and a high clay content.
- Plants may suffer from moisture stress because of the limited available water capacity.
- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- A combination of surface and subsurface drainage helps to remove excess water.
- The movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.
- The depth to bedrock may restrict the gradient needed to provide adequate drainage from subsurface systems.

Pastureland

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

Woodland

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

Building Sites

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

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

MuA=Milton silt loam, 0 to 2 percent slopes

Setting
Landform: Flats on the Wisconsinan till plains
Position on the landform: Summits

Map Unit Composition
Milton and similar components: 95 percent

Cotrasting Components
Randolph soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 5.2 inches to a depth of 31 inches
Cation-exchange capacity of the surface layer: 10 to 22 meq per 100 grams
Depth class: Moderately deep
Depth to root restrictive feature: Bedrock (lithic): 20 to 40 inches
Depth to the top of the seasonal high water table: Greater than 2.6 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: A thin layer of loess and the underlying till over limestone
Permeability: Moderate or moderately slow in the till and slow to impermeable in the underlying bedrock
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

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

- This soil provides poor summer pasture.
- The rooting depth of plants may be restricted by bedrock.

Woodland

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

Building Sites

- The depth to bedrock and hardness of the bedrock greatly reduce the ease of excavation and increase the difficulty in constructing foundations and installing utilities.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

MILTON
Pasture and hayland suitability group: F-1
Hydric soil: No

MuB=Milton silt loam, 2 to 6 percent slopes

Setting
Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Summits

Map Unit Composition
Milton and similar components: 95 percent

Contrasting Components
Randolph soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 4.7 inches to a depth of 28 inches
Cation-exchange capacity of the surface layer: 10 to 22 meq per 100 grams
Depth class: Moderately deep
Depth to root restrictive feature: Bedrock (lithic): 20 to 40 inches
Depth to the top of the seasonal high water table: Greater than 2.3 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: A thin layer of loess and the underlying till over limestone
Permeability: Moderate or moderately slow in the till and slow to impermeable in the underlying bedrock
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock.
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

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

Woodland

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

Building Sites

- The depth to bedrock and hardness of the bedrock greatly reduce the ease of excavation and increase the difficulty in constructing foundations and installing utilities.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

MILTON
Pasture and hayland suitability group: F-1
Hydric soil: No

MuB2=Milton silt loam, 2 to 6 percent slopes, eroded

Setting
Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Shoulders

Map Unit Composition
Milton and similar components: 95 percent

Contrasting Components
Randolph soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 4.5 inches to a depth of 28 inches
Cation-exchange capacity of the surface layer: 8.0 to 20 meq per 100 grams
Depth class: Moderately deep
Depth to root restrictive feature: Bedrock (lithic): 20 to 40 inches
Depth to the top of the seasonal high water table: Greater than 2.3 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: A thin layer of loess and the underlying till over limestone
Permeability: Moderate or moderately slow in the till and slow to impermeable in the underlying bedrock
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock.
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

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

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Bedrock may interfere with the construction of haul roads and log landing sites.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- Burning may destroy organic matter.

Building Sites

- The depth to bedrock and hardness of the bedrock greatly reduce the ease of excavation and increase the difficulty in constructing foundations and installing utilities.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

MILTON
Pasture and hayland suitability group: F-1
Hydric soil: No

MuC2=Milton silt loam, 6 to 12 percent slopes, eroded

Setting
Landform: Wisconsinan till plains
Position on the landform: Shoulders

Map Unit Composition
Milton and similar components: 95 percent

Contrasting Components
Randolph soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 4.4 inches to a depth of 28 inches
Cation-exchange capacity of the surface layer: 8.0 to 20 meq per 100 grams
Depth class: Moderately deep
Depth to root restrictive feature: Bedrock (lithic): 20 to 40 inches
Depth to the top of the seasonal high water table: Greater than 2.3 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: A thin layer of loess and the underlying till over limestone
Permeability: Moderate or moderately slow in the till and slow to impermeable in the underlying bedrock
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.

- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- The rooting depth of plants may be restricted by bedrock.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Bedrock may interfere with the construction of haul roads and log landing sites.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- Burning may destroy organic matter.

Building Sites

- The depth to bedrock and hardness of the bedrock greatly reduce the ease of excavation and increase the difficulty in constructing foundations and installing utilities.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

MILTON
Pasture and hayland suitability group: F-1
Hydric soil: No

MuD2=Milton silt loam, 12 to 18 percent slopes, eroded

Setting
Landform: Wisconsinan till plains
Position on the landform: Backslopes

Map Unit Composition
Milton and similar components: 90 percent

Contrasting Components
Randolph soils: 10 percent

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

Soil Properties and Qualities

Available water capacity: About 4.6 inches to a depth of 29 inches
Cation-exchange capacity of the surface layer: 8.0 to 20 meq per 100 grams
Depth class: Moderately deep

Depth to root restrictive feature: Bedrock (lithic): 20 to 40 inches
Depth to the top of the seasonal high water table: Greater than 2.4 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: A thin layer of loess and the underlying till over limestone
Permeability: Moderate or moderately slow in the till and slow to impermeable in the underlying bedrock
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- The rooting depth of plants may be restricted by bedrock.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during construction of haul roads and log landings.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Bedrock may interfere with the construction of haul roads and log landing sites.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- The slope restricts the use of equipment for preparing this site for planting and seeding.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- Burning may destroy organic matter.

Building Sites

- The depth to bedrock and hardness of the bedrock greatly reduce the ease of excavation and increase the difficulty in constructing foundations and installing utilities.
- The slope influences the use of machinery and the amount of excavation required. Special

building practices and designs are required to ensure satisfactory performance.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

MILTON
Pasture and hayland suitability group: F-1
Hydric soil: No

MuE2=Milton silt loam, 18 to 25 percent slopes, eroded

Setting
Landform: Wisconsinan till plains
Position on the landform: Backslopes

Map Unit Composition
Milton and similar components: 95 percent

Contrasting Components
Randolph soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 3.6 inches to a depth of 23 inches
Cation-exchange capacity of the surface layer: 8.0 to 20 meq per 100 grams
Depth class: Moderately deep
Depth to root restrictive feature: Bedrock (lithic): 20 to 40 inches
Depth to the top of the seasonal high water table: Greater than 1.9 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: A thin layer of loess and the underlying till over limestone
Permeability: Moderate or moderately slow in the till and slow to impermeable in the underlying bedrock
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Properly designed erosion-control practices are needed on the steeper slopes.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- The rooting depth of plants may be restricted by bedrock.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during construction of haul roads and log landings.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Bedrock may interfere with the construction of haul roads and log landing sites.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The slope creates unsafe operating conditions and reduces the operating efficiency of harvesting and mechanical planting equipment.
- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- The slope restricts the use of equipment for preparing this site for planting and seeding.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- Burning may destroy organic matter.

Building Sites

- The depth to bedrock and hardness of the bedrock greatly reduce the ease of excavation and increase the difficulty in constructing foundations and installing utilities.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- In some areas the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

MILTON
Pasture and hayland suitability group: F-1
Hydric soil: No

MwA=Morningsun silt loam, 0 to 2 percent slopes

Setting
Landform: Flats on the Wisconsinan ground moraines
Position on the landform: Summits

Map Unit Composition
Morningsun and similar components: 85 percent

Contrasting Components
Sugarvalley soils: 10 percent
Cyclone soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 12.5 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 11 to 23 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 2.0 to 3.5 feet
Water table kind: Apparent
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loess and the underlying water modified till
Permeability: Moderate
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

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

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Component Interpretive Groups

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

MxA=Morningsun-Xenia silt loams, 0 to 2 percent slopes

Setting
Landform: Flats on the Wisconsinan ground moraines
Position on the landform: Summits

Map Unit Composition
Morningsun and similar components: 70 percent
Xenia and similar components: 20 percent

Contrasting Components
Cyclone soils: 6 percent
Fincastle soils: 2 percent
Sugarvalley soils: 2 percent

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

Soil Properties and Qualities

MORNINGSUN
Available water capacity: About 13.1 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 11 to 23 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 2.0 to 3.5 feet
Water table kind: Apparent
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loess and the underlying water modified till
Permeability: Moderate
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

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

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

Soil Properties and Qualities

XENIA
Available water capacity: About 8.6 inches to a depth of 45 inches
Cation-exchange capacity of the surface layer: 6.0 to 20 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 40 to 60 inches
Depth to the top of the seasonal high water table: 1.5 to 2.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loess and the underlying till
Permeability: Slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

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

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

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

Component Interpretive Groups

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

MxB=Morningsun-Xenia silt loams, 2 to 6 percent slopes

Setting
Landform: Sight rises on the Wisconsinan ground moraines
Position on the landform: Summits

Map Unit Composition
Morningsun and similar components:
Xenia and similar components:

Contrasting Components
Celina soils: 10 percent
Miamian soils: 5 percent
Fincastle soils: 3 percent
Sugarvalley soils: 2 percent

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

Soil Properties and Qualities

MORNINGSUN
Available water capacity: About 12.0 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 11 to 23 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 2.0 to 3.5 feet
Water table kind: Apparent
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loess and the underlying water modified till
Permeability: Moderate
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

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

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

Soil Properties and Qualities

XENIA
Available water capacity: About 9.5 inches to a depth of 50 inches
Cation-exchange capacity of the surface layer: 6.0 to 20 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 40 to 60 inches
Depth to the top of the seasonal high water table: 1.5 to 2.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loess and the underlying till
Permeability: Slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

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

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

MxB2=Morningsun-Xenia silt loams, 2 to 6 percent slopes, eroded

Setting
Landform: Slight rises on the Wisconsinan ground moraines
Position on the landform: Shoulders

Map Unit Composition
Morningsun and similar components: 50 percent
Xenia and similar components: 30 percent

Contrasting Components
Miamian soils: 10 percent
Celina soils: 5 percent
Fincastle soils: 3 percent
Sugarvalley soils: 2 percent

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

Soil Properties and Qualities

MORNINGSUN
Available water capacity: About 12.0 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 10 to 22 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 2.0 to 3.5 feet
Water table kind: Apparent
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: Loess and the underlying water modified till
Permeability: Moderate
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

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

- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

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

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

Soil Properties and Qualities

XENIA
Available water capacity: About 8.4 inches to a depth of 45 inches
Cation-exchange capacity of the surface layer: 5.0 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 40 to 60 inches
Depth to the top of the seasonal high water table: 1.5 to 2.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: Loess and the underlying till
Permeability: Slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

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

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

MyA=Mahalasville silt loam, 0 to 2 percent slopes

Setting
Landform: Depressions on lake plains

Map Unit Composition
Mahalasville and similar components: 100 percent

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

Soil Properties and Qualities

Available water capacity: About 9.4 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 17 to 21 meq per 100 grams

Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 0.0 to 0.5 feet
Water table kind: Apparent
Ponding: Long
Depth of ponding: 0.0 to 0.5 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 5.0 percent
Parent material: Loess or other silty material and the underlying loamy and sandy outwash
Permeability: Moderate in the solum and moderately rapid in the substratum
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

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

Pastureland

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

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

MAHALASVILLE
Pasture and hayland suitability group: C-1

Hydric soil: Yes

OcA=Ockley silt loam, 0 to 2 percent slopes

Setting
Landform: Wisconsinan outwash terraces
Position on the landform: Treads

Map Unit Composition
Ockley and similar components: 90 percent

Contrasting Components
Eldean soils: 5 percent
Warsaw soils: 5 percent

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

Soil Properties and Qualities

- Available water capacity: About 5.5 inches to a depth of 48 inches
- Cation-exchange capacity of the surface layer: 3.0 to 15 meq per 100 grams
- Depth class: Very deep
- Depth to root restrictive feature: Strongly contrasting textural stratification: 40 to 72 inches
- Depth to the top of the seasonal high water table: Greater than 6.0 feet
- Ponding: None
- Drainage class: Well drained
- Flooding: None
- Organic matter content in the surface layer: 0.5 to 3.0 percent
- Parent material: A thin layer of loess and loamy outwash over stratified sand and gravel
- Permeability: Moderate in the solum and very rapid in the substratum
- Potential frost action: Moderate
- Shrink-swell potential: Moderate
- Surface layer texture: Silt loam
- Potential for surface runoff: Low
- Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

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

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

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

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

Local Roads and Streets

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

Component Interpretive Groups

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

OcB=Ockley silt loam, 2 to 6 percent slopes

Setting
Landform: Wisconsinan outwash terraces
Position on the landform: Treads

Map Unit Composition
Ockley and similar components: 85 percent

Contrasting Components
Eldean soils: 10 percent
Warsaw soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 5.7 inches to a depth of 50 inches
Cation-exchange capacity of the surface layer: 3.0 to 15 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Strongly contrasting textural stratification: 40 to 72 inches
Depth to the top of the seasonal high water table: Greater than 6.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 3.0 percent
Parent material: A thin layer of loess and loamy outwash over stratified sand and gravel
Permeability: Moderate in the solum and very rapid in the substratum
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

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

Woodland

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

- A loss of soil productivity may occur following an episode of fire.

Building Sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

Pg=Pits, gravel

Setting
Landform: None assigned

Map Unit Composition
Pits, gravel and similar components: 100 percent

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

Use and Management Considerations

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

Component Interpretive Groups

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

Pq=Pits, quarry

Setting
Landform: None assigned

Map Unit Composition
Pits, quarry and similar components: 100 percent

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

Use and Management Considerations
- Onsite investigation is needed to determine the suitability for specific uses.

Component Interpretive Groups

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

PtB=Plattville silt loam, moderately wet, 2 to 6 percent slopes

Setting
Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Backslopes

Map Unit Composition
Plattville and similar components: 85 percent

Contrasting Components
Millsdale soils: 5 percent
Milton soils: 5 percent
Randolph soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 8.2 inches to a depth of 54 inches
Cation-exchange capacity of the surface layer: 10 to 24 meq per 100 grams
Depth class: Deep
Depth to root restrictive feature: Bedrock (lithic): 40 to 60 inches
Depth to the top of the seasonal high water table: 2.5 to 3.5 feet
Water table kind: Apparent
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 4.0 percent
Parent material: A thin layer of loess and the underlying outwash and residuum weathered from limestone
Permeability: Moderate in the solum and slow to impermeable in the underlying bedrock
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Erosion control is needed when pastures are renovated.

Woodland

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

Building Sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The depth to bedrock and hardness of the bedrock reduce the ease of excavation and increase the difficulty of constructing foundations and installing utilities.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. Special design of structures is needed to prevent damage caused by wetness.

Septic Tank Absorption Fields

- The limited depth to bedrock reduces the filtering capacity of the soil and greatly increases the difficulty of proper installation of the effluent distribution lines.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.
- The moderate permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.

Local Roads and Streets

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

Component Interpretive Groups

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

RaA=Rainsville silt loam, 0 to 2 percent slopes

Setting
Landform: Wisconsinan ground moraines
Position on the landform: Summits

Map Unit Composition
Rainsville and similar components: 85 percent

Contrasting Components
Ockley soils: 10 percent
Miamian soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 10.0 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 7.0 to 21 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 2.0 to 3.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: A thin layer of loess and the underlying loamy outwash and till
Permeability: Very slow or slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- This soil is well suited to pasture.

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.

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

Component Interpretive Groups

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

RaB=Rainsville silt loam, 2 to 6 percent slopes

Setting
Landform: Wisconsinan ground moraines
Position on the landform: Backslopes

Map Unit Composition
Rainsville and similar components: 85 percent

Contrasting Components
Ockley soils: 10 percent
Miamian soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 9.6 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 6.0 to 20 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 2.0 to 3.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: A thin layer of loess and the underlying loamy outwash and till
Permeability: Very slow or slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Erosion control is needed when pastures are renovated.

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

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

Local Roads and Streets

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

Component Interpretive Groups

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

RaB2=Rainsville silt loam, 2 to 6 percent slopes, eroded

Setting
Landform: Wisconsinan ground moraine
Position on the landform: Backslopes

Map Unit Composition
Rainsville and similar components: 85 percent

Contrasting Components
Ockley soils: 10 percent
Miamian soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 9.5 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 7.0 to 21 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 2.0 to 3.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: A thin layer of loess and the underlying loamy outwash and till
Permeability: Very slow or slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

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

Pastureland

- Erosion control is needed when pastures are renovated.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Burning may destroy organic matter.

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

RcA=Randolph silt loam, 0 to 2 percent slopes

Setting
Landform: Flats on the Wisconsinan till plains
Position on the landform: Summits

Map Unit Composition
Randolph and similar components: 95 percent

Contrasting Components
Millsdale soils: 5 percent

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

Building Sites

Available water capacity: About 5.0 inches to a depth of 33 inches
Cation-exchange capacity of the surface layer: 8.0 to 22 meq per 100 grams
Depth class: Moderately deep
Depth to root restrictive feature: Bedrock (lithic): 20 to 40 inches
Depth to the top of the seasonal high water table: 0.5 to 1.0 feet
Water table kind: Apparent
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Till over limestone
Permeability: Moderately slow in the till and slow to impermeable in the underlying bedrock
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock and a high clay content.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.
- The depth to bedrock may restrict the gradient needed to provide adequate drainage from subsurface systems.

Pastureland

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

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

RcB=Randolph silt loam, 2 to 6 percent slopes

Setting
Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Summits

Map Unit Composition
Randolph and similar components: 90 percent

Contrasting Components
Milton soils: 10 percent

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

Soil Properties and Qualities

Available water capacity: About 4.5 inches to a depth of 32 inches
Cation-exchange capacity of the surface layer: 8.0 to 22 meq per 100 grams
Depth class: Moderately deep
Depth to root restrictive feature: Bedrock (lithic): 20 to 40 inches
Depth to the top of the seasonal high water table: 0.5 to 1.0 feet
Water table kind: Apparent
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Till over limestone
Permeability: Moderately slow in the till and slow to impermeable in the underlying bedrock
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock and a high clay content.
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.
- The depth to bedrock may restrict the gradient needed to provide adequate drainage from subsurface systems.

Pastureland

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

Woodland

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

soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

RnE2=Rodman gravelly loam, 18 to 25 percent slopes, eroded

Setting
Landform: Outwash plains
Position on the landform: Backslopes

Map Unit Composition
Rodman and similar components: 85 percent

Contrasting Components
Fox soils: 15 percent

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

Soil Properties and Qualities

Available water capacity: About 2.7 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 5.0 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: Greater than 6.0 feet
Ponding: None
Drainage class: Excessively drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 4.0 percent
Parent material: Outwash
Permeability: Moderately rapid in the solum and very rapid in the substratum
Potential frost action: Low
Shrink-swell potential: Low
Surface layer texture: Gravelly loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.

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

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during construction of haul roads and log landings.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Sandy layers in this soil increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The slope creates unsafe operating conditions and reduces the operating efficiency of harvesting and mechanical planting equipment.
- The slope may restrict the use of some mechanical planting equipment.
- Rock fragments in the soil obstruct the use of mechanical planting equipment.
- The slope restricts the use of equipment for preparing this site for planting and seeding.

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

RnF2=Rodman gravelly loam, 25 to 50 percent slopes, eroded

Setting
Landform: Outwash plains
Position on the landform: Backslopes

Map Unit Composition
Rodman and similar components: 85 percent

Contrasting Components
Fox soils: 15 percent

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

Soil Properties and Qualities

Available water capacity: About 2.7 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 5.0 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: Greater than 6.0 feet
Ponding: None
Drainage class: Excessively drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 4.0 percent
Parent material: Outwash

Permeability: Moderately rapid in the solum and very rapid in the substratum
Potential frost action: Low
Shrink-swell potential: Low
Surface layer texture: Gravelly loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- This soil is generally not recommended for pasture.

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

RODMAN
Pasture and hayland suitability group: B-2
Hydric soil: No

RoE2=Rodman-Kendallville complex, 18 to 25 percent slopes, eroded

Setting
Landform: Kames
Position on the landform: Backslopes (Rodman soils) and footslopes (Kendallville soils)

Map Unit Composition
Rodman and similar components: 50 percent
Kendallville and similar components: 40 percent

Contrasting Components
Fox soils: 10 percent

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

Soil Properties and Qualities

RODMAN
Available water capacity: About 2.7 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 5.0 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: Greater than 6.0 feet
Ponding: None
Drainage class: Excessively drained
Flooding: None

Organic matter content in the surface layer: 2.0 to 4.0 percent
Parent material: Outwash
Permeability: Moderately rapid in the solum and very rapid in the substratum
Potential frost action: Low
Shrink-swell potential: Low
Surface layer texture: Gravelly loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during construction of haul roads and log landings.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Sandy layers in this soil increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The slope creates unsafe operating conditions and reduces the operating efficiency of harvesting and mechanical planting equipment.
- The slope may restrict the use of some mechanical planting equipment.
- Rock fragments in the soil obstruct the use of mechanical planting equipment.
- The slope restricts the use of equipment for preparing this site for planting and seeding.

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

Soil Properties and Qualities

KENDALLVILLE
Available water capacity: About 7.7 inches to a depth of 49 inches
Cation-exchange capacity of the surface layer: 4.0 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 28 to 53 inches
Depth to the top of the seasonal high water table: Greater than 6.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: A thin layer of loess and the underlying outwash and till

Permeability: Moderately slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

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

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during construction of haul roads and log landings.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The slope creates unsafe operating conditions and reduces the operating efficiency of harvesting and mechanical planting equipment.
- The slope may restrict the use of some mechanical planting equipment.
- The slope restricts the use of equipment for preparing this site for planting and seeding.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- In some areas the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.

Local Roads and Streets

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

Component Interpretive Groups

KENDALLVILLE
Pasture and hayland suitability group: A-2
Hydric soil: No

RoF2=Rodman-Kendallville complex, 25 to 50 percent slopes, eroded

Setting
Landform: Kames
Position on the landform: Backslopes (Rodman soils) and footslopes (Kendallville soils)

Map Unit Composition
Rodman and similar components: 50 percent
Kendallville and similar components: 40 percent

Contrasting Components
Fox soils: 10 percent

Map Unit Interpretive Groups
Land capability classification: 7s

Prime farmland: Not prime farmland

Soil Properties and Qualities

RODMAN
Available water capacity: About 2.7 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 5.0 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: Greater than 6.0 feet
Ponding: None
Drainage class: Excessively drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 4.0 percent
Parent material: Outwash
Permeability: Moderately rapid in the solum and very rapid in the substratum
Potential frost action: Low
Shrink-swell potential: Low
Surface layer texture: Gravelly loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- This soil is generally not recommended for pasture.

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

RODMAN
Pasture and hayland suitability group: B-2
Hydric soil: No

Soil Properties and Qualities

KENDALLVILLE
Available water capacity: About 6.1 inches to a depth of 40 inches
Cation-exchange capacity of the surface layer: 4.0 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 28 to 53 inches
Depth to the top of the seasonal high water table: Greater than 6.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None

Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: A thin layer of loess and the underlying outwash and till
Permeability: Moderately slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- This soil is generally not recommended for pasture.

Woodland

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

Building Sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- In some areas the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.

Local Roads and Streets

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

Component Interpretive Groups

KENDALLVILLE
Pasture and hayland suitability group: A-3
Hydric soil: No

RpA=Rossburg silt loam, moderately wet, sandy substratum, 0 to 1 percent slopes, occasionally flooded

Setting
Landform: Flood plains

Map Unit Composition
Rossburg and similar components: 85 percent

Contrasting Components
Stonelick soils: 10 percent
Sloan soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 9.2 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 13 to 32 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 3.5 to 6.0 feet
Water table kind: Apparent
Ponding: None
Drainage class: Well drained
Flooding: Occasional
Organic matter content in the surface layer: 4.0 to 8.0 percent
Parent material: Loamy alluvium over sandy and gravelly alluvium
Permeability: Moderate in the solum and moderately rapid to rapid in the substratum
Potential frost action: Moderate in the loamy alluvium and moderately rapid or rapid in the sandy and gravelly alluvium
Shrink-swell potential: Low
Surface layer texture: Silt loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

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

Pastureland

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

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

RuB=Russell-Miamian silt loams, 2 to 6 percent slopes

Setting
Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Summits

Map Unit Composition
Russell and similar components: 70 percent
Miamian and similar components: 20 percent

Contrasting Components
Celina soils: 5 percent
Xenia soils: 5 percent

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

Soil Properties and Qualities

RUSSELL
Available water capacity: About 10.9 inches to a depth of 58 inches
Cation-exchange capacity of the surface layer: 5.0 to 19 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 40 to 65 inches
Depth to the top of the seasonal high water table: 3.5 to 6.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Loess and the underlying till
Permeability: Moderately slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

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

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

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

Component Interpretive Groups

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

Soil Properties and Qualities

MIAMIAN
Available water capacity: About 5.3 inches to a depth of 32 inches
Cation-exchange capacity of the surface layer: 10 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 20 to 40 inches
Depth to the top of the seasonal high water table: 2.5 to 3.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: A thin layer of loess and the underlying till
Permeability: Slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material.

Pastureland

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

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.

Building Sites

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

Special design of structures is needed to prevent damage caused by wetness.
- In some areas the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

RuB2=Russell-Miamian silt loams, 2 to 6 percent slopes, eroded

Setting
Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Shoulders

Map Unit Composition
Russell and similar components: 50 percent
Miamian and similar components: 40 percent

Contrasting Components
Celina soils: 5 percent
Xenia soils: 5 percent

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

Soil Properties and Qualities

RUSSELL
Available water capacity: About 9.4 inches to a depth of 50 inches
Cation-exchange capacity of the surface layer: 4.0 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 40 to 63 inches
Depth to the top of the seasonal high water table: 3.5 to 6.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Loess and the underlying till
Permeability: Moderately slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Erosion control is needed when pastures are renovated.

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

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

Soil Properties and Qualities

MIAMIAN
Available water capacity: About 5.9 inches to a depth of 33 inches
Cation-exchange capacity of the surface layer: 9.0 to 17 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 20 to 40 inches
Depth to the top of the seasonal high water table: 2.5 to 3.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: A thin layer of loess and the underlying till
Permeability: Slow
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material.

Pastureland

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

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

SeA=Savona silt loam, 0 to 2 percent slopes

Setting
Landform: Wisconsinan outwash terraces
Position on the landform: Treads

Map Unit Composition
Savona and similar components: 85 percent

Contrasting Components
Lippincott soils: 10 percent
Eldean soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 6.8 inches to a depth of 45 inches
Cation-exchange capacity of the surface layer: 10 to 21 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Strongly contrasting textural stratification: 30 to 50 inches
Depth to the top of the seasonal high water table: 0.5 to 2.5 feet
Water table kind: Apparent
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 3.0 percent

Parent material: Silty material and the underlying outwash high in limestone gravel and sand
Permeability: Moderately slow or moderate in the silty material and rapid in the outwash
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

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

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

SAVONA
Pasture and hayland suitability group: C-1

Hydric soil: No

SnA=Sloan silt loam, sandy substratum, 0 to 1 percent slopes, frequently flooded

Setting
Landform: Flood plains

Map Unit Composition
Sloan and similar components: 85 percent

Contrasting Components
Eel soils: 10 percent
Medway soils: 5 percent

Map Unit Interpretive Groups
Land capability classification: 3w
Prime farmland: Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season

Soil Properties and Qualities

Available water capacity: About 10.5 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 13 to 26 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 0.0 to 1.0 feet
Water table kind: Apparent
Ponding: Long
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: Frequent
Organic matter content in the surface layer: 3.0 to 6.0 percent
Parent material: Loamy alluvium over sandy alluvium
Permeability: Moderately slow or moderate in the loamy alluvium and moderately rapid or rapid in the sandy alluvium
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Controlling traffic can minimize soil compaction.
- Winter grain crops are commonly not grown because of frequent flooding.
- Measures that protect the soil from scouring and minimize the loss of crop residue by floodwaters are needed.
- A combination of surface and subsurface drainage helps to remove excess water.

Pastureland

- Forage production can be improved by seeding grass-legume mixtures that are tolerant of flooding.
- Sediment left on forage plants after a flood event may reduce palatability and forage intake by the grazing animal.
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

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

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

SLOAN
Pasture and hayland suitability group: C-3
Hydric soil: Yes

StA=Stonelick loam, gravelly substratum, 0 to 1 percent slopes, frequently flooded

Setting
Landform: Flood plains

Map Unit Composition
Stonelick and similar components: 90 percent

Contrasting Components
Rossburg soils: 10 percent

Map Unit Interpretive Groups
Land capability classification: 3w
Prime farmland: Prime farmland if protected from flooding or not frequently flooded during the growing season

Soil Properties and Qualities

Available water capacity: About 7.0 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 12 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: Greater than 6 feet
Ponding: None
Drainage class: Well drained
Flooding: Frequent
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Calcareous, loamy and sandy alluvium over gravelly alluvium
Permeability: Moderately rapid in the loamy and sandy alluvium and rapid in the gravelly alluvium
Potential frost action: Moderate
Shrink-swell potential: Low
Surface layer texture: Loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Winter grain crops are commonly not grown because of frequent flooding.

- Measures that protect the soil from scouring and minimize the loss of crop residue by floodwaters are needed.

Pastureland

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

Woodland

- The high pH in the soil may cause a nutrient imbalance in seedlings.
- The high content of lime in the upper part of the soil may cause a nutrient imbalance in seedlings.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Flooding may result in damage to haul roads and increased maintenance costs.
- Flooding restricts the safe use of roads by log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- A loss of soil productivity may occur following an episode of fire.

Building Sites

- The frequent flooding in areas of this soil greatly increases the risk of damage associated with floodwaters. Because of the flooding, this soil is generally unsuited to building site development.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic Tank Absorption Fields

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

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Special design of roads and bridges is needed to prevent the damage caused by flooding (fig. 15).

Figure 15. Flooding in an area of Stonelick loam, gravelly substratum, 0 to 1 percent slopes, frequently flooded.

Component Interpretive Groups

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

SvA=Sugarvalley silt loam, 0 to 2 percent slopes

Setting
Landform: Flats on the Wisconsinan ground moraines
Position on the landform: Summits

Map Unit Composition
Sugarvalley and similar components: 90 percent

Contrasting Components
Fincastle soils: 4 percent
Cyclone soils: 2 percent
Morningsun soils: 2 percent
Xenia soils: 2 percent

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

Soil Properties and Qualities

Available water capacity: About 11.8 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 10 to 26 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 0.5 to 2.0 feet
Water table kind: Apparent
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loess and the underlying water modified till
Permeability: Moderate
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

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

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

SwA=Sugarvalley-Fincastle silt loams, 0 to 2 percent slopes

Setting
Landform: Flats on the Wisconsinan ground moraines
Position on the landform: Summits

Map Unit Composition
Sugarvalley and similar components: 60 percent
Fincastle and similar components: 30 percent

Contrasting Components
Cyclone soils: 5 percent
Xenia soils: 3 percent
Morningsun soils: 2 percent

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

Soil Properties and Qualities

SUGARVALLEY
Available water capacity: About 11.4 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 10 to 26 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 0.5 to 2.0 feet
Water table kind: Apparent
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loess and the underlying water modified till
Permeability: Moderate
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

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

Woodland

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

Building Sites

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

- In some areas the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

Soil Properties and Qualities

FINCASTLE
Available water capacity: About 9.2 inches to a depth of 48 inches
Cation-exchange capacity of the surface layer: 6.0 to 20 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 40 to 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loess and the underlying till
Permeability: Slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

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

Woodland

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

Building Sites

- The seasonal high water table may restrict the period when excavations can be made and

may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

ThA=Thackery silt loam, 0 to 2 percent slopes

Setting
Landform: Stream terraces
Position on the landform: Treads

Map Unit Composition
Thackery and similar components: 95 percent

Contrasting Components
Westland soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 9.7 inches to a depth of 54 inches
Cation-exchange capacity of the surface layer: 8.0 to 21 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Strongly contrasting textural stratification: 35 to 70 inches
Depth to the top of the seasonal high water table: 1.0 to 2.5 feet
Water table kind: Apparent
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loamy material and the underlying calcareous outwash
Permeability: Moderate in the loamy material and rapid in the outwash
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Systematic subsurface drainage will extend the period of planting and harvesting crops.

Pastureland

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

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

ThB=Thackery silt loam, 2 to 6 percent slopes

Setting
Landform: Stream terraces
Position on the landform: Treads

Map Unit Composition
Thackery and similar components: 95 percent

Contrasting Components
Westland soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 10.3 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 8.0 to 21 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Strongly contrasting textural stratification: 35 to 70 inches
Depth to the top of the seasonal high water table: 2.5 to 3.5 feet
Water table kind: Apparent
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loamy material and the underlying calcareous outwash

Permeability: Moderate in the loamy material and rapid in the outwash
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

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

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

Ud=Udorthents

Setting
Landform: Disturbed areas

Map Unit Composition
Udorthents and similar components: 100 percent

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

Definition: Borrow areas surface mined for roadfill and areas used for landfills

Use and Management Considerations
- Onsite investigation is needed to determine the suitability for specific uses.

Component Interpretive Groups

UDORTHENTS
Pasture and hayland suitability group: Not rated
Hydric soil: Unranked

W=Water

Setting
Landform: Bodies of water

Map Unit Composition
Water and similar components: 100 percent

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

Definition: Areas that are used as ponds and bodies of water.

Use and Management Considerations

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

Component Interpretive Groups

WATER
Pasture and hayland suitability group: Not rated
Hydric soil: Unranked

WbA=Warsaw loam, 0 to 2 percent slopes

Setting
Landform: Wisconsinan outwash terraces
Position on the landform: Treads

Map Unit Composition
Warsaw and similar components: 90 percent

Contrasting Components
Eldean soils: 5 percent
Ockley soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 5.6 inches to a depth of 30 inches
Cation-exchange capacity of the surface layer: 10 to 25 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Strongly contrasting textural stratification: 20 to 40 inches
Depth to the top of the seasonal high water table: Greater than 6.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 5.0 percent
Parent material: Loamy material and the underlying gravelly outwash
Permeability: Moderate in the loamy material and very rapid in the gravelly outwash
Potential frost action: Moderate
Shrink-swell potential: Low
Surface layer texture: Loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- The rooting depth of crops is restricted by soil layers that have strongly contrasting textures.

Pastureland

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

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

WnA=Westland silt loam, 0 to 2 percent slopes

Setting
Landform: Depressions on Wisconsinan outwash terraces
Position on the landform: Treads

Map Unit Composition
Westland and similar components: 85 percent

Contrasting Components
Lippincott soils: 5 percent
Savona soils: 5 percent
Thackery soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 7.7 inches to a depth of 51 inches
Cation-exchange capacity of the surface layer: 15 to 31 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Strongly contrasting textural stratification: 40 to 60 inches
Depth to the top of the seasonal high water table: 0.0 to 0.5 feet
Water table kind: Apparent
Ponding: Long
Depth of ponding: 0.0 to 0.5 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 5.0 percent
Parent material: Loamy material over calcareous, stratified gravelly and sandy outwash
Permeability: Moderate in the loamy material and very rapid in the gravelly and sandy outwash
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

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

Pastureland

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

Woodland

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

Building Sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- In some areas the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

WyB=Wynn silt loam, 2 to 6 percent slopes

Setting
Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Summits

Map Unit Composition
Wynn and similar components: 100 percent

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

Soil Properties and Qualities

Available water capacity: About 5.3 inches to a depth of 31 inches
Cation-exchange capacity of the surface layer: 9.0 to 22 meq per 100 grams
Depth class: Moderately deep
Depth to root restrictive feature: Bedrock (paralithic): 20 to 40 inches
Depth to the top of the seasonal high water table: Greater than 2.6 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: A thin layer of loess and the underlying till over limestone and shale
Permeability: Moderately slow in the till and slow to impermeable in the underlying bedrock
Potential frost action: Moderate
Shrink-swell potential: High
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock.

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

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

Woodland

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

Building Sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The nature and depth of the soft bedrock in this soil reduces the ease of excavation and increases the difficulty in constructing foundations and installing utilities.

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

WYNN
Pasture and hayland suitability group: F-1
Hydric soil: No

WyB2=Wynn silt loam, 2 to 6 percent slopes, eroded

Setting
Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Shoulders

Map Unit Composition
Wynn and similar components: 100 percent

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

Soil Properties and Qualities

Available water capacity: About 5.2 inches to a depth of 28 inches
Cation-exchange capacity of the surface layer: 8.0 to 21 meq per 100 grams
Depth class: Moderately deep

Depth to root restrictive feature: Bedrock (paralithic): 20 to 40 inches
Depth to the top of the seasonal high water table: Greater than 2.3 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: A thin layer of loess and the underlying till over limestone and shale
Permeability: Moderately slow in the till and slow to impermeable in the underlying bedrock
Potential frost action: Moderate
Shrink-swell potential: High
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock and a high clay content.
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

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

Woodland

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

Building Sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The nature and depth of the soft bedrock in this soil reduces the ease of excavation and increases the difficulty in constructing foundations and installing utilities.

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

WYNN
Pasture and hayland suitability group: F-1
Hydric soil: No

WyC2=Wynn silt loam, 6 to 12 percent slopes, eroded

Setting
Landform: Wisconsinan till plains
Position on the landform: Shoulders

Map Unit Composition
Wynn and similar components: 100 percent

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

Soil Properties and Qualities

Available water capacity: About 4.4 inches to a depth of 23 inches
Cation-exchange capacity of the surface layer: 8.0 to 21 meq per 100 grams
Depth class: Moderately deep
Depth to root restrictive feature: Bedrock (paralithic): 20 to 40 inches
Depth to the top of the seasonal high water table: Greater than 1.9 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: A thin layer of loess and the underlying till over limestone and shale
Permeability: Moderately slow in the till and slow to impermeable in the underlying bedrock
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- The rooting depth of plants may be restricted by bedrock.

Woodland

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

- Burning may destroy organic matter.

Building Sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The nature and depth of the soft bedrock in this soil reduces the ease of excavation and increases the difficulty in constructing foundations and installing utilities.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

WYNN
Pasture and hayland suitability group: F-1
Hydric soil: No

WyD2=Wynn silt loam, 12 to 18 percent slopes, eroded

Setting
Landform: Wisconsinan till plains
Position on the landform: Backslopes

Map Unit Composition
Wynn and similar components: 95 percent

Contrasting Components
Hennepin soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 5.3 inches to a depth of 28 inches
Cation-exchange capacity of the surface layer: 8.0 to 21 meq per 100 grams
Depth class: Moderately deep
Depth to root restrictive feature: Bedrock (paralithic): 20 to 40 inches
Depth to the top of the seasonal high water table: Greater than 2.3 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: A thin layer of loess and the underlying till over limestone and shale
Permeability: Moderately slow in the till and slow to impermeable in the underlying bedrock
Potential frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent

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

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- The rooting depth of plants may be restricted by bedrock.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during construction of haul roads and log landings.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Bedrock may interfere with the construction of haul roads and log landing sites.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- The slope restricts the use of equipment for preparing this site for planting and seeding.
- Burning may destroy organic matter.

Building Sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The nature and depth of the soft bedrock in this soil reduces the ease of excavation and increases the difficulty in constructing foundations and installing utilities.

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

WYNN
Pasture and hayland suitability group: F-1
Hydric soil: No

XeA=Xenia silt loam, 0 to 2 percent slopes

Setting
Landform: Flats on the Wisconsinan till plains
Position on the landform: Summits

Map Unit Composition
Xenia and similar components: 85 percent

Contrasting Components
Cyclone soils: 6 percent
Fincastle soils: 4 percent
Morningsun soils: 3 percent
Sugarvalley soils: 2 percent

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

Soil Properties and Qualities

Available water capacity: About 9.3 inches to a depth of 48 inches
Cation-exchange capacity of the surface layer: 6.0 to 20 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 40 to 60 inches
Depth to the top of the seasonal high water table: 1.5 to 2.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loess and the underlying till
Permeability: Slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

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

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

Component Interpretive Groups

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

XeB=Xenia silt loam, 2 to 6 percent slopes

Setting
Landform: Slight rises on the Wisconsinan till plains

Position on the landform: Summits

Map Unit Composition
Xenia and similar components: 85 percent

Contrasting Components
Miamian soils: 7 percent
Celina soils: 5 percent
Morningsun soils: 3 percent

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

Soil Properties and Qualities

Available water capacity: About 10.8 inches to a depth of 58 inches
Cation-exchange capacity of the surface layer: 6.0 to 20 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 40 to 60 inches
Depth to the top of the seasonal high water table: 1.5 to 2.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loess and the underlying till
Permeability: Slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

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

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

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

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

Component Interpretive Groups

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

XeB2=Xenia silt loam, 2 to 6 percent slopes, eroded

Setting
Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Shoulders

Map Unit Composition
Xenia and similar components: 85 percent

Contrasting Components
Miamian soils: 10 percent
Celina soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 8.2 inches to a depth of 44 inches
Cation-exchange capacity of the surface layer: 5.0 to 19 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 40 to 60 inches
Depth to the top of the seasonal high water table: 1.5 to 2.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: Loess and the underlying till
Permeability: Slow
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

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

Woodland

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

Building Sites

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

Septic Tank Absorption Fields

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

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.

Component Interpretive Groups

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

XfB=Xenia silt loam, bedrock substratum, 2 to 6 percent slopes

Setting
Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Summits

Map Unit Composition
Xenia and similar components: 85 percent

Contrasting Components
Wynn soils: 10 percent
Cyclone soils: 5 percent

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

Soil Properties and Qualities

Available water capacity: About 8.7 inches to a depth of 46 inches
Cation-exchange capacity of the surface layer: 6.0 to 20 meq per 100 grams
Depth class: Deep or very deep
Depth to root restrictive feature: Dense material: 40 to 60 inches
] Bedrock (paralithic): 55 to 65 inches
Depth to the top of the seasonal high water table: 1.5 to 2.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loess and the underlying till over limestone and shale
Permeability: Slow in the till substratum and slow to impermeable in the underlying bedrock
Potential frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

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

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the

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

Building Sites

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

Septic Tank Absorption Fields

The limited depth to bedrock reduces the filtering capacity of the soil and greatly increases the difficulty of proper installation of the effluent distribution lines.
The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

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

Component Interpretive Groups

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

Important Farmland

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, woodland, or other land, but it is not urban or built-up land or water areas. The soil qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

About 216,800 acres in the county, or about 79 percent of the total acreage in the county, meets the soils requirements for prime farmland as defined by the Natural Resources Conservation Service. Preble County consists of dominantly prime farmland soils, however, small areas of soils not meeting the requirements are scattered throughout the county.

A recent trend in land use in some parts of the survey area has been the loss of some prime farmland to industrial and urban uses (fig. 16). The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated .

Figure 16. Urban encroachment in an area of Crosby-Celina silt loams, 0 to 2 percent slopes, and Kokomo silty clay loam, 0 to 1 percent slopes.

The map units in the survey area that are considered prime farmland are listed in Table 5 (p.287) and Table 35 (p.622). These lists do not constitute a recommendation for a particular land use. On some soils included in the lists, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures. The extent of each listed map unit is shown in Table 4. The location is shown on the detailed soil maps. The soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."

Unique Farmland

Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops. It has the special combination of soil qualities, location, growing season, and moisture supply needed for the economic production of sustained high yields of a specific high- quality crop when treated and managed by acceptable farming methods. Examples of such crops are tree fruits, berries, and vegetables.

Unique farmland has an adequate supply of available moisture for the specific crops for which it is used because of stored moisture, precipitation, or irrigation and has a combination of soil qualities, growing season, temperature, humidity, air drainage, elevation, aspect, and other factors, such as nearness to markets, that favors the production of a specific food or fiber crop.

Lists of unique farmland are developed as needed in cooperation with conservation districts and others.

Additional Farmland of Statewide Importance

Some areas other than areas of prime farmland and unique farmland are of statewide importance in the production of food, feed, fiber, forage, and oilseed crops. The criteria used in defining and delineating these areas are determined by the appropriate state agency or agencies. Generally, additional farmland of statewide importance includes areas that nearly meet the criteria for prime farmland and that economically produce high yields of crops when treated and managed by acceptable farming methods. Some areas can produce as high a yield as areas of prime farmland if conditions are favorable. In some states additional farmland of statewide importance may include tracts of land that have been designated for agriculture by state law.

Additional Farmland of Local Importance

This land consists of areas that are of local importance in the production of food, feed, fiber, forage, and oilseed crops and are not identified as having national or statewide importance. Where appropriate, this land is identified by local agencies. It may include tracts of land that have been designated for agriculture by local ordinance.

Lists of this land are developed as needed in cooperation with conservation districts and others.

Hydric Soils

In this section, hydric soils are defined and described and the hydric soils in the survey area are listed in Table 6 (p.289).

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin and others, 1979; U.S. Army Corps of Engineers, 1987; National Research Council, 1995; Tiner, 1985). Criteria for each of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). These soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 1995). These criteria are used to identify a phase of a soil series that normally is associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 1998) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils in this survey area are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and others, 1998).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

The map units in Table 6 (p.289) meet the definition of hydric soils and, in addition, have at least one of the hydric soil indicators. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site (National Research Council, 1995; Hurt and others, 1998).

Map units that are made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

The map units, in Table 7 (p.290), in general, do not meet the definition of hydric soils because they do not have one of the hydric soil indicators. A portion of these map units, however, may include hydric soils. Onsite investigation is recommended to determine whether hydric soils occur and the location of the included hydric soils.

Soil Quality

Prepared by Natural Resources Conservation Service, Soil Quality Institute, Ames, Iowa.

SOIL QUALITY is how well soil does what we want it to do. More specifically, soil quality is the capacity of a specific kind of soil to function, within natural or managed ecosystem boundaries, to sustain plant and animal productivity, maintain or enhance water and air quality, and support human health and habitation.

Example of a quality soil.

People have different ideas of what a quality soil is. For example: for people active in production agriculture, it may mean highly productive land, sustaining or enhancing productivity, maximizing profits, or maintaining the soil resource for future generations; for consumers, it may mean plentiful, healthful, and inexpensive food for present and future generations; for naturalists, it may mean soil in harmony with the landscape and its surroundings; for the environmentalist, it may mean soil functioning at its potential in an ecosystem with respect to maintenance or enhancement of biodiversity, water quality, nutrient cycling, and biomass production.

What Does Soil Do?

Healthy soil gives us clean air and water, bountiful crops and forests, productive rangeland, diverse wildlife, and beautiful landscapes. Soil does all this by performing five essential functions:

- Regulating water. Soil helps control where rain, snowmelt, and irrigation water goes. Water and dissolved solutes flow over the land or into and through the soil.
- Sustaining plant and animal life. The diversity and productivity of living things depends on soil.
- Filtering potential pollutants. The minerals and microbes in soil are responsible for filtering, buffering, degrading, immobilizing, and detoxifying organic and inorganic materials, including industrial and municipal by-products and atmospheric deposits.
- Cycling nutrients. Carbon, nitrogen, phosphorus, and many other nutrients are stored, transformed, and cycled through soil.
- Supporting structures. Buildings need stable soil for support, and archeological treasures associated with human habitation are protected in soils.

Here are some examples of indicators of soil quality:

Indicator	Relationship to Soil Health
Soil organic matter (SOM)	Soil fertility, structure, stability, nutrient retention; soil erosion.
PHYSICAL: Soil structure, depth of soil, Infiltration and bulk density; water holding capacity	Retention and transport of water and nutrients; habitat for microbes; estimate of crop productivity potential; compaction, plow pan, water movement; porosity; workability.
CHEMICAL: pH; electrical conductivity; extractable N-P-K	Biological and chemical activity thresholds; plant and microbial activity thresholds; plant available nutrients and potential for N and P loss.
BIOLOGICAL: Microbial biomass C and N; potentially mineralizable N; soil respiration.	Microbial catalytic potential and repository for C and N; soil productivity and N supplying potential; microbial activity measure

Soil Has Both Inherent and Dynamic Quality.

Inherent soil quality is a soil's natural ability to function. For example, sandy soils drain faster than clayey soils. Deep soils will have more room for roots than soils with bedrock near the surface. These characteristics do not change easily.

Dynamic soil quality is how soil changes depending on how it is managed. Management choices affect the amount of soil organic matter, soil structure, soil depth, water and nutrient holding capacity. One goal of soil quality research is to learn how to manage soil in a way that improves soil function. Soils respond differently to management depending on the inherent properties of the soil and the surrounding landscape.

Soil Quality is Linked to Sustainability.

Understanding soil quality means assessing and managing soil so that it functions optimally now and is not degraded for future use. By monitoring changes in soil quality, a land manager can determine if a set of practices are sustainable.

Assessing Soil Quality

Soil quality is an assessment of how well soil performs all of its functions. It cannot be determined by measuring only crop yield, water quality, or any other single outcome. The quality of a soil is an assessment of how it performs all of its functions now and how those functions are being preserved for future use.

Soil quality cannot be measured directly, so we evaluate indicators. Indicators are measurable properties of soil or plants that provide clues about how well the soil can function. Indicators can be physical, chemical, and biological characteristics.

Useful indicators :

- are easy to measure
- measure changes in soil functions
- encompass chemical, biological, and physical properties
- are accessible to many users and applicable to field conditions
- are sensitive to variations in climate and management.

Indicators can be assessed by qualitative or quantitative techniques. After measurements are collected, they can be evaluated by looking for patterns and comparing results to measurements taken at a different time or field.

Soil Quality is Not an End in Itself.

The ultimate purpose of researching and assessing soil quality is not to achieve high aggregate stability, biological activity, or some other soil property. The purpose is to protect and improve long-term agricultural productivity, water quality, and habitats of all organisms including people. We use soil characteristics as indicators of soil quality, but in the end, soil quality must be identified by how it performs its functions.

Managing for Soil Quality

Each combination of soil type and land use calls for a different set of practices to enhance soil quality. Yet, several principles apply in most situations.

1. Add organic matter. Regular additions of organic matter are linked to many aspects of soil quality. Organic matter may come from crop residues at the surface, roots of cover crops, animal manure, green manure, compost, and others. Organic matter, and the organisms that eat it, can improve water holding capacity, nutrient availability, and can help protect against erosion.

2. Avoid excessive tillage. Tillage has positive effects, but it also triggers excessive organic matter degradation, disrupts soil structure, and can cause compaction. For more information about conservation tillage, visit the Conservation Tillage Information Center site.

3. Carefully manage fertilizer and pesticide use. In this century, pesticides and chemical fertilizers have revolutionized U.S. agriculture. In addition to their desired effects, they can harm non-target organisms and pollute water and air if they are mismanaged. Nutrients from organic sources also can become pollutants when misapplied or over-applied. On the positive side, fertilizer can increase plant growth and the amount of organic matter returned to the soil.

4. Increase ground cover. Bare soil is susceptible to wind and water erosion, and to drying and crusting. Ground cover protects soil, provides habitats for larger soil organisms, such as

insects and earthworms, and can improve water availability. Cover crops, perennials, and surface residue increase the amount of time that the soil surface is covered each year.

5. Increase plant diversity. Diversity is beneficial for several reasons. Each crop contributes a unique root structure and type of residue to the soil. A diversity of soil organisms can help control pest populations, and a diversity of cultural practices can reduce weed and disease pressures. Diversity across the landscape and over time can be increased by using buffer strips, small fields, contour strip cropping, crop rotations, and by varying tillage practices. Changing vegetation across the landscape or over time increases plant diversity, and the types of insects, microorganisms, and wildlife that live on your farm.

Use and Management of the Soils

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

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

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

Interpretative ratings help engineers, planners, and others understand how soil properties influence important nonagricultural uses, such as building site development and construction materials. The ratings indicate the most restrictive soil features affecting the suitability of the soils for these uses.

Soils are rated in their natural state. No unusual modification of the soil site or material is made other than that which is considered normal practice for the rated use. Even though soils may have limitations, it is important to remember that engineers and others can modify soil features or can design or adjust the plans for a structure to compensate for most of the limitations. Most of these practices, however, are costly. The final decision in selecting a site for a particular use generally involves weighing the costs of site preparation and maintenance.

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

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

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

The classification of the soils in this survey area are shown in Table 34 (p.621). The extent of the soils are shown in Table 4 (p.285).

Interpretive Ratings

The interpretive tables in this survey rate the soils in the survey area for various uses. Many of the tables identify the limitations that affect specified uses and indicate the severity of those limitations. The ratings in these tables are both verbal and numerical.

Rating Class Terms

Rating classes are expressed in the tables in terms that indicate the extent to which the soils are limited by all of the soil features that affect a specified use or in terms that indicate the suitability of the soils for the use. Thus, the tables may show limitation classes or suitability classes. Terms for the limitation classes are not limited, somewhat limited, and very limited. The suitability ratings are expressed as well suited, moderately suited, poorly suited, and unsuited or as good, fair, and poor.

Numerical Ratings

Numerical ratings in the tables indicate the relative severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use and the point at which the soil feature is not a limitation. The limitations appear in order from the most limiting to the least limiting. Thus, if more than one limitation is identified, the most severe limitation is listed first and the least severe one is listed last.

Cropland Limitations and Hazards

The management concerns affecting the use of the detailed map units in the survey area for crops are shown in Table 8 (p.293). The main concerns in managing nonirrigated cropland are controlling flooding and water erosion, preventing groundwater pollution, removing excess water, reducing surface crusting, reducing compaction, and maintaining soil tilth, organic matter, and fertility.

Generally, a combination of several practices is needed to control water erosion. Conservation tillage, stripcropping, contour farming, conservation

cropping systems, crop residue management, diversions, and grassed waterways help to prevent excessive soil loss.

Surface and/or subsurface drainage is used to remove excess water, lower seasonal high water tables, and to reduce ponding.

A surface crust forms in tilled areas after hard rains and may inhibit seedling emergence. Regular additions of crop residue, manure, or other organic materials help to improve soil structure and minimize crusting.

Tilling within the proper range in moisture content minimizes compaction.

Measures that are effective in maintaining soil tilth, organic matter, and fertility include applying fertilizer, both organic and inorganic, including manure; incorporating crop residue or green manure crops into the soil; and using proper crop rotations. Controlling erosion helps to prevent the loss of organic matter and plant nutrients and thus helps to maintain productivity, although the level of fertility can be reduced even in areas where erosion is controlled. All soils used for nonirrigated crops respond well to applications of fertilizer.

Some of the limitations and hazards shown in the table cannot be easily overcome. These are flooding, ponding, slope, limited organic matter content, and depth to bedrock.

Flooding.—Flooding can damage winter grain and forage crops. A tillage method that partly covers crop residue and leaves a rough or ridged surface helps to prevent removal of crop residue by floodwater. Tilling and planting should be delayed in the spring until flooding is no longer a hazard.

Ponding.—Surface drains helps to remove excess surface water and reduce damage from ponding.

Slope.—Where the slope is more than 25 percent, water erosion is excessive. The selection of crops and use of equipment is limited. Cultivation may be restricted.

Limited organic matter content.—Many soils that have a light colored surface layer have a low or moderately low organic matter content and weak or moderate structure. Regularly adding crop residue, manure, and other organic matter materials to the soil maintains or improves the organic matter content and the soil structure.

Depth to bedrock.—Rooting depth and available moisture may be limited by bedrock within a depth of 40 inches.

Additional limitations and hazards are as follows:

Potential for groundwater pollution.—This is a hazard in soils with excessive permeability, moderately deep or shallow bedrock, or a water table within the profile.

Limited available water capacity, poor tilth, restricted permeability, and surface crusting.—These limitations can be overcome by incorporating green manure crops, manure, or crop residue into the soil; applying a system of conservation tillage; and using conservation cropping systems.

Frost action.—Frost action can damage deep rooted legumes and some small grains.

Sandy layers.—Deep leaching of nutrients and pesticides may result from sandy layers. Crops generally respond better to smaller, more frequent applications of fertilizer and lime than to one large application.

Clodding. —Clods may inhibit germination, reduce water infiltration and increase runoff.

Subsidence of the muck. —Subsidence or shrinking occurs as a result of oxidation in the muck after the soil is drained. Control of the water table by subirrigation through subsurface drain lines reduces the hazards of subsidence, burning, and soil blowing.

High clay content.—The high clay content in the soil reduces rooting depth and water movement.

Root restrictive layers.—Root restrictive layers limit root growth and water movement.

Excessive alkalinity.—High pH in the upper part of the soil may inhibit plant growth and reduce availability of potassium and micronutrients.

Excessive acidity.—Low pH in the upper part of the soil may increase concentrations of aluminum and manganese and may injure plants.

Gravelly surface.—This limitation causes rapid wear of tillage equipment. It cannot be easily overcome.

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

Following is an explanation of the criteria used to determine the limitations or hazards for cropland.

Easily eroded.—The surface K factor multiplied by the relative value of the slope is more than 2 (same as prime farmland criteria). (See Table 30 for K factors.)

Erosion hazard.—The relative value of the slope is greater than 2.

Frequent flooding.—The component of the map unit is frequently flooded.

Occasional flooding.—The component of the map unit is occasionally flooded.

Limited available water capacity.—The available water capacity calculated to a depth of 60 inches or to a root-limiting layer is 6 inches or less.

Ponding.—Ponding duration is assigned to the component of the map unit.

Ponded for extended periods.—Very long ponding duration is assigned to the component of

the map unit.

Gravelly surface. —The surface texture has flaggy, very flaggy, extremely flaggy, very gravelly, extremely gravelly, or very channery modifier.

Stony surface.—The surface texture has bouldery, very bouldery, extremely bouldery, stony, very stony, extremely stony, cobbly, very cobbly, or extremely cobbly modifier.

Sandy layers.—The family particle size is sandy, sandy or sandy-skeletal, sandy over loamy, sandy over clayey, sandy-skeletal, sandy-skeletal over clayey, or sandy-skeletal over loamy; or the subgroup is Arenic or Psammentic; or the suborder is Psamments.

Depth to bedrock.—Bedrock is at a depth of less than 40 inches.

High potential for groundwater pollution.—Hard bedrock is within a depth of 40 inches, or permeability is more than 6 inches per hour in some layer within a depth of 80 inches and is not 0.2 inch per hour or less in some layer within that depth.

Moderate potential for groundwater pollution.—An apparent water table is within a depth of 4 feet, or permeability is moderately rapid in some layer between depths of 24 and 60 inches and is not 0.2 inch per hour or less in some layer within a depth of 80 inches.

Poor tilth. —The component of the map unit is severely eroded, has less than 1 percent organic matter in the surface layer, or 35 percent or more clay in the surface layer.

Fair tilth.—The component of the map unit has a silty clay loam or clay loam surface layer and less than 35 percent clay or moderately eroded and a silt loam or loam surface texture.

Excessive acidity.—The upper range of the soil pH is less than 4.5 within 40 inches.

Excessive alkalinity.—The lower range of the soil pH is more than 7.9 within 40 inches.

Restricted permeability.—Permeability is 0.06 inches per hour or less within 40 inches and a seasonal high water table is within 18 inches.

Seasonal high water table.—The seasonal high water table is within a depth of 18 inches.

Excessive slope.—The upper slope range of the component of the map unit is more than 25 percent.

Surface crusting.—The organic matter content of the surface layer is less than or equal to 3 percent and the texture is silt loam or silty clay loam.

Surface compaction. —The component of the map unit has a silt loam, silty clay loam, clay loam, clay, or silty clay surface layer.

Frost action.—The component of the map unit has a high potential frost action.

Part of surface removed.—The surface layer of the component of the map unit is moderately eroded.

Most of surface removed.—The surface layer of the component of the map unit is severely eroded.

Subsidence of the muck. —The organic matter content of the surface layer of the component of the map unit is greater than or equal to 20 percent.

Wind erosion.—The upper range of the slope is less than or equal to 25 percent and the wind erodibility group is 1, 2, or 3. (See table 30 for wind erodibility group values.)

Clodding. —The relative value of the total clay in the surface layer is greater than 32 percent.

Root restrictive layer.—Fragipan or dense material within 40 inches.

High clay content.—A layer within 40 inches of the surface has clay content that averages between 40 and 60 percent.

Very high clay content. —A layer within 40 inches of the surface has clay content that averages more than 60 percent.

Crops and Pasture

General management needed for crops and pasture is suggested in this section. The system of land capability classification used by the Natural Resources Conservation Service is explained below.

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

Cropland Management

This section prepared with the help of Dennis Bunger, District Conservationist, Natural Resources Conservation Service.

In 1998, about 195,000 acres in Preble County were used for crops and pasture. Of this total, about 160,000 acres were used for corn and soybeans; 12,000 acres for wheat; 8000 acres in rotational hay and pasture; and 2,000 acres for permanent pasture. The rest was idle land or was used for speciality crops mainly orchards, sunflowers, and Christmas trees. Yearly fluctuations occur in the acreage devoted to each crop due to the market value and demand of each product. The trend for the future shows a continued increase in corn and soybean acres and a decrease in wheat, hay, and pasture acres.

The total acreage used for crops and pasture is gradually decreasing as more and more land is used for urban development. This soil survey can be helpful to those making land use decisions that will influence the future role of agriculture in the county.

The potential for increased agricultural production is good in the county. Extending the latest crop production technology to all of the cropland in the county can increase this production. The major management needs on the cropland are measures that **control erosion, improve drainage,** and improve or maintain **soil fertility and tilth.**

Erosion is a major problem on much of the cropland in Preble County. It is a hazard on all gently sloping to very steep soils in the county. Loss of part of the surface soil through erosion reduces soil productivity and results in deterioration of tilth. It also reduces the available water capacity of the soil while increasing the amount of sediment, herbicides, and pesticides that enter waterways and streams. The erodibility of a particular soil depends in part on the physical properties of the soil. Many of the soils in Preble County have a surface layer that is fairly high in silt content, low to moderate in organic matter content and have a clayey subsoil. For example, Crosby soils that have a higher content of silt in the surface layer are more susceptible to erosion than Miamian soils on comparable slopes and under a similar vegetative cover. The hazard of erosion on all soils increases as the percentage of slope increases. In eroded areas preparing a seedbed and tilling are difficult because part of the original friable surface layer has been removed by erosion. Such areas are common in eroded Miamian soils.

A protective plant cover increases the rate of water infiltration and reduces the runoff rate and the hazard of erosion. Keeping a plant cover on the soil for extended periods can maintain soil losses at a level that will not reduce the productivity of the soil. Including grasses and legumes in the cropping sequence reduces the risk of erosion, increases the supply of nitrogen and improves tilth.

Soil erosion also can be reduced by tillage methods that leave the entire crop residue on the surface throughout the year or incorporate part of the residue into the soil. This method of tillage is commonly referred to as conservation tillage and includes no-till planting (fig. 17), ridge-till planting, strip-till planting, and other systems that do not invert the soil but leave a protective amount of crop residue on the soil surface. Minimizing tillage and leaving crop residue on the surface increases the rate of water infiltration and reduces the hazard of erosion. No-till planting of corn and soybeans, which is common on an increasing acreage in the county, is very effective in controlling erosion on gently sloping and strongly sloping soils.

Figure 17. No-till corn in an area of Crosby-Celina silt loams, 0 to 2 percent slopes.

No-till planting is suitable on many of the soils in the county, especially the well drained soils, such as Fox, Miamian, and Ockley; and the moderately well drained soils such as Celina and Lewisburg. A good artificial surface and subsurface drainage system is needed if no-till crops are planted on very poorly drained soils, such as Kokomo and Westland. Tillage practices on almost all soils are not done on the contour because slopes are so short and irregular. Conservation tillage has become the most widely used erosion control system in the county for cropland (80). Other erosion control practices include terraces, diversions, and grassed waterways.

Terraces and diversions reduce the length of slopes and thus the risk of erosion. Many of the soils in Preble County, however, are not well suited to terraces and diversions because of irregular slopes, the terrace channels are excessively wet, and the clayey subsoils exposed in the channels following construction.

Grassed waterways are natural or constructed drainage outlets that are protected by grass cover. Natural drainage ways are the best sites for these waterways, partly because a good channel commonly can be easily crossed with farm machinery. Water and sediment control basins can be used as an alternative to grassed waterways. This practice collects surface water behind a low dam reducing the peak flow and trapping sediment. The surface water is released thorough a subsurface drain. The amount of land taken out of production is usually less where these basins are used an alternative to a grassed waterway. Grassed waterways are the most common practice used to control erosion in natural drainage ways (fig. 18).

Figure 18. Grassed waterway in an area of Kokomo silt loam, 0 to 1 percent slopes, helps to reduce erosion. Soybeans are planted in an area of Crosby-Celina silt loams, 0 to 2 percent slopes.

Information on the design of erosion control practices for each kind of soil is contained in the Technical Guide available in the local office of the Natural Resources Conservation Service.

Soil drainage is a major management need on a majority of the soils in Preble County. Crops will perform well on naturally wet soils only if the excess water is removed. The wetness results from a seasonal high water table and periodic ponding. All of the very poorly drained or poorly drained soils in the county are subject to ponding. Soils that are not drained adequately dry out and warm up very slowly in the spring. As a result, tillage and planting operations are delayed and maximum yield potentials are reduced. These very poorly drained or poorly drained soils include Cyclone, Kokomo, Lippincott, Mahalasville, Milford, Millsdale, Sloan, and Westland. Crop production is generally not possible in these soils unless artificial drainage is installed. Somewhat poorly drained soils, such as Crosby, Fincastle, Randolph, Savona, and Sugarvalley, are naturally so wet that crops are damaged during most years and planting and harvesting is delayed unless artificial drainage is installed. Surface drainage and subsurface drainage are the conservation practices used to improve the drainage on these naturally wet soils. Moderately well drained and well drained soils such as Celina and Miamian, respectively, generally do not need drainage systems. Random subsurface drains may be needed in some soils where they are prone to seeps.

Drainage is a major consideration in managing crops and pasture. Management of drainage in conformance with regulations influencing wetlands may require special permits and extra planning.

The efficiency of drainage systems varies with the different kinds of soils. According to Table 30, “Physical Properties of the Soils,” many of these wet soils have moderately slow to slow permeability. Subsurface drains should be spaced more closely in the more slowly permeable soils. Information concerning subsurface and surface drainage system design for each kind of soil is available at the Natural Resources Conservation Service office.

Protection from flooding is needed on flood plain soils such as Eel, Medway, Rossburg, Sloan, and Stonelick. Levees can be used in some areas to protect these soils from stream overflow. The risk to crops grown on flood plain soils depends on the frequency and duration of the flooding. Out-of-bank flow in these flood plains can cause severe scour erosion and deposit debris such as sand, silt, and gravel on the soil surface destroying the soil’s natural structure.

Soil fertility is a management concern for maximizing the economic return on cropland. It is affected by soil reaction, pH, and the soil's ability to supply plant nutrients. Many of the upland soils that are light colored are naturally acidic and generally have a supply of plant nutrients that is below optimum. Most of the dark colored soils like Cyclone and Kokomo are nearly neutral in reaction and contain moderate amounts of potassium. These soils are higher in organic matter than the light colored soils like Crosby and Kendallville and generally are more productive. The flood plain soils commonly have a neutral or slightly alkaline surface layer and are naturally higher in content of plant nutrients than most of the upland soils. Generally, the productivity of the flood plain soils are comparable to slightly less than the dark colored soils when all management needs are addressed. On all soils additions of lime and fertilizer should be based upon the results of soil tests, on the needs of the crop, and on realistic yield goals. Commercial fertilizer, animal manures and municipal sludge can supply sources of nutrients. Traditional broadcast applications of lime and fertilizer consist of using one rate for the entire field. Since the majority of the crop fields contain several different soils, variable rate application of nutrients based on site-specific information and soil yield potentials, may be the preferred method both agronomically and economically.

Soil tilth is another important factor affecting the germination of seeds, root development, plant growth, and the infiltration of water into the soil. Soils with good tilth are friable and porous. Soil tilth is the physical condition of a soil, and includes soil structure and soil consistence, i.e., soil tilth is a measure of a soil's ability to provide for storage and flow of soil water and air, and provide structural support for farming operations.

Root growth, biological activity, water infiltration, water-holding capacity, and seedling germination are enhanced in soils with good tilth. Most of the soils used for crop production in the county have a

surface layer of light colored silt loam that is moderate or moderately low in organic matter content. Generally, the structure of these soils is weak. Tilth in such soils may generally be adequate, but a crust forms on the soil surface during periods of intensive rainfall. The crust is hard when dry and nearly impervious to water. As a result, it reduces the rate of water infiltration, increase the runoff rate, and presents resistance to plant root and shoot growth. Soil crusts generally result in poor seed germination and poor emergence due to the dry, hard surface layer.

Additions of crop residue, barnyard manure or other organic material and conservation tillage that promote increased organic matter content help improve tilth and reduce excessive crusting. Excessive tillage that buries crop residue in light colored soils results in these soils drying out quickly and increases the likelihood of crusting. Soils that are no-till planted usually will remain moister than tilled soils due to the crop residue on the soil surface reducing crusting.

Fall plowing is generally not suitable on the light colored soils that have a silt loam surface layer because of the crust that forms in winter and spring. Many of the soils that are fall tilled are nearly as hard and dense at planting time as they were before they were fall tilled. Fall tillage is common on the poorly drained or very poorly drained, dark colored soils such as Cyclone, Kokomo, and Westland. Conservation tillage is common on the light colored soils such as Miamian and soils on more than 3 percent slopes due to the erosion hazard. Using conservation tillage and no-till in particular on the steeper sloping soils reduces soil erosion by protecting the soil's surface with crop and plant residues. Crop residue kept near the soil surface helps maintain or improve soil organic matter and promotes optimum soil moisture conditions, thereby improving soil tilth.

Cropland Limitation Ratings

The soils of the survey area are rated in table 8 according to limitations that affect their suitability for growing corn, soybeans,and wheat. 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 production of corn, soybeans, and wheat.

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, available water, root restrictive layers, erosion, and tilth. Susceptibility to flooding is considered. Soils that are subject to flooding are limited for cropland by the duration and intensity of flooding and the season when flooding occurs.

The information in table 8 can be supplemented by other information in this survey, for example, Table 9-Crop Yield Index.

Corn and soybeans require soils that are not ponded or flooded for brief periods in the spring and late fall or long periods during the summer and early fall. The soil properties that affect the growth of corn and soybeans are depth to bedrock, dense till, sand and gravel, or a fragipan, clay content, permeability, surface crusting, compaction, seasonal high water table, available water capacity, and organic matter content. Other factors that influence production of corn and soybeans include slope, erosion, tilth, and potential for ground water pollution.

Wheat is susceptible to damage from frost heave in the fall and early spring. Wheat can be damaged by flooding or ponding in fall and spring. The soil properties that affect the growth of wheat are depth to bedrock, dense till, depth to sand and gravel, or a fragipan, clay content, permeability, surface crusting, compaction, seasonal high water table, available water capacity, and. Other factors that influence production of wheat include slope, erosion, tilth, and potential for ground water pollution.

Crop Yield Index

Table 9 (p.319) is the crop yield index for Preble County. The yield index reflects the yield potential of a soil in relation to other soils in the county. It is based on yields for the most productive soil—Cyclone for corn and soybeans, and Corwin for winter wheat, receive a rating of 100, and other soils are ranked against this standard (fig. 19).

Figure 19. Harvesting corn in an area of Cyclone silt loam, 0 to 2 percent slopes.

The yields used to calculate the index values are based on using good management practices.

To calculate estimated yields, use the yield index number as a percentage, and multiply it by the crop yield in the table header. For example, to calculate estimated corn yield for EgB, multiply .70 by the corn yield in the header, which is 160. [.70] x [160] = 112 bushels of corn estimated for EgB.

To use this yield index in the future to calculate estimated yields, use current yield data.

Additional information on calculating estimated yields can be obtained from the local office of the Natural Resources Conservation Service or the Ohio State University Extension.

Land Capability Classification

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

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit.

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

Class 1 soils have slight limitations that restrict their use.

Class 2 soils have moderate limitations that restrict the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that restrict the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that restrict the choice of plants or that require very careful management, or both.

Class 5 soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, woodland, or wildlife habitat.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, woodland, or wildlife habitat.

Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, woodland, or wildlife habitat.

Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or aesthetic purposes.

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

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

Capability units are soil groups within a subclass. The soils in a capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, 2e-4 and 3e-6. These units are not given in all soil surveys.

The acreage of soils in each capability class or subclass is shown in table 10 (p.324). The capability

classification of map units in this survey area is given in the section "Detailed Soil Map Units" and in the yields table.

Pasture and Hayland Management

This section prepared with the help of Dennis Bunger, District Conservationist, Natural Resources Conservation Service.

Permanent pasture makes up approximately 6 percent of the farmland in Preble County. Hayland, in rotation with other crops, makes up an additional 5 percent of the farmland (69,80,81,85). Permanent pasture and hayland acres have declined by approximately 50 percent between 1982 and 1997. This decline is attributed mainly to the growing of more corn and soybeans, more livestock in feedlots on fewer farms, decreased dairy livestock, and increased pressure for homesites and development in rural areas.

Much of the permanent pasture is located on the more sloping land, irregularly shaped areas unsuitable for row crop farming, and occasionally flooded soils. Open woodlots also are pastured, but they generally provide poor-quality grazing because the cover of forage plants is sparse (fig. 20).

Figure 20. Pasture in an area of Xenia silt loam, 2 to 6 percent slopes. In the background is the Camden Moraine and an area of Miamian silt loam, 6 to 12 percent slopes, eroded.

Pastures predominantly contain cool season grasses such as bluegrass, orchard grass, tall fescue, and timothy. Hayland usually consists of a grass and legume mixture or pure alfalfa stand.

Most pastures are unimproved and show the results of overgrazing and little or no management. This has resulted in weedy, and in some areas, brushy low producing pastures that are more subject to increased erosion because of the sparse vegetative cover. Better nutrient, pest, and improved grazing management can in time restore these pastures to a more productive condition.

Most of the soils in the county can be used for high quality permanent pasture. The gently sloping to steep soils, such as Miamian and Milton, are moderately eroded and are typically low in fertility. Soil erosion is greatest on these moderately sloping to steep soils. Also, less water is available to plants because surface runoff is rapid to very rapid. Recommended applications of fertilizer and lime would stimulate plant growth and vigor increasing productivity.

Forage growth on gently sloping soils such as Celina, Crosby, and Miamian is generally good. The well drained or moderately well drained flood plain soils, such as Ross and Medway, are well suited to permanent pastures. These soils are naturally high in fertility, have a low erosion hazard and the flooding risk is usually greatest during late winter or early spring before grazing or forage harvesting begins.

The fertility levels of pastures and hayland should be maintained or improved according to current soil tests. This will help insure good productivity and lengthen the life of the forage stand. Weeds and brush need to be controlled by mowing, clipping, or spraying to reduce unwanted species infestation.

Many permanent pasture fields are infested with multiflora rose. Multiflora rose greatly reduces the ability of the pasture field to produce while decreasing the harvesting and grazing potential. If not treated, multiflora rose can completely overtake a pasture field.

Control of insects such as alfalfa weevil and potato leaf hopper is essential for high quality forage production. Means to control these may include timely mowing or harvesting, resistant or tolerant variety selection, and pesticides.

Timely harvesting and managed grazing is essential for the production of high-quality forage, stand survival, and erosion control. Managed intensive grazing, or MIG, is a grazing system of using many small areas or paddocks with different varietal species into which the livestock is rotated. The livestock completely graze the area, but do not over-graze, before being moved into another area. This system, although more management intensive, has been found to produce more forage, lengthen the grazing period, quicken forage recovery, and reduce soil erosion. This system would adapt to any soil suitable for pastureland, but would show the greatest agronomic and erosion benefits on the more sloping, well drained, erosion prone soils such as the Fox and Miamian.

Soils are assigned to pasture and hayland groups according to their suitability for the production for forage. The soils in each group are similar enough to be suited to the same species of grasses and legumes, have similar limitations and hazards, require similar management, and have similar

productivity levels and other responses to management.

Yield estimates for pastures are provided in table11 (p.325) 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.

Pasture and Hayland Suitability Groups

The pasture and hayland suitability group symbol for each soil is listed in each map unit description under the "Component interpretative groups" heading and in table 35 (p.622). Soils assigned the same suitability group symbol require the same general management and have about the same potential productivity. The pasture and hayland suitability groups are organized by soil characteristics and limitations. Soils on slopes greater than 25 percent are generally not recommended for pasture or hayland. The groups are defined as follows:

Group A soils have few limitations affecting the management and growth of climatically adapted plants.

Group A-1 consists of deep and very deep, well and moderately well drained soils. The available water capacity ranges from moderate to very high. Slopes range from 0 to 18 percent. Plants on these soils respond well to additions of lime. Frequent applications may be needed to maintain an adequate pH level. A low pH level in the subsoil shortens the life of some deep-rooted legumes.

Group A-2 consists of deep and very deep, well and moderately well drained soils. Available water capacity ranges from moderate to very high. Plants on these soils respond well to additions of lime. Frequent applications may be needed to maintain an adequate pH level. A low pH level in the subsoil shortens the life of some deep-rooted legumes. Slopes range from 18 to 25 percent. They may interfere with clipping, mowing, and spraying for weed control. The slopes increase the risk of erosion if the pasture is overgrazed or cultivated for reseeding. These soils are suited to no-till reseeding and interseeding.

Group A-3 consists of deep and very deep, well and moderately well drained soils. Available water capacity ranges from moderate to very high. Slopes range from 25 to 40 percent. These soils are not suited to pasture or hay, but some grass pasture is produced.

Group A-4 consists of deep and very deep, well and moderately well drained soils that have stones or boulders on the surface that are extensive enough to preclude the use of hay making equipment. Slopes range from 0 to 40 percent.

Group A-5 consists of well and moderately well drained soils that are subject to flooding. Grazing is limited during periods of stream overflow. The floodwater deposits sediments that lower the quality of the forage. The available water capacity ranges from moderate to very high. Slopes range from 0 to 18 percent.

Group A-6 consists of deep and very deep, well and moderately well drained soils that are subject to frost action, which can damage legumes. Mixing fibrous-rooted grasses with the legumes and applying good grazing management minimize the damage caused by frost action. The available water capacity ranges from moderate to very high. Slopes range from 0 to 18 percent.

Group B soils are limited because of droughtiness.

Group B-1 consists of deep and very deep, well and moderately well drained soils. The available water capacity is low or very low and limits forage growth and production. Slopes range from 0 to 25 percent.

Group B-2 consists of deep and very deep, well and moderately well drained soils. The available water capacity is low or very low and limits forage growth and production. Slopes range from 25 to 40 percent.

Group B-3 consists of somewhat poorly drained to well drained soils that are subject to flooding. Slopes range from 0 to 6 percent.

Group B-4 consists of deep and very deep, well and moderately well drained reclaimed mine soils. The available water capacity is low or very low. Slopes range from 0 to 25 percent. The substratum contains a high percentage of rock fragments. The rooting zone is 20 to 30 inches deep.

Group C soils are wet because of a seasonal high water.

Group C-1 consists of deep and very deep somewhat poorly drained, poorly drained, and very poorly drained soils. These soils normally respond well to subsurface drainage. Slopes range from 0 to 12 percent.

Group C-2 consists of deep and very deep somewhat poorly drained, poorly drained, and very poorly drained soils. The seasonal high water table limits the rooting depth of deep-rooted forage plants. Shallow-rooted species grow best on these soils. Subsurface drains are used to lower the seasonal high water table. The effectiveness of subsurface drainage is usually limited by permeability of the subsoil, high amounts of clay in the subsoil, or a fragipan. Because of the limited root zone,

these soils are better suited to forage species that do not have a taproot than to other species. Slopes range from 0 to 12 percent.

Group C-3 consists of somewhat poorly drained, poorly drained, and very poorly drained soils that are subject to flooding. Grazing is limited during periods of stream overflow. The available water capacity ranges from moderate to very high. Slopes range from 0 to 6 percent. The seasonal high water table limits the rooting depth of forage plants. Shallow-rooted species grow best on these soils.

Group D soils have a high organic matter content.

Group D-1 consists of soils formed entirely or partially in organic material. Slope is 0 to 2 percent.

Group E consists of shallow soils in which the root zone is less than 20 inches deep.

Group E-1 consists of soils that are shallow or very shallow. The available water capacity is low or very low. It restricts forage production. These soils are well suited to native warm-season grasses. Slopes range from 0 to 25 percent.

Group E-2 consists of soils that have are shallow and very shallow or have a high bulk density and cobbles and stones in the upper part. The available water capacity is low or very low. Slopes range from 25 to 40 percent. Shallow-rooted species should be selected for planting.

Group E-3 soils have a high bulk density and cobbles and stones in the upper part. The available water capacity is low or very low. Slopes range from 0 to 25 percent.

Group F consists of soils that have a root zone that extends to a depth of 20 to 40 inches. These soils are better suited to forage species that do not have a taproot than to other species.

Group F-1 consists of moderately deep, well and moderately well drained soils. Slopes range from 0 to 25 percent.

Group F-2 consists of moderately deep, well and moderately well drained soils. Slopes range from 25 to 40 percent. This group generally is not suited to hay.Group F-3 consists of well and moderately well drained soils that are moderately deep to a fragipan. Slopes range from 0 to 25 percent.

Group F-4 consists of well and moderately well drained soils that are moderately deep to a fragipan. Slopes range from 25 to 40 percent.

Group F-5 consists of well and moderately well drained soils with high bulk density, a high clay content, slow permeability or a combination of these factors in the subsoil that restrict rooting depth. Slopes range from 0 to 25 percent.

Group F-6 consists of well and moderately well drained soils with high bulk density, a high clay content, slow permeability or a combination of these factors in the subsoil that restrict rooting depth. Slopes range from 25 to 40 percent.

Group F-7 consists of somewhat poorly drained, poorly drained, and very poorly drained soils with a high clay content and very slow permeability in the subsoil that restrict rooting depth. Slopes range from 0 to 12 percent.

Group G soils have chemical properties that are unfavorable for many climatically adapted plants.

Group G-1 consists of well and moderately well drained soils that are shallow or moderately deep to toxic spoil from surface mine operations. Available water capacity is low or very low in the root zone. Slopes range from 0 to 25 percent.

Group G-2 consists of well and moderately well drained soils that are shallow or moderately deep to toxic spoil from surface mine operations. Slopes range from 25 to 40 percent.

Group H soils are toxic or too steep for forage production.

Group H-1 consists of soils toxic materials from surface mining operation or on slopes greater than or equal to 40 percent. These soils generally are unsuited to pasture and hay.

Woodland Management and Productivity

Chris Hodgson, service forester with Ohio Department of Natural Resources, Division of Forestry, helped prepare this section.

Before the early settlers arrived, Preble County was almost entirely covered with a mixed hardwood forest. After almost 200 years of woodland clearing and development, only 25,000 acres, or 10 percent of the county, remain wooded (76).

Most of the county’s forests are owned by non-industrial forest owners. Approximately 1,972 acres are publicly owned by Ohio Department of Natural Resources, in Hueston Woods State Park and Rush Run Wildlife Area.

Preble County's forest cover is generally located along major creeks, intermittent streams and drainageways. These riparian forests serve as buffers, filtering sediment from adjoining crop fields thus protecting water quality. The lower reaches of Seven Mile, Four Mile and Twin Creeks contain the largest block of contiguous forest cover due to the steep slopes adjacent to these watercourses. Small isolated woodlands are scattered throughout the county's western townships. They are typically

located on poorly drained sites or on areas of the farm with poor accessibility (76).

For silviculture discussions three major type groups can be recognized. These are (1) mixed hardwoods, (2) elm-ash-maple, and (3) eastern red cedar. These are the three of the five major type groups found throughout the Central Region of the United States (21,62,71,73).

The Mixed Hardwoods Type Group is often called "Mixed Mesophytic." The principal species are sugar maple, beech, elm, ash, and yellow popular; associated species include basswood, black walnut, oak and hickory (21,71,73).

Along major streams in the county, the Elm-Ash-Maple Type Group, which is often called “Bottomland Hardwoods”, occurs. Tree species within this group include American elm, red maple, silver maple, cottonwood, sycamore, and box elder. Green ash, willow, black walnut, and mixed oaks are minor components of the forest cover.

The Eastern Red Cedar Group is of small economic consequence in Preble County. Red cedar occurs in either poor stands or is mixed with hardwoods in Gratis and Somers Townships. Sites which are severely eroded, slightly acidic, and infertile are well suited to the establishment of red cedar.

The variability of woodland composition and productivity is largely based on soils. The factors that influence tree growth are similar to those influencing the production of annual crops and pasture. The major difference is that tree roots extend deeper into the subsoil, utilizing areas between rock fragments. Soil depths, soil texture, fertility, slope, and past erosion are major components impacting tree growth and woodland development (74).

Site index is a measurement of forest soils productivity. It is based on height growth which average dominant trees attain on different soil types at an arbitrary standard age (62,74). For the Central Hardwood region, the standard age is 50. For example, when a soil type has a site index of 80, this means the average dominant trees will attain a height of 80 feet at age 50. Obviously the higher the site index, the more productive the soil.

In the past, timber stands were abused from indiscriminate logging practices. "High grading" was a common harvesting technique. Only the high quality and valuable species were cut from the stand. Poorly formed trees, low quality trees, hollow trees and species of trees of non-merchantable value were left in the woods. These "culls" provided the seed for the next generation of trees, often proliferating their inferior genetic characteristics.

Woodlands were commonly pastured. This practice was and still is detrimental to the forest's health. Grazing compacts the soil, destroys herbaceous plants and tree seedlings, and degrades the commercial value of the sawtimber. As a result, the natural succession of plant communities is disrupted and trees become predisposed to insect and disease.

Good timber management and silvicultural timber harvesting can be gained through the use of timber stand improvement,(TSI.), and by implementing acceptable harvesting methods. TSI practices involve thinning, controlling vines, and are applied to younger stands as an intermediate cut. Harvesting systems such as clearcuts or selection cuts dictate how the forest regenerates and with what species. The use of these systems depends on timber stand age, timber type, quality and condition of the trees, soil type and aspect of the growing site.

Soil erosion is a concern when harvesting timber. Potential problem areas are skid trails, logging roads, and staging areas. Poorly designed logging roads and stream crossings contribute to erosion and siltation of creeks. Best management oractices (BMPs) may include constructing waterbars on steep logging roads and seeding down roads and landings upon completion of the harvest.

Recent trends indicate an increased interest in tree planting. White pine is the preferred conifer species since it is well suited to most soil types in Preble County. Black walnut, red oak, and ash are being planted on the better sites. Reforestation projects generally involve small acreage targeted to fields that are either too small or inaccessible to farm. As the county continues to develop for housing, tree planting is a plausible land use for tracts containing less than 10 acres.

All trees have specific site requirements. Planting trees off site will impact survival and growth rate. Many of the soils in the county can produce more and better quality wood products than are currently being produced. A general knowledge of forest management practices and a willingness to implement the methods will enhance timber growth and quality, and control forest competition. The Ohio Department of Natural Resources, Division of Forestry, Division of Soil and Water Conservation, Ohio State University Extension, Farm Services Agency, and the Natural Resources Conservation Service are just a few agencies which provide woodland management information.

The tables in this section can help woodland owners or managers plan the use of soils for wood crops. They show the potential productivity of the soils for wood crops and rate the soils according to the limitations that affect various aspects of woodland management.

Woodland Management

In Table 12 (p.331), Table 13(p.339), and Table 14 (p.360), interpretive ratings are given for various aspects of woodland management. The ratings are both verbal and numerical.

Some rating class terms indicate the degree to which the soils are suited to a specified woodland management practice. *Well suited* indicates that the soil has features that are favorable for the specified practice and has no limitations. Good performance can be expected, and little or no maintenance is needed. *Moderately suited* indicates that the soil has features that are moderately favorable for the specified practice. One or more soil properties are less than desirable, and fair performance can be expected. Some maintenance is needed. *Poorly suited* indicates that the soil has one or more properties that are unfavorable for the specified practice. Overcoming the unfavorable properties requires special design, extra maintenance, and costly alteration. *Unsuited* indicates that the expected performance of the soil is unacceptable for the specified practice or that extreme measures are needed to overcome the undesirable soil properties.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified woodland management practice (1.00) and the point at which the soil feature is not a limitation (0.00).

Rating class terms for fire damage and seedling mortality are expressed as *low, moderate,* and *high*. Where these terms are used, the numerical ratings indicate gradations between the point at which the potential for fire damage or seedling mortality is highest (1.00) and the point at which the potential is lowest (0.00).

The paragraphs that follow indicate the soil properties considered in rating the soils for woodland management practices. More detailed information about the criteria used in the ratings is available in the "National Forestry Manual," which is available in local offices of the Natural Resources Conservation Service or on the Internet .

Ratings in the column *erosion hazard* are based on slope and on soil erodibility factor K. The soil loss is caused by sheet or rill erosion in off-road or off-trail areas where 50 to 75 percent of the surface has been exposed by logging, grazing, mining, or other kinds of disturbance. The hazard is described as slight, moderate, severe, or very severe. A rating of *slight* indicates that erosion is unlikely under ordinary climatic conditions; *moderate* indicates that some erosion is likely and that erosion-control measures may be needed; *severe* indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised; and *very severe* indicates that significant erosion is expected, loss of soil productivity and off–site damage are likely, and erosion–control measures are costly and generally impractical.

Ratings in the column *seedling mortality* are based on flooding, ponding, depth to a water table, content of lime, reaction, salinity, available water capacity, soil moisture regime, soil temperature regime, aspect, and slope. The soils are described as having a low, moderate, or high potential for seedling mortality.

Ratings in the column *soil rutting hazard* are based on depth to a water table, rock fragments on or below the surface, the Unified classification, depth to a restrictive layer, and slope. Ruts form as a result of the operation of woodland equipment. The hazard is described as slight, moderate, or severe. A rating of *slight* indicates that the soil is subject to little or no rutting, *moderate* indicates that rutting is likely, and *severe* indicates that ruts form readily.

For *limitations affecting construction of haul roads and log landings*, the ratings are based on slope, flooding, permafrost, plasticity index, the hazard of soil slippage, content of sand, the Unified classification, rock fragments on or below the surface, depth to a restrictive layer that is indurated, depth to a water table, and ponding. The limitations are described as slight, moderate, or severe. A rating of *slight* indicates that no significant limitations affect construction activities, *moderate* indicates that one or more limitations can cause some difficulty in construction, and *severe* indicates that one or more limitations can make construction very difficult or very costly.

Ratings in the column *suitability for roads (natural surface)* are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification, depth to a water table, ponding, flooding, and the hazard of soil slippage. The ratings indicate the suitability for using the natural surface of the soil for roads. The soils are described as well suited, moderately suited, or poorly suited to this use.

Ratings in the column *harvest equipment operability* are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification, depth to a water table, and ponding. The soils are described as well suited, moderately suited, or poorly suited to this use.

Ratings in the column *suitability for mechanical planting* are based on slope, depth to a restrictive layer, content of sand, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, moderately suited, poorly suited, or unsuited to these methods of planting. It is assumed that necessary site preparation is completed before seedlings are planted.

Ratings in the column *suitability for site preparation* are based on slope, depth to a restrictive layer, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsuited to this management activity. The part of the soil from the surface to a depth of about 1 foot is considered in the ratings.

Ratings in the column *potential for damage to soil by fire* are based on texture of the surface layer, content of rock fragments and organic matter in the surface layer, thickness of the surface layer, and slope. The soils are described as having a low, moderate, or high potential for this kind of damage. The ratings indicate an evaluation of the potential impact of prescribed fires or wildfires that are intense enough to remove the duff layer and consume organic matter in the surface layer.

Woodland Productivity

In table 13 (p.339), the *potential productivity* of merchantable or *common trees* on a soil is expressed as a site index and as a volume number. The *site index* is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability. More detailed information regarding site index is available in the "National Forestry Manual," which is available in local offices of the Natural Resources Conservation Service or on the Internet.

The *volume of wood fiber*, a number, is the yield likely to be produced by the most important tree species. This number, expressed as cubic feet per acre per year and calculated at the age of culmination of the mean annual increment (CMAI), indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

Trees to manage are those that are preferred for planting, seeding, or natural regeneration and those that remain in the stand after thinning or partial harvest.

Windbreaks and Environmental Plantings

Farm and homestead windbreaks are rows of trees or shrubs established adjacent to farm buildings, feedlots, and homes. These windbreaks are usually planted perpendicular to the prevailing winter wind. Planting multiple rows of various species provides the best protection from winds and results in more varied wildlife habitat. Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil.

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

Table 16 (p. 383) shows the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates in table 16 are based on measurements and observation of established plantings that have been given adequate care. They can be used as a guide in planning windbreaks and screens. Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from the local office of the Natural Resources Conservation Service, the Ohio Department of Natural Resources, Division of Forestry, or of the Cooperative Extension Service or from a commercial nursery.

Recreational Development

Preble County has many recreational areas which include Hueston Woods State Park located in the southwest corner of Preble County and covers 3,596 acres of land and 625 acres of water. The excellent facilities here provide for a variety of recreational interests (fig. 21).

Figure 21. Hueston Woods State Park Lodge overlooking Acton Lake. The lodge is in an area of Miamian silt loam, 6 to 12 percent slopes, eroded, and Hennepin-Miamian silt loams, 25 to 50 percent slopes, eroded.

Rush Run Wildlife Area is also located in the southern part of the county. It covers an area of rolling terrain, woodland and grassland and is excellent for wildlife habitat. Rush Run Lake offers water recreation opportunities.

The soils of the survey area are rated in Table 17

(p.394) and Table 18 (p.407) according to limitations that affect their suitability for recreation. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the recreational uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The ratings in the tables are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation also are important. Soils that are subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

The information in Table 17 and Table 18 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.

Figure 22. Golf course in an area of Russell-Miamian silt loams, 2 to 6 percent slopes, in the Hueston Woods State Park.

Wildlife Habitat

Heidi C. K. Devine, Private Lands Wildlife Biologist, Ohio Department of Natural Resources, Division of Wildlife, helped prepare this section.

In Preble County, a wide variety of wildlife is supported by diverse habitat types including cropland, openland, woodland, wetland, and various bodies of water (lakes, ponds and streams). The soils influence land use and, therefore, also influence wildlife habitat. Slope, productivity potential, texture, depth, and drainage of the soil will determine how the land is used. The land use will determine the availability of wildlife habitat. Species such as bobwhite quail, cottontail rabbits, meadowlarks, and bobolinks that were once very common are no longer as plentiful due to changing land uses such as more intense farming on productive soils. However, the abandonment of marginal farmland has resulted in an increase of brushland and forest. The resulting habitat has been beneficial to deer, raccoons, squirrels, woodpeckers and woodland songbirds. Wild turkeys stocked in the county's habitat during the 1990's should do well.

Soil erosion caused by intensive agriculture and land development continues to be a problem in the county. This results in habitat degradation in the county's lakes, ponds, wetlands, and streams. Such erosion will have to be controlled if these bodies of water are to continue to provide aquatic wildlife habitat and public recreation.

If properly managed, the soils in the county can provide food and shelter for wildlife. Large areas of diverse habitat types provide the greatest variety of wildlife species to that area.

Habitat for wetland wildlife can be developed in undrained depressions on uplands and in old stream meanders of flood plains. Ponds also can be used as habitat for wetland wildlife. Special plantings help to attract waterfowl. Surface or subsurface drainage systems can be interrupted in such a way as to restore drained wetlands yet maintain the surrounding agricultural land. Farmed

hydric soils are often good candidates for wetland restoration.

The major riparian areas in the county are along streams. The dominant soils in these areas include Eel, Medway, Rossburg, Sloan, and Stonelick soils. Stabilizing streambanks, erecting nest boxes for wood ducks and planting trees and shrubs can improve the riparian habitat.

Habitat for openland wildlife can be developed in eroded areas such as marginal or abandoned pastures and cropland by planting mixtures of meadow plants or shrubs that provide food, shelter, and nesting areas. Mowing meadows after the nesting season ensures higher survival rates. A good plant cover helps to control erosion.

Woodlots can be improved as habitat for woodland wildlife by maintaining den trees and trees that produce nuts and berries. The plantings along streams or in corridors connecting two or more wooded tracts improve habitat for woodland species. Woodlands are often the best use of marginal cropland, abandoned pastures, and land too steep for development.

Active cropland has benefits to wildlife if properly managed. Unplowed fields provide waste grain for food. Grain or legume food plots can be planted in odd corners along woods or fence rows, or on ground that may be idle for one or more growing seasons. Hayfields provide loafing areas, feeding sites, and sometimes nesting cover if mowing is timed to benefit wildlife.

Creating special habitat through the use of artificial nesting structures, feeding stations, food

patches, and wildflowers can attract many different kinds of songbirds. Additional information about improving wildlife habitat can be obtained from the local Natural Resources Conservation Service office and from the Ohio Department of Natural Resources, Division of Wildlife.

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 19 (p.417), the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of grain and seed crops are corn, wheat, oats, soybeans, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture also are considerations. Examples of grasses and legumes are fescue, lovegrass, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, wheatgrass, and grama.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, raspberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are autumn-olive, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, wildrice, saltgrass, cordgrass, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include bobwhite quail, pheasant, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous and/or coniferous plants and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, ruffed grouse, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, and deer.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the data in the tables described under the heading "Soil Properties."

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about particle-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 7 feet of the surface, soil wetness, depth to a water table, ponding, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earth fill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

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

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

Construction Materials

Table 20 (p.424) and Table 21 p.(434) give information about the soils as potential sources of gravel, sand, topsoil, reclamation material, and roadfill. Normal compaction, minor processing, and other standard construction practices are assumed.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In table 20, only the likelihood of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material. The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the bottom layer of the soil contains sand or gravel, the soil is considered a likely source regardless of thickness. The assumption is that the sand or gravel layer below the depth of observation exceeds the minimum thickness.

The soils are rated *good, fair,* or *poor* as potential sources of sand and gravel. A rating of *good* or *fair* means that the source material is likely to be in or below the soil. The bottom layer and the thickest layer of the soils are assigned numerical ratings. These ratings indicate the likelihood that the layer is a source of sand or gravel. The number 0.00 indicates that the layer is a poor source. The number 1.00 indicates that the layer is a good source. A

number between 0.00 and 1.00 indicates the degree to which the layer is a likely source.

The soils are rated *good, fair,* or *poor* as potential sources of reclamation material, roadfill, and topsoil. The features that limit the soils as sources of these materials are specified in the tables. The numerical ratings given after the specified features indicate the degree to which the features limit the soils as sources of reclamation material, roadfill, or topsoil. The lower the number, the greater the limitation.

Reclamation material is used in areas that have been drastically disturbed by surface mining or similar activities. When these areas are reclaimed, layers of soil material or unconsolidated geological material, or both, are replaced in a vertical sequence. The reconstructed soil favors plant growth. The ratings in the table do not apply to quarries and other mined areas that require an offsite source of reconstruction material. The ratings are based on the soil properties that affect erosion and stability of the surface and the productive potential of the reconstructed soil. These properties include the content of sodium, salts, and calcium carbonate; reaction; available water capacity; erodibility; texture; content of rock fragments; and content of organic matter and other features that affect fertility.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the whole soil, from the surface to a depth of about 5 feet. It is assumed that soil layers will be mixed when the soil material is excavated and spread.

The ratings are based on the amount of suitable material and on soil properties that affect the ease of excavation and the performance of the material after it is in place. The thickness of the suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the AASHTO classification of the soil) and linear extensibility (shrink-swell potential).

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area. The ratings are based on the soil properties that affect plant growth; the ease of excavating, loading, and spreading the material; and reclamation of the borrow area. Toxic substances, soil reaction, and the properties that are inferred from soil texture, such as available water capacity and fertility, affect plant growth. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, depth to bedrock or a cemented pan, and toxic material.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Building Site Development

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. Table 22 (p.452) and Table 23 (p.465) 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 building*s are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer.

Sanitary Facilities

Table 24 (p.482) and Table 25 (p.498) show the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, sanitary landfills, and daily cover for landfill. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. Not limited indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. Somewhat limited indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. Very limited indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Septic tank absorption fields are areas in which

effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 60 inches is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in down slope areas.

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

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

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

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

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

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

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

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

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

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

seepage problems.

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

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

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

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

Agricultural Waste Management

Soil properties are important considerations in areas where soils are used as sites for the treatment and disposal of organic waste and wastewater. Selection of soils with properties that favor waste management can help to prevent environmental damage.

Table 26 (p.511) shows the degree and kind of soil limitations affecting the treatment of agricultural waste, including municipal and food-processing wastewater and effluent from lagoons or storage ponds. Municipal wastewater is the waste stream from a municipality. It contains domestic waste and may contain industrial waste. It may have received primary or secondary treatment. It is rarely untreated sewage. Food-processing wastewater results from the preparation of fruits, vegetables, milk, cheese, and meats for public consumption. In places it is high in content of sodium and chloride. In the context of these tables, the effluent in lagoons and storage ponds is from facilities used to treat or store food-processing wastewater or domestic or animal waste. Domestic and food-processing wastewater is very dilute, and the effluent from the facilities that treat or store it commonly is very low in content of carbonaceous and nitrogenous material; the content of nitrogen commonly ranges from 10 to 30 milligrams per liter. The wastewater from animal waste treatment lagoons or storage ponds, however, has much higher concentrations of these materials, mainly because the manure has not been diluted as much as the domestic waste. The content of nitrogen in this wastewater generally ranges from 50 to 2,000 milligrams per liter. When wastewater is applied, checks should be made to ensure that nitrogen, heavy metals, and salts are not added in excessive amounts.

The ratings in the tables are for waste management systems that not only dispose of and treat organic waste or wastewater but also are beneficial to crops (application of manure and food-processing waste, application of sewage sludge, and disposal of wastewater by irrigation) and for waste management systems that are designed only for the purpose of wastewater disposal and treatment (overland flow of wastewater, rapid infiltration of wastewater, and slow rate treatment of wastewater).

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect agricultural waste management. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Application of manure and food-processing waste not only disposes of waste material but also can improve crop production by increasing the supply of nutrients in the soils where the material is applied. Manure is the excrement of livestock and poultry, and food-processing waste is damaged fruit and vegetables and the peelings, stems, leaves, pits, and soil particles removed in food preparation. The manure and food-processing waste are either solid, slurry, or liquid. Their nitrogen content varies. A high content of nitrogen limits the application rate. Toxic or otherwise dangerous wastes, such as those mixed with the lye used in food processing, are not considered in the ratings.

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

Application of sewage sludge not only disposes of waste material but also can improve crop production by increasing the supply of nutrients in the soils where the material is applied. In the context of this table, sewage sludge is the residual product of the treatment of municipal sewage. The solid component consists mainly of cell mass, primarily bacteria cells that developed during secondary treatment and have incorporated soluble organics into their own bodies. The sludge has small amounts of sand, silt, and other solid debris. The content of nitrogen varies. Some sludge has constituents that are toxic to plants or hazardous to the food chain, such as heavy metals and exotic organic compounds, and should be analyzed chemically prior to use.

The content of water in the sludge ranges from about 98 percent to less than 40 percent. The sludge is considered liquid if it is more than about 90 percent water, slurry if it is about 50 to 90 percent water, and solid if it is less than about 50 percent water.

The ratings in the table are based on the soil properties that affect absorption, plant growth, microbial activity, erodibility, the rate at which the sludge is applied, and the method by which the sludge is applied. The properties that affect absorption, plant growth, and microbial activity include permeability, depth to a water table, ponding, the sodium adsorption ratio, depth to bedrock or a cemented pan, available water capacity, reaction, salinity, and bulk density. The wind erodibility group, the soil erodibility factor K, and slope are considered in estimating the likelihood that wind erosion or water erosion will transport the waste material from the application site. Stones, cobbles, a water table, ponding, and flooding can hinder the application of sludge. Permanently frozen soils are unsuitable for waste treatment.

Disposal of wastewater by irrigation not only disposes of municipal wastewater and wastewater from food-processing plants, lagoons, and storage ponds but also can improve crop production by increasing the amount of water available to crops. The ratings in the table are based on the soil properties that affect the design, construction, management, and performance of the irrigation system. The properties that affect design and management include the sodium adsorption ratio, depth to a water table, ponding, available water capacity, permeability, slope, and flooding. The properties that affect construction include stones, cobbles, depth to bedrock or a cemented pan, depth to a water table, and ponding. The properties that affect performance include depth to bedrock or a cemented pan, bulk density, the sodium adsorption ratio, salinity, reaction, and the cation–exchange capacity, which is used to estimate the capacity of a soil to adsorb heavy metals. Permanently frozen soils are not suitable for disposal of wastewater by irrigation.

Water Management

Table 27 (p.533) and Table 28 (p.545) give information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; aquifer-fed excavated ponds; grassed waterways; terraces and diversions; and drainage. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low

seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Figure 23. A pond constructed for a sediment basin. The trees are in an area of Miamian silt loam, 12 to 18 percent slopes, eroded.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. Embankments that have zoned construction (core and shell) are not considered. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

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

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

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

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or a cemented pan affect the construction of grassed waterways. A hazard of water erosion, low available water capacity, restricted rooting depth, toxic substances such as salts and sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind erosion or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, a cemented pan, or other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and the potential for frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, and sulfur. Availability of drainage outlets is not considered in the ratings.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey.

Soil properties are ascertained by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine particle-size distribution, plasticity, and compaction characteristics. These results are at the Ohio State University, School of Natural Resources, Columbus, Ohio; the Ohio Department of Natural Resources, Division of Soil and Water Conservation, Columbus, Ohio; and the USDA–Natural Resources Conservation Service, state office, Columbus, Ohio.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties are shown in tables. They include engineering index properties, physical and chemical properties, and pertinent soil and water features.

Physical and Chemical Analyses of Selected Soils

Many of the soils in Preble County were sampled by the Soil Characterization Laboratory, School of Natural Resources, The Ohio State University, Columbus, Ohio. The physical and chemical data obtained from the samples include particle size distribution, reaction, organic matter content, calcium carbonate content, and extractable cations.

These data were used in classifying and correlating soils and in evaluating their behavior under various land uses. Eleven pedons were selected as representative of the respective series and are described in the section titled "Soil Series and Their Morphology." These series and their laboratory identification numbers are: Morningsun (PB-72), Celina (PB-73), Sugarvalley (PB-74), Celina (PB-75), Randolph (PB-76), Kokomo (PB-77), Sugarvalley (PB-78), Rainsville (PB-79), Morningsun (PB-80), Miamian (PB-81), Miami (PB-82 and PB-83).

Figure 24. Till fractures in Miami loam, 6 to 12 percent slopes, eroded.

In addition to the data from Preble County, laboratory data are available from nearby or adjacent counties that have many of the same soils. These datasets and the data from Preble County are on file at the School of Natural Resources, The Ohio State University, Columbus, Ohio; the Ohio Department of Natural Resources, Division of Soil and Water Conservation, Columbus, Ohio; and the Natural Resources Conservation Service, State Office, Columbus, Ohio.

Engineering Index Test Data

Engineering index test data are available for several pedons from Preble County. Additional engineering index test data is also available from several nearby counties that have many of the same soils as Preble County. These soils were analyzed for engineering properties by the Ohio Department of Transportation, Division of Highways, Bureau of Testing, Soils Foundation Section. The available test data are on file at the MLRA Project Office, Wilmington, Ohio; The Ohio State University, School of Natural Resources, Columbus, Ohio; the Ohio Department of Natural Resources, Division of Soil and Water Conservation, Columbus, Ohio; and the Natural Resources Conservation Service, State Office, Columbus, Ohio.

Engineering Index Properties

Table 29 (p.561) gives the engineering classifications and the range of index properties for the layers of each soil in the survey area.

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

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are

defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter (figure 25). "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (ASTM, 2001) and the system adopted

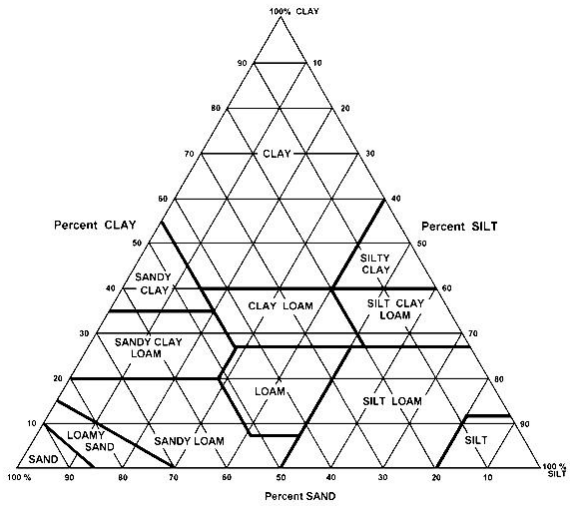


Figure 25. Textural Triangle

by the American Association of State Highway and Transportation Officials (AASHTO, 2000).

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

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.
If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in table 29.

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 30 (p.584) shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

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

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In table 30, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important

for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink–swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3- or 1/10-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink–swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates in the table indicate the rate of water movement, in inches per hour (in/hr), when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

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

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on the basis of measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air–dry to field capacity. The classes are low, a change of 3 percent; moderate, 3 to 6 percent; high, more than 6 percent; and very high, greater than 9 percent.

Erosion factors are shown in table 30 (p.584) as the K factor (Kw and Kf) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and permeability. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

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

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

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

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are as follows:

1.—Coarse sands, sands, fine sands, and very fine sands.

2.—Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, ash material, and sapric soil material.

3.—Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams.

4L.—Calcareous loams, silt loams, clay loams, and silty clay loams.

4.—Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay.

5.—Noncalcareous loams and silt loams that are

less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material.

6.—Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay.

7.—Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material.

8.—Soils that are not subject to wind erosion because of rock fragments on the surface or because of surface wetness.

Chemical Properties

Table 31 (p.596) shows estimates of some chemical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

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

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

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 31, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

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

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

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

Water Features

Table 32 (p.608) gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations.

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

The four hydrologic soil groups are:

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

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

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

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

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

The *months* in the table indicate the portion of the year in which the feature is most likely to be a concern.

Water table refers to a saturated zone in the soil. Table K1 indicates, by month, depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. Table 32 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 33 (p.615) 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 34 (p.621) shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER.—Twelve soil orders are recognized. The differences among orders reflect the dominant soil–forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Alfisol.

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

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

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

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

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

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. Pedon descriptions published in this survey come from Preble County or adjacent counties. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" (Soil Survey Division Staff, 1993). Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" (Soil Survey Staff, 1999) and in "Keys to Soil Taxonomy" (Soil Survey Staff, 1998). Unless otherwise indicated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

Celina Series

Depth class: Very deep
Drainage class: Moderately well drained
Parent material: A thin layer of loess and the underlying till
Landform: Flats and slight rises on the Wisconsinan till plains
Position on the landform: Summits and shoulders
Slope: 0 to 6 percent

Adjacent soils: Crosby, Kokomo, Lewisburg, Losantville, and Miamian

Taxonomic class: Fine, mixed, active, mesic Aquic Hapludalfs

Typical Pedon
Celina silt loam, 2 to 6 percent slopes, about 5 miles north and 1 mile west of Eaton, in Washington Township, Preble County, Ohio; about 1,500 feet

west and 300 feet north of the southeast corner of sec. 4, T. 8 N., R. 2 E.

Ap1=0 to 4 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine and medium granular structure; friable; common fine roots; 1 percent rock fragments; neutral; clear smooth boundary.

Ap2=4 to 9 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine and medium subangular blocky structure; friable; common fine roots; 1 percent rock fragments; slightly acid; clear wavy boundary.

Bt1=9 to 16 inches; yellowish brown (10YR 5/4) clay loam; moderate fine and medium subangular blocky structure; firm; few fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; few distinct dark grayish brown (10YR 4/2) organic coatings along root channels; few faint brown (10YR 5/3) clay depletions on faces of peds; common fine prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; few fine distinct black (10YR 2/1) manganese concretions in the matrix; 1 percent rock fragments; neutral; clear wavy boundary.

Bt2=16 to 22 inches; yellowish brown (10YR 5/4) clay loam; moderate medium subangular blocky structure; firm; few fine roots; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; few fine distinct black (10YR 2/1) manganese concretions in the matrix; 1 percent rock fragments; neutral; clear smooth boundary.

Bt3=22 to 28 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium and coarse subangular blocky structure; firm; few fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; few fine prominent yellowish brown (10YR 5/8) masses of iron accumulation in ped interiors; few fine distinct black (10YR 2/1) manganese concretions in the matrix; 1 percent rock fragments; neutral; clear wavy boundary.

Bt4=28 to 32 inches; yellowish brown (10YR 5/4) loam; moderate fine and medium subangular blocky structure; firm; few fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; common fine prominent yellowish brown (10YR 5/8) masses of iron accumulation on faces of peds; few fine distinct black (10YR 2/1) manganese concretions in the matrix; 1 percent rock fragments; neutral; clear wavy boundary.

BC=32 to 38 inches; yellowish brown (10YR 5/4) silt loam; weak fine and medium subangular blocky structure; friable; few distinct dark grayish brown (10YR 4/2) clay films on vertical faces of peds; few distinct gray (10YR 6/1) carbonate coatings on faces of peds; common fine distinct light brownish gray (10YR 6/2) iron depletions along vertical faces of peds; common fine and medium prominent brownish yellow (10YR 6/8) masses of iron accumulation along vertical faces of peds; few fine distinct black (10YR 2/1) masses of manganese accumulation in the matrix; 5 percent rock fragments; slightly effervescent; slightly alkaline; gradual wavy boundary.

Cd1=38 to 50 inches; brown (10YR 5/3) loam; massive; firm; common medium faint grayish brown (10YR 5/2) iron depletions along vertical fractures; few fine prominent yellowish red (5YR 4/6) masses of iron accumulation along vertical fractures; few prominent white (10YR 8/1) calcium carbonate coatings along vertical fractures; 4 percent rock fragments; strongly effervescent; moderately alkaline; gradual wavy boundary.

Cd2=50 to 80 inches; brown (10YR 5/3) loam; massive; very firm; common medium faint grayish brown (10YR 5/2) iron depletions along vertical fractures; few fine and medium prominent yellowish red (5YR 4/6) masses of iron accumulation in the matrix; few prominent light gray (10YR 7/1) calcium carbonate coatings along vertical fractures; 4 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics
Thickness of the solum: 20 to 40 inches
Depth to carbonates: 18 to 40 inches
Thickness of the loess mantle: 0 to 18 inches
Content of rock fragments: Ap horizon or Bt horizon formed in loess=0 to 2 percent; Bt or 2Bt horizon formed in till=1 to 10 percent; BC or 2BC horizon=2 to 10 percent; Cd or 2Cd horizon=3 to 10 percent

Ap horizon:
Color=hue of 10YR, value of 4, chroma of 2 or 3
Texture=silt loam or clay loam

Bt horizon formed in loess, where present:
Color=hue of 10YR, value of 4 or 5, chroma of 3 or 4
Texture=silt loam or silty clay loam

Bt or 2Bt horizon formed in till:
Color=hue of 10YR, value of 4 or 5, chroma of 3 or 4
Texture=clay loam, silty clay loam, or loam

BC or 2BC horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 3 or 4
Texture=clay loam or silt loam

Cd or 2Cd horizon:
Color=hue of 10YR or 2.5Y, value of 4 or 5, chroma of 3 or 4
Texture=loam or silt loam

The Celina soils in Preble County are a taxadjunct to the Celina series because they have less clay in the particle-size control section than defined for the series. They classify as fine-loamy, mixed, active, mesic Aquic Hapludalfs. This difference, however, does not significantly affect the use and management of the soils.

Corwin Series

Depth class: Very deep
Drainage class: Moderately well drained
Parent material: A thin layer of loess and the underlying till
Landform: Flats on the Wisconsinan till plains
Position on the landform: Summits
Slope: 0 to 2 percent
Adjacent soils: Crosby, Kokomo, Celina, and Miamian

Taxonomic class: Fine-loamy, mixed, active, mesic Oxyaquic Argiudolls

Typical Pedon
Corwin silt loam, 0 to 2 percent slopes, about 2.5 miles east of Camden in Somers Township, Preble County, Ohio; about 1,200 feet south and 2,600 feet west of the northeast corner of sec. 12, T. 6 N., R. 2 E.

Ap=0 to 11 inches; very dark gray (10YR 3/1) unrubbed, very dark grayish brown (10YR 3/2) crushed, and dark brown (10YR 3/3) rubbed, silt loam, grayish brown (10YR 5/2) dry; weak fine and medium granular structure; friable; many fine and medium roots; slightly acid; abrupt smooth boundary.

Bt1=11 to 18 inches; yellowish brown (10YR 5/4) clay loam; moderate fine and medium subangular blocky structure; firm; common fine and medium roots; many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; many distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds and in root channels; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine distinct black (10YR 2/1) masses of manganese accumulation in the matrix; 1 percent rock fragments; slightly acid; clear smooth boundary.

Bt2=18 to 27 inches; yellowish brown (10YR 5/4) clay loam; moderate medium subangular blocky structure; firm; few fine roots; many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds and in root channels; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine distinct black (10YR 2/1) masses of manganese accumulation in the matrix; 1 percent rock fragments; neutral; clear wavy boundary.

Bt3=27 to 33 inches; yellowish brown (10YR 5/4) clay loam; moderate medium subangular blocky structure; firm; few fine roots; many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds and in root channels; common fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine distinct black (10YR 2/1) masses of manganese accumulation in the matrix; 3 percent rock fragments; neutral; clear wavy boundary.

BC=33 to 38 inches; yellowish brown (10YR 5/4) clay loam; weak coarse subangular blocky structure; firm; common fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine distinct black (10YR 2/1) masses of manganese accumulation in the matrix; 5 percent rock fragments and soft limestone; slightly effervescent; slightly alkaline; gradual wavy boundary.

Cd=38 to 80 inches; brown (10YR 5/3) loam; massive; very firm; common fine faint grayish brown (10YR 5/2) iron depletions throughout; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation throughout; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; common fine distinct gray (10YR 6/1) masses of calcium carbonate accumulation throughout; 10 percent rock fragments and soft limestone; strongly effervescent; moderately alkaline.

Range in Characteristics
Thickness of the solum: 24 to 40 inches

Thickness of the mollic epipedon: 10 to 14 inches
Depth to carbonates: 20 to 35 inches
Thickness of the loess mantle: 0 to 14 inches
Content of rock fragments: Ap horizon=0 to 2 percent; Bt horizon=1 to 10 percent; BC horizon=5 to 10 percent; Cd horizon=5 to 10 percent

Ap horizon:
Color=hue of 10YR, value of 2 or 3, chroma of 1 to 3
Texture=silt loam

Bt horizon:
Color=hue of 7.5YR to 2.5Y, value of 4 or 5, chroma of 3 to 6
Texture=loam and clay loam

BC horizon:
Color=hue of 10YR or 2.5Y, value of 4 or 5, chroma of 3 to 6
Texture=clay loam, loam, or silt loam

Cd horizon:
Color=hue of 10YR or 2.5Y, value of 4 or 5, chroma of 3 to 6
Texture=loam or silt loam

Crosby Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Parent material: A thin layer of loess and the underlying till
Landform: Flats and slight rises on the Wisconsinan till plains
Position on the landform: Summits
Slope: 0 to 4 percent
Adjacent soils: Celina, Kokomo, Lewisburg, Losantville, and Miamian

Taxonomic class: Fine, mixed, active, mesic Aeric Epiaqualfs

Typical Pedon
Crosby silt loam, from an area of Crosby-Celina silt loams, 0 to 2 percent slopes, about 1 mile north of Verona, in Harrison Township, Preble County, Ohio; about 675 feet west and 1,120 feet south of the northeast corner of sec. 1, T. 7 N., R. 3 E.

Ap=0 to 10 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine subangular blocky structure; friable; common fine roots; few faint very dark grayish brown (10YR 3/2) organic stains on faces of peds; few fine faint black (10YR 2/1) masses of manganese accumulation in the matrix; 2 percent rock fragments; slightly acid; abrupt smooth boundary.

Bt1=10 to 18 inches; yellowish brown (10YR 5/4) clay; moderate medium and coarse subangular blocky structure; firm; common fine roots; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common medium distinct yellowish brown (10YR 5/6) and common medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common medium distinct black (10YR 2/1) masses of manganese accumulation throughout; 2 percent rock fragments; slightly acid; clear smooth boundary.

Bt2=18 to 25 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; firm; common fine roots; common distinct dark gray (10YR 4/1) and many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common medium distinct black (10YR 2/1) masses of manganese accumulation throughout; 2 percent rock fragments; neutral; clear irregular boundary.

BC=25 to 39 inches; yellowish brown (10YR 5/4) clay loam; weak thin and medium platy structure; firm; common fine roots; common prominent light gray (10YR 7/1) carbonate coatings on vertical faces of fractures; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common fine and medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common medium distinct black (10YR 2/1) masses of manganese accumulation throughout; 5 percent rock fragments; slightly effervescent; slightly alkaline; gradual irregular boundary.

Cd=39 to 80 inches; yellowish brown (10YR 5/4) loam; massive; very firm; common prominent light gray (10YR 7/1) carbonate coatings on vertical faces of fractures; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 6 percent rock fragments; strongly effervescent; slightly alkaline.

Range in Characteristics
Thickness of the solum: 24 to 40 inches
Depth to carbonates: 20 to 40 inches
Thickness of the loess mantle: 0 to 18 inches
Content of rock fragments: Ap horizon or Bt horizon formed in loess=0 to 5 percent; Bt or 2Bt horizon

formed in till=0 to 10 percent; BC or 2BC horizon=2 to 8 percent; Cd or 2Cd horizon=1 to 12 percent

Ap horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 2
Texture=silt loam

Bt horizon formed in loess, where present:
Color=hue of 10YR, value of 4 or 5, chroma of 2 to 6
Texture=silty clay loam

Bt or 2Bt horizon formed in till:
Color=hue of 10YR, value of 4 or 5, chroma of 2 to 6
Texture=silty clay loam, clay loam, silty clay, or clay

BC or 2BC horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 2 to 6
Texture=loam or clay loam

Cd or 2Cd horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 3 or 4
Texture=loam

Cyclone Series

Depth class: Very deep
Drainage class: Poorly drained
Parent material: Loess and the underlying till
Landform: Flats and depressions on the Wisconsinan till plains
Slope: 0 to 2 percent
Adjacent soils: Morningsun, Sugarvalley, Fincastle, Xenia, and Russell

Taxonomic class: Fine-silty, mixed, superactive, mesic Typic Argiaquolls

Typical Pedon

Cyclone silt loam, 0 to 2 percent slopes, about 9 miles west and 1.9 miles north of Eaton, in Jackson Township, Preble County, Ohio; about 219 feet east and 792 feet south of the northwest corner of sec. 30, T. 8 N., R. 1 E.

Ap=0 to 12 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine subangular blocky structure; friable; common fine and few medium roots; few fine faint black (10YR 2/1) manganese concretions throughout; neutral; abrupt smooth boundary.

Btg1=12 to 18 inches; gray (10YR 5/1) silty clay loam; moderate medium subangular blocky structure; firm; common fine roots; common distinct dark gray (10YR 4/1) clay films on faces of peds; few fine prominent red (2.5YR 4/6), few medium prominent yellowish red (5YR 4/6), and few medium prominent yellowish brown (10YR 5/6) masses of iron accumulation throughout; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; neutral; clear smooth boundary.

Btg2=18 to 27 inches; gray (10YR 5/1) silty clay loam; moderate medium and coarse subangular blocky structure; firm; common fine roots; common distinct dark gray (10YR 4/1) clay films on faces of peds; common medium prominent red (2.5YR 4/6) and common medium prominent dark yellowish brown (10YR 4/6) masses of iron accumulation throughout; common fine distinct black (10YR 2/1) masses of manganese accumulation throughout; neutral; clear wavy boundary.

Btg3=27 to 42 inches; grayish brown (2.5Y 5/2) silty clay loam; moderate medium prismatic structure parting to strong coarse subangular blocky; firm; few fine roots; many distinct gray (10YR 5/1) clay films on faces of prisms; common medium prominent yellowish brown (10YR 5/6) masses of iron accumulation throughout; many medium prominent black (10YR 2/1) masses of manganese accumulation throughout; gray (10YR 5/1) organo-clay filled krotovina along seams; neutral; clear wavy boundary.

Btg4=42 to 50 inches; grayish brown (2.5Y 5/2) silty clay loam; weak medium prismatic structure parting to moderate medium subangular blocky; firm; few fine roots; common distinct gray (10YR 5/1) clay films on faces of peds; many fine and medium prominent yellowish brown (10YR 5/6) and few medium prominent strong brown (7.5YR 5/6) masses of iron accumulation throughout; common medium prominent black (10YR 2/1) masses of manganese accumulation throughout; gray (10YR 5/1) organo-clay filled krotovina along seams; neutral; clear wavy boundary.

2BC=50 to 61 inches; yellowish brown (10YR 5/6) loam; weak fine and medium subangular blocky structure; firm; few fine roots along faces of peds; common medium prominent grayish brown (10YR 5/2) iron depletions throughout; few medium faint yellowish brown (10YR 5/6) masses of iron accumulation throughout; few fine prominent black (10YR 2/1) masses of manganese accumulation throughout; gray (10YR 5/1) organo-clay filled krotovina along seams; 5 percent rock fragments; slightly effervescent; slightly alkaline; clear broken boundary.

2C=61 to 80 inches; yellowish brown (10YR 5/6) loam; massive; friable; few fine prominent grayish

brown (10YR 5/2) iron depletions throughout; few medium distinct yellowish brown (10YR 5/8) masses of iron accumulation throughout; gray (10YR 5/1) organo-clay filled krotovina along seams; 10 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics
Thickness of the solum: 58 to 75 inches
Thickness of the mollic epipedon: 10 to 12 inches
Depth to carbonates: 43 to 60 inches
Thickness of the loess mantle: 40 to 60 inches
Content of rock fragments: Ap and Btg horizons=0 percent; 2Bt horizon=1 percent; 2BC horizon=2 to 5 percent; 2C horizon=5 to 10 percent

Ap horizon:
Color=hue of 10YR, value of 3, chroma of 1 or 2
Texture=silt loam

Btg or Bt horizon:
Color=hue of 10YR or 2.5Y, value of 4 or 5, chroma of 1 to 4
Texture=silty clay loam

2Bt horizon where present:
Color=hue of 10YR, value of 4 or 5, chroma of 2 to 4
Texture=clay loam

2BC horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 3 to 6
Texture=clay loam or loam

2C horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 4 to 6
Texture=loam

Dana Series

Depth class: Very deep
Drainage class: Moderately well drained
Parent material: Loess and the underlying till
Landform: Flats and slight rises on the Wisconsinan till plains
Position on the landform: Summits
Slope: 0 to 6 percent
Adjacent soils: Cyclone, Fincastle, Russell, Wynn, and Xenia

Taxonomic Class: Fine-silty, mixed, superactive, mesic Oxyaquic Argiudolls

Typical Pedon
Dana silt loam, 2 to 6 percent slopes, about 1 mile southeast of Morning Sun, in Israel Township, Preble County, Ohio; about 1,800 feet west and 135 feet north of the southeast corner of sec. 26, T. 6 N., R. 1 E.

Ap1=0 to 5 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine and medium subangular blocky structure; friable; common very fine to medium roots; slightly acid; clear smooth boundary.

Ap2=5 to 10 inches; very dark gray (10YR 3/1) silt loam, grayish brown (10YR 5/2) dry; moderate medium and coarse subangular blocky structure; friable; common very fine and fine roots; neutral; abrupt smooth boundary.

Bt1=10 to 15 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine prismatic structure parting to strong medium and coarse subangular blocky; firm; common very fine and fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; common fine distinct black (10YR 2/1) masses of manganese accumulation in the matrix; neutral; clear smooth boundary.

Bt2=15 to 25 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium and coarse subangular blocky structure; firm; few very fine and fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; few distinct very dark gray (10YR 3/1) organic coatings along root channels; few faint brown (10YR 5/3) clay depletions on faces of peds; few fine prominent reddish yellow (7.5YR 6/8) masses of iron accumulation in the matrix; common fine distinct black (10YR 2/1) masses of manganese accumulation in the matrix; neutral; clear wavy boundary.

Bt3=25 to 37 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine and medium subangular blocky structure; firm; few very fine and fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; few distinct very dark gray (10YR 3/1) organic coatings along root channels; few fine faint grayish brown (10YR 5/2) iron depletions in the matrix; common fine distinct yellowish brown (10YR 5/6) and few fine prominent brownish yellow (10YR 6/8) masses of iron accumulation in the matrix; common fine distinct black (10YR 2/1) masses of manganese accumulation in the matrix; neutral; clear wavy boundary.

2BC=37 to 48 inches; dark yellowish brown (10YR 4/4) clay loam; weak fine and medium subangular blocky structure; friable; few very fine and fine roots; few distinct brown (10YR 4/3) clay films along root channels; few distinct very dark gray (10YR 3/1) organic coatings along root channels; few fine

distinct grayish brown (10YR 5/2) iron depletions in the matrix; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine and medium prominent yellowish red (5YR 4/6) iron nodules in the matrix; common fine distinct black (10YR 2/1) masses of manganese accumulation in the matrix; common fine and medium prominent white (10YR 8/1) masses of calcium carbonate accumulation in the matrix; 4 percent limestone and 3 percent shale fragments; strongly effervescent; moderately alkaline; gradual wavy boundary.

2C=48 to 65 inches; brown (10YR 5/3) loam with pockets of yellowish brown (10YR 5/4) silt loam; massive; friable; common fine faint grayish brown (10YR 5/2) iron depletions in the matrix; common fine prominent reddish yellow (7.5YR 6/8) masses of iron accumulation in the matrix; common fine distinct black (10YR 2/1) masses of manganese accumulation in the matrix; common fine and medium distinct white (10YR 8/1) masses of calcium carbonate accumulation in the matrix; 3 percent limestone fragments, 2 percent igneous fragments, and 2 percent shale fragments; strongly effervescent; moderately alkaline; gradual wavy boundary.

2Cd=65 to 80 inches; brown (10YR 5/3) loam; massive; firm; few fine and medium prominent reddish yellow (7.5YR 6/8) masses of iron accumulation in the matrix; few fine distinct black (10YR 2/1) masses of manganese accumulation in the matrix; 2 percent limestone fragments, 2 percent igneous fragments, and 2 percent shale fragments; strongly effervescent; moderately alkaline.

Range in Characteristics
Thickness of the solum: 40 to 60 inches
Thickness of the mollic epipedon: 10 to 15 inches
Thickness of the loess mantle: 22 to 40 inches
Depth to carbonates: 30 to 60 inches
Content of rock fragments: Ap and Bt horizons=0 percent; 2BC horizon=2 to 8 percent; 2C and 2Cd horizons=5 to 10 percent

Ap horizon:
Color=hue of 10YR, value of 3, chroma of 1 or 2
Texture=silt loam

Bt horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 3 or 4
Texture=silty clay loam

2BC horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 3 or 4
Texture=clay loam or loam

2C and 2Cd horizons:
Color=hue of 10YR or 2.5Y, value of 4 or 5, chroma of 3 to 6
Texture=loam; some pedons have pockets of silt loam in the upper part

Eel Series

Depth class: Very deep
Drainage class: Moderately well drained
Parent material: Recent alluvium
Landform: Flood plains
Slope: 0 to 1 percent
Adjacent soils: Medway and Sloan

Taxonomic class: Fine-loamy, mixed, superactive, mesic Fluvaquentic Eutrudepts

Typical Pedon
Eel silt loam, gravelly substratum, 0 to 1 percent slopes, occasionally flooded, located about 1/2 mile north of College Corner, in Israel Township, Preble County, Ohio; about 2,300 feet south and 435 feet east of the northwest corner of sec. 29, T. 6 N., R. 1 E.

Ap=0 to 13 inches; brown (10YR 4/3) silt loam, pale brown (l0YR 6/3) dry; weak medium and coarse granular structure parting to weak fine subangular blocky; friable; common fine and medium roots; many distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; 1 percent rock fragments; neutral; clear smooth boundary.

Bw1=13 to 18 inches; yellowish brown (10YR 5/4) silt loam; weak medium subangular blocky structure; friable; few fine and medium roots; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few medium prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; 1 percent rock fragments; neutral; clear wavy boundary.

Bw2=18 to 23 inches; yellowish brown (10YR 5/4) loam; weak medium subangular blocky structure; friable; few fine roots; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; few medium prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; common fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 1 percent rock fragments; neutral; clear wavy boundary.

Bw3=23 to 31 inches; yellowish brown (10YR 5/4) loam; weak medium and coarse subangular blocky structure; friable; few medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; few medium prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; common fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 1 percent rock fragments; neutral; clear wavy boundary.

Bw4=31 to 37 inches; yellowish brown (10YR 5/4) loam; weak medium subangular blocky structure; friable; few medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; few medium prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; common fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 1 percent rock fragments; neutral; clear wavy boundary.

BCg=37 to 48 inches; grayish brown (10YR 5/2) loam with thin strata of very fine sandy loam; weak fine and medium subangular blocky structure; friable; common medium faint grayish brown (10YR 5/2) iron depletions in the matrix; few medium prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; common fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 5 percent rock fragments; slightly effervescent; slightly alkaline; abrupt wavy boundary.

2C=48 to 80 inches; yellowish brown (10YR 5/4) gravelly sandy loam; massive; friable; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; few medium prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 20 percent rock fragments; slightly effervescent; slightly alkaline.

Range in Characteristics:
Thickness of the cambic horizon: 20 to 40 inches
Depth to carbonates: 20 to 40 inches
Content of rock fragments: Ap horizon=0 to 2 percent; Bw horizon=0 to 5 percent; BCg horizon=0 to 7 percent; 2C horizon=15 to 25 percent

Ap horizon:
Color=hue of l0YR, value of 4 or 5, chroma of 2 or 3
Texture=silt loam

Bw or Bg horizon:
Color=hue of l0YR, value of 4 or 5, chroma of 1 to 6
Texture=silt loam, clay loam, or loam

BC or BCg horizon:
Color=hue of l0YR, value of 4 to 6, chroma of 1 to 6
Texture=silt loam, loam, fine sandy loam, or sandy loam, with thin strata of very fine sandy loam, clay loam, or silty clay loam in some pedons

2C or 2Cg horizon:
Color=hue of l0YR, value of 4 to 6, and chroma of l to 4
Texture=gravelly analogues of loam, fine sandy loam, or sandy loam, and includes strata of silt loam, silty clay loam, clay loam, loamy sand, or sand in some pedons

Eldean Series

Depth class: Very deep
Drainage class: Well drained
Parent material: Outwash
Landform: Wisconsinan outwash terraces and kames
Position on the landform: Treads, risers, shoulders, and backslopes
Slope: 0 to 18 percent
Adjacent soils: Lippincott, Savona, Ockley, Westland, and Kendallville

Taxonomic class: Fine, mixed, superactive, mesic Typic Hapludalfs

Typical Pedon
Eldean loam, 0 to 2 percent slopes, located 5.3 miles north of New Paris, in Jefferson Township, Preble County, Ohio; about 2,290 feet east and 265 feet south of the northwest corner of sec. 4, T. 9 N., R. 1 E.

Ap=0 to 9 inches; dark grayish brown (10YR 4/2) loam; weak fine and medium subangular structure; friable; common fine roots; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; 5 percent gravel; neutral; abrupt smooth boundary.

BA=9 to 14 inches; brown (7.5YR 4/3) loam; weak medium subangular blocky structure; friable; few fine roots; few distinct very dark gray (10YR 3/1) organic coatings on faces of peds; 2 percent gravel; neutral; abrupt wavy boundary.

Bt1=14 to 20 inches; brown (7.5YR 4/4) clay loam; moderate medium subangular blocky structure; firm; few fine roots; many faint brown (7.5YR 4/3) clay films on faces of peds; 5 percent gravel; neutral; clear wavy boundary.

Bt2=20 to 28 inches; brown (7.5YR 4/4) gravelly clay; strong medium and coarse subangular blocky structure; firm; many faint brown (7.5YR 4/4) clay films on faces of peds; 15 percent gravel; neutral; gradual wavy boundary.

BC1=28 to 32 inches; dark reddish brown (5YR 3/2) gravelly clay loam; strong medium and coarse subangular blocky structure; firm; many faint dark brown (7.5YR 3/2) clay films on faces of peds; 15 percent gravel; neutral; gradual wavy boundary.

BC2=32 to 36 inches; very dark grayish brown (10YR 3/2) very gravelly coarse sandy loam; weak coarse subangular blocky structure; firm; few distinct dark brown (10YR 3/3) clay films on faces of peds; common medium prominent light gray (10YR 7/2) masses of calcium carbonate accumulation throughout; 35 percent gravel; slightly effervescent; slightly alkaline; clear wavy boundary.

C1=36 to 41 inches; brown (10YR 4/3) very gravelly loamy sand; single grain; loose; 40 percent gravel; strongly effervescent; moderately alkaline; gradual wavy boundary.

C2=41 to 46 inches; dark yellowish brown (10YR 4/6) loamy sand; single grain; loose; 10 percent gravel; strongly effervescent; moderately alkaline; clear wavy boundary.

C3=46 to 80 inches; dark yellowish brown (10YR 4/4) extremely gravelly loamy coarse sand; single grain; loose; 70 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics
Thickness of the solum: 20 to 40 inches
Depth to carbonates: 18 to 36 inches
Content of rock fragments: Ap and upper Bt horizons=0 to 30 percent; lower Bt and BC horizons=10 to 59 percent; C horizon=0 to 70 percent, but averages more than 30 percent

Ap horizon:
Color=hue of 7.5YR or 10YR, value of 3 to 5, chroma of 2 to 4
Texture=silt loam, loam, or gravelly loam; severely eroded pedons are gravelly clay loam

BA horizon where present:
Color=hue of 7.5YR or 10YR, value of 4 or 5, chroma of 3 or 4
Texture=silt loam, loam, clay loam, or silty clay loam, or their gravelly analogues

Bt horizon:
Color=hue of 5YR to 10YR, value of 3 to 6, chroma of 3 to 6
Texture=clay or clay loam, or their gravelly or very gravelly analogues in the lower part

BC horizon:
Color=hue of 5YR to 10YR, value of 3 to 6, chroma of 2 to 4
Texture=coarse sandy loam, sandy loam, loam, clay loam, or sandy clay loam, or their gravelly or very gravelly analogues; in some pedons, tongues of the Bt and/or BC horizon might extend into the C horizon 2 to 3 feet

C horizon:
Color=hue of 10YR, value of 4 to 6, chroma of 2 to 6
Texture=stratified gravelly to extremely gravelly analogues of coarse sandy loam, loamy sand, or loamy coarse sand, with strata of sand or loamy sand in some pedons

Fincastle Series

Depth class: Very Deep
Drainage class: Somewhat poorly drained
Parent material: Loess and the underlying till; in the bedrock substratum phase, loess and the underlying till over limestone and shale
Landform: Flats on the Wisconsinan till plains and ground moraines
Positions on the landform: Summits
Slope: 0 to 2 percent
Adjacent soils: Cyclone, Xenia, Morningsun, Sugarvalley, and Russell

Taxonomic class: Fine-silty, mixed, superactive, mesic Aeric Epiaqualfs

Typical Pedon
Fincastle silt loam, 0 to 2 percent slopes, about 1.8 miles northwest of Morning Sun, in Israel Township, Preble County, Ohio; about 380 feet west and 93 feet north of the center of SE 1/4 of the NW 1/4 of sec. 21, T. 6 N., R. 1 E.

Ap=0 to 9 inches; dark grayish brown (10YR 4/2) silt loam, pale brown (10YR 6/3) dry; weak fine subangular blocky structure; friable; many fine roots; common medium prominent strong brown (7.5YR 5/6) masses of iron accumulation throughout; common fine and medium faint black (10YR 2/1) masses of manganese accumulation throughout; neutral; abrupt smooth boundary.

Btg=9 to 13 inches; grayish brown (10YR 5/2) silty clay loam; moderate medium subangular blocky

structure; friable; common fine roots; many distinct grayish brown (10YR 5/2) clay films on faces of peds; many medium prominent strong brown (7.5YR 5/8) masses of iron accumulation throughout; common fine and medium distinct black (10YR 2/1) masses of manganese accumulation throughout; common fine and medium distinct black (10YR 2/1) iron and manganese concretions throughout; moderately acid; clear smooth boundary.

Bt1=13 to 27 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; firm; common fine roots; many distinct grayish brown (10YR 5/2) clay films on faces of peds; common fine and medium distinct light brownish gray (10YR 6/2) iron depletions in the matrix; common medium prominent strong brown (7.5YR 5/8) masses of iron accumulation throughout; common fine and medium distinct black (10YR 2/1) masses of manganese accumulation throughout; slightly acid; clear smooth boundary.

Bt2=27 to 35 inches; yellowish brown (10YR 5/4) silt loam; moderate medium subangular blocky structure; firm; few fine roots; many distinct grayish brown (10YR 5/2) clay films on faces of peds; common fine and medium distinct light brownish gray (10YR 6/2) iron depletions in the matrix; common medium prominent strong brown (7.5YR 5/8) masses of iron accumulation throughout; common fine and medium distinct black (10YR 2/1) masses of manganese accumulation throughout; slightly acid; clear smooth boundary.

2Bt3=35 to 38 inches; yellowish brown (10YR 5/4) clay loam; moderate fine and medium subangular blocky structure; firm; common distinct grayish brown (10YR 5/2) clay films on faces of peds; common medium distinct light brownish gray (10YR 6/2) iron depletions in the matrix; common medium prominent strong brown (7.5YR 5/8) masses of iron accumulation throughout; 5 percent subrounded granite fragments; neutral; clear wavy boundary.

2BC=38 to 46 inches; brown (10YR 5/3) clay loam; weak coarse subangular blocky structure; firm; common faint grayish brown (10YR 5/2) clay films on vertical faces of peds; common medium faint light brownish gray (10YR 6/2) iron depletions in the matrix; common medium prominent strong brown (7.5YR 5/8) masses of iron accumulation throughout; 5 percent subrounded granite fragments and 5 percent subrounded limestone fragments; slightly effervescent; slightly alkaline; clear smooth boundary.

2Cd=46 to 80 inches; brown (10YR 5/3) loam; massive; very firm; common medium faint light brownish gray (10YR 6/2) iron depletions in the matrix; common medium prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; 5 percent subrounded granite fragments and 5 percent subrounded limestone fragments; strongly effervescent; moderately alkaline.

Range in Characteristics:
Thickness of the solum: 40 to 60 inches
Depth to carbonates: 35 to 60 inches
Depth to bedrock: greater than 80 inches; in the bedrock substratum phase, it is 60 to 80 inches
Thickness of the loess mantle: 22 to 40 inches
Content of rock fragments: Ap and Bt horizons=0 to 1 percent;
2Bt horizon=1 to 7 percent; 2BC horizon=1 to 10 percent; 2Cd horizon=2 to 14 percent

Ap horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 2 or 3
Texture=silt loam

Bt or Btg horizon:
Color=hue of 10YR, value of 4 to 6, chroma of 2 to 6
Texture=silt loam or silty clay loam

2Bt or 2Btg horizon:
Color=hue of 10YR, value of 4 to 6, chroma of 2 to 6
Texture=clay loam, silty clay loam, or loam

2BC or 2BCg horizon:
Color=hue of 10YR, value of 4 to 6, chroma of 2 to 6
Texture=clay loam or loam

2Cd horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 2 to 4
Texture=loam; in the bedrock substratum phase, the range is loam or flaggy loam

3Cr horizon (in the bedrock substratum phase):
weathered shale and limestone bedrock

Fox Series

Depth class: Very deep
Drainage class: Well drained
Parent material: Loamy material over gravelly and very gravelly
sandy outwash over till
Landform: Wisconsinan outwash terraces
Position on the landform: Treads
Slope: 0 to 6 percent
Adjacent soils: Ockley

Taxonomic class: Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Typic Hapludalfs

Typical Pedon
Fox silt loam, till substratum, 0 to 2 percent slopes, about 1.75 miles north of West Alexandria, in Twin Township, Preble County, Ohio; 1,900 feet east and 1,060 feet south of the northwest corner of sec. 27, T. 6 N., R. 3 E.

Ap1=0 to 6 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine granular structure; friable; many fine and medium roots; 1 percent gravel; neutral; clear smooth boundary.

Ap2=6 to 10 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine and medium subangular blocky structure; friable; many fine and medium roots; 1 percent gravel; slightly acid; abrupt smooth boundary.

Bt1=10 to 15 inches; yellowish brown (10YR 5/4) loam; weak fine and medium subangular blocky structure; friable; common fine and medium roots; few distinct brown (10YR 4/3) clay films on faces of peds; few faint brown (10YR 5/3) clay depletions on faces of peds; 1 percent gravel; neutral; clear smooth boundary.

Bt2=15 to 20 inches; brown (7.5YR 5/4) clay loam; moderate medium subangular blocky structure; firm; common fine roots; common distinct brown (7.5YR 4/3) clay films on faces of peds; 8 percent gravel; neutral; clear smooth boundary.

Bt3=20 to 26 inches; brown (7.5YR 4/4) clay loam; moderate medium and coarse subangular blocky structure; firm; common fine roots; many distinct brown (7.5YR 4/3) clay films on faces of peds; 9 percent gravel; neutral; clear smooth boundary.

Bt4=26 to 31 inches; brown (7.5YR 4/3) clay loam; moderate fine prismatic structure parting to moderate medium and coarse subangular blocky; firm; common fine roots; many distinct dark brown (7.5YR 3/3) clay films on faces of peds; few fine prominent brownish yellow (10YR 6/8) masses of iron accumulation throughout; 12 percent gravel; neutral; clear wavy boundary.

Bt5=31 to 37 inches; brown (10YR 4/3) gravelly sandy clay loam; weak fine and medium subangular blocky structure; firm; common fine roots; common distinct dark brown (10YR 3/3) clay films on faces of peds; many fine and medium prominent white (10YR 8/1) masses of calcium carbonate accumulation throughout; 20 percent gravel; neutral; gradual wavy boundary.

C1=37 to 46 inches; yellowish brown (10YR 5/4) very gravelly loamy sand; single grain; loose; few fine roots; 45 percent gravel; slightly effervescent; slightly alkaline; gradual wavy boundary.

C2=46 to 64 inches; brown (10YR 5/3) extremely gravelly loamy sand; single grain; loose; 65 percent gravel; slightly effervescent; slightly alkaline; clear wavy boundary.

2C=64 to 80 inches; brown (10YR 5/3) loam; massive; friable; 5 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics
Thickness of the solum: 25 to 40 inches
Depth to carbonates: 20 to 40 inches
Depth to till: 60 to 80 inches
Content of rock fragments: Ap horizon=1 to 4 percent; Bt horizon=1 to 20 percent; C horizon=15 to 65 percent; 2C horizon=2 to 10 percent

Ap horizon:
Color=hue of 10YR, value of 3 or 4, chroma of 2 or 3
Texture=silt loam

Bt horizon:
Color=hue of 7.5YR or 10YR, value of 4 or 5, chroma of 3 or 4
Texture=clay loam, loam, gravelly clay loam, or gravelly sandy
clay loam

BC horizon where present:
Color=hue of 7.5YR or 10YR, value of 3 to 5, chroma of 3 or 4
Texture=gravelly loam or very gravelly sandy loam

C horizon:
Color=hue of 10YR, value of 5, chroma of 3 or 4
Texture=gravelly loamy sand, very gravelly loamy sand,
extremely gravelly loamy sand, or very gravelly sand

2C horizon:
Color=hue of 10YR, value of 5, chroma of 3
Texture=loam

The Fox soils in the FmB2 map unit are a taxajunct to the Fox series because they lack a strongly contrasting particle-size class which is defined for the series. They classify as fine-loamy, mixed, superactive, mesic Typic Hapludalfs. This difference, however, does not significantly affect use and management of the soils.

Hennepin Series

Depth class: Very deep
Drainage class: Well drained
Parent material: Basal till
Landform: Wisconsinan till plains
Position on the landform: Backslopes
Slope: 18 to 50 percent
Adjacent soils: Miamian and Wynn

Taxonomic class: Fine-loamy, mixed, active, mesic Typic Eutrudepts

Typical Pedon
Hennepin silt loam, from an area of Hennepin-Miamian silt loams, 25 to 50 percent slopes, eroded, about 2.25 miles northeast of College Corner, in Israel Township, Preble County, Ohio; about 1,150 feet east and 1,975 feet south of the northwest corner of sec. 28, T. 6 N., R. 1 E.

A=0 to 4 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; moderate fine and medium subangular blocky structure; friable; many fine, common medium, and few coarse roots; many distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; 2 percent rock fragments; slightly effervescent; slightly alkaline; clear wavy boundary.

Bw=4 to 16 inches; dark yellowish brown (10YR 4/4) clay loam; moderate medium and coarse subangular blocky structure; firm; common fine and medium roots; common distinct brown (10YR 4/3) clay films on faces of peds; few distinct very dark grayish brown (10YR 3/2) organic coatings on vertical faces of peds; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 5 percent rock fragments; slightly effervescent; slightly alkaline; gradual wavy boundary.

Cd=16 to 80 inches; brown (10YR 5/3) loam; massive; very firm; few fine roots along vertical faces of fractures in the upper part; common distinct yellowish brown (10YR 5/6) masses of iron accumulation throughout; common fine distinct black (10YR 2/1) masses of manganese accumulation along vertical fractures; 10 percent rock fragments; violently effervescent; moderately alkaline.

Range in Characteristics
Thickness of the solum: 10 to 20 inches
Depth to carbonates: commonly throughout the profile
Content of rock fragments: A horizon=2 to 5 percent; Bw horizon=2 to 10 percent; Cd horizon=5 to 12 percent

A horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 3 or 4
Texture=silt loam or clay loam

Bw horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 4
Texture=loam or clay loam

Cd horizon:
Color=hue of 10YR, value of 5, chroma of 3 or 4
Texture=loam

The Hennepin soils in Preble County are a taxadjunct to the Hennepin series because they have a dense till substratum (Cd horizon) which is not defined for the series. They classify as loamy, mixed, active, mesic, shallow Typic Eutrudepts. This difference, however, does not significantly affect use and management of the soil.

Kendallville Series

Depth class: Very deep
Drainage class: Well drained
Parent material: A thin layer of loess and the underlying outwash and till
Landform: Kames, moraines, and outwash terraces
Position on the landform: Shoulders, footslopes, backslopes, and risers
Slope: 6 to 50 percent
Adjacent soils: Miamian and Rainsville

Taxonomic class: Fine-loamy, mixed, superactive, mesic Typic Hapludalfs

Typical Pedon
Kendallville silt loam, from an area of Miamian-Kendallville silt loams, 18 to 25 percent slopes, eroded, about 2 miles northeast of New Paris, in Jefferson Township, Preble County, Ohio; about 1,484 feet south and 1,286 feet east of the northwest corner of sec. 16, T. 9 N., R. 1 E.

Ap=0 to 4 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine subangular blocky structure; friable; many fine roots; many distinct very dark grayish brown (10YR 3/2) organic coatings throughout; 2 percent gravel; neutral; clear smooth boundary.

Bt1=4 to 9 inches; brown (7.5YR 4/4) clay loam; moderate medium subangular blocky structure; friable; common fine roots; common distinct brown (7.5YR 4/4) clay films on faces of peds; common prominent very dark grayish brown (10YR 3/2) organic coatings on vertical faces of peds; 10

percent gravel; moderately acid; clear smooth boundary.

Bt2=9 to 16 inches; brown (7.5YR 5/4) clay loam; moderate medium and coarse subangular blocky structure; firm; few fine roots; common distinct brown (7.5YR 4/4) clay films on faces of peds; very few prominent very dark grayish brown (10YR 3/2) organic coatings on vertical faces of peds; 5 percent gravel; slightly acid; clear wavy boundary.

Bt3=16 to 21 inches; yellowish brown (10YR 5/4) clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; 3 percent gravel; neutral; clear wavy boundary.

Bt4=21 to 29 inches; brown (7.5YR 4/4) gravelly clay loam; weak coarse subangular blocky structure; firm; common distinct dark brown (10YR 3/3) clay films on vertical faces of peds; common prominent light gray (10YR 7/2) masses of calcium carbonate accumulation around gravel; 30 percent gravel; neutral; abrupt smooth boundary.

2Cd1=29 to 41 inches; yellowish brown (10YR 5/4) loam; massive with horizontal fractures; firm; few fine distinct strong brown (7.5YR 5/6) masses of iron accumulation throughout; few medium distinct black (10YR 2/1) masses of manganese accumulation throughout; 10 percent subrounded and angular rock fragments; strongly effervescent; moderately alkaline; abrupt wavy boundary.

2Cd2=41 to 80 inches; yellowish brown (10YR 5/4) loam; massive; firm; few fine distinct strong brown (7.5YR 5/6) masses of iron accumulation throughout; few medium distinct black (10YR 2/1) masses of manganese accumulation throughout; common fine faint pale brown (10YR 6/3) masses of calcium carbonate accumulation along vertical fractures; 10 percent subrounded and angular rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum and depth to till: commonly 25 to 40 inches, but ranges to 55 inches in some areas
Depth to carbonates: 20 to 40 inches
Thickness of the loess mantle: 0 to 10 inches
Content of rock fragments: Ap horizon=0 to 2 percent; Bt horizon=2 to 30 percent; 2Cd horizon=5 to 14 percent

Ap horizon:
Color=hue of 10YR, value of 4, chroma of 2 or 3
Texture=silt loam or loam

Bt or 2Bt horizon:
Color=hue of 7.5YR or 10YR, value of 4 or 5, chroma of 4
Texture=silty clay loam in the upper part if a loess cap is present, clay loam or gravelly clay loam

2Cd or 3Cd horizon:
Color=hue of 10YR, value of 5, chroma of 3 or 4
Texture=loam

Kokomo Series

Depth class: Very deep
Drainage class: Very poorly drained
Parent material: Loamy materials and the underlying till
Landform: Flats and depressions on the Wisconsinan till plains
Slope: 0 to 1 percent
Adjacent soils: Celina, Crosby, and Miamian

Taxonomic class: Fine, mixed, superactive, mesic Typic Argiaquolls

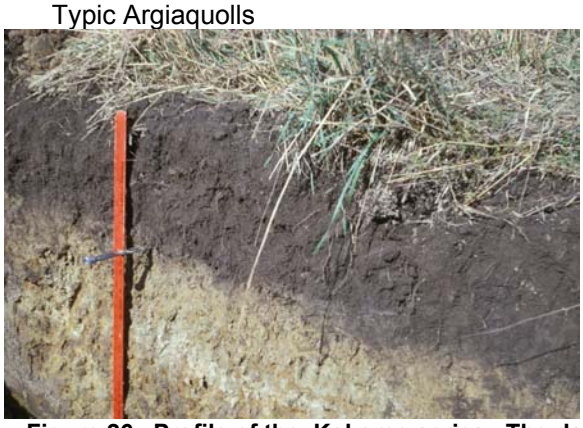


Figure 26. Profile of the Kokomo series. The dark surface horizon is 12 inches thicl.

Typical Pedon

Kokomo silty clay loam, 0 to 1 percent slopes, about 3.2 miles northeast of Eaton, in Twin Township, Preble County, Ohio; about 480 feet north and 900 feet east of the southwest corner of sec. 18, T. 6 N., R. 3 E.

Ap=0 to 8 inches; very dark grayish brown (10YR 3/2) silty clay loam, grayish brown (10YR 5/2) dry; weak medium and coarse angular blocky structure; firm; many very fine to medium roots; few fine faint black (10YR 2/1) manganese concretions throughout; 1 percent limestone and igneous fragments; strongly acid; abrupt smooth boundary.

A=8 to 11 inches; very dark grayish brown (10YR 3/2) silty clay loam, grayish brown (10YR 5/2) dry; weak medium and coarse angular blocky structure; firm; many fine and very fine roots; common faint very dark gray (10YR 3/1) organic coatings on faces of peds; 1 percent limestone and igneous fragments; strongly acid; clear smooth boundary.

Btg1=11 to 15 inches; dark gray (10YR 4/1) clay loam; weak medium prismatic structure parting to moderate medium subangular blocky; firm; common fine and very fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common medium prominent dark yellowish brown (10YR 4/6) and few medium prominent yellowish red (5YR 4/6) masses of iron accumulation throughout; 1 percent limestone and igneous fragments; slightly acid; clear wavy boundary.

Btg2=15 to 21 inches; dark grayish brown (10YR 4/2) clay loam; weak medium prismatic structure parting to moderate medium subangular blocky; firm; common fine and very fine roots; many distinct dark gray (10YR 4/1) clay films on faces of peds; few medium prominent dark yellowish brown (10YR 4/6) and common fine and medium distinct light olive brown (2.5Y 5/4) masses of iron accumulation throughout; 1 percent igneous fragments; slightly acid; gradual wavy boundary.

Btg3=21 to 27 inches; grayish brown (2.5Y 5/2) clay loam; moderate fine and medium subangular blocky structure; firm; few fine and medium roots; common distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; few medium prominent dark yellowish brown (10YR 4/6) and common fine and medium distinct and prominent light olive brown (2.5Y 5/4 and 5/6) masses of iron accumulation throughout; 1 percent igneous fragments; neutral; gradual wavy boundary.

Btg4=27 to 33 inches; grayish brown (2.5Y 5/2) clay loam; moderate medium subangular blocky structure; firm; few fine and medium roots; few distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; common medium and coarse prominent dark yellowish brown (10YR 4/6) and common fine distinct and prominent light olive brown (2.5Y 5/4 and 5/6) masses of iron accumulation throughout; few fine prominent black (10YR 2/1) masses of manganese accumulation in the matrix; 1 percent igneous fragments; neutral; gradual wavy boundary.

Btg5=33 to 41 inches; grayish brown (2.5Y 5/2) silty clay loam; moderate fine and medium subangular blocky structure; firm; few fine and very fine roots; few distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; common coarse prominent dark yellowish brown (10YR 4/6) and common medium prominent light olive brown (2.5Y 5/6) masses of iron accumulation throughout; few fine prominent black (10YR 2/1) masses of manganese accumulation in the matrix; 2 percent igneous fragments; neutral; gradual wavy boundary.

Bt=41 to 48 inches; light olive brown (2.5Y 5/3) clay loam; moderate fine and medium subangular blocky structure; firm; few distinct dark grayish brown (10YR 4/2) clay films on faces of peds; many medium and coarse faint grayish brown (10YR 5/2) iron depletions in the matrix; many medium and coarse prominent dark yellowish brown (10YR 4/6) and common medium prominent yellowish brown (10YR 5/8) masses of iron accumulation throughout; 1 percent igneous fragments; slightly alkaline; gradual wavy boundary.

2BC=48 to 64 inches; yellowish brown (10YR 5/4) clay loam; weak fine and medium subangular blocky structure; firm; few distinct dark grayish brown (10YR 4/2) clay films along root channels; many medium and coarse distinct grayish brown (10YR 5/2) iron depletions in the matrix; common medium and coarse distinct dark yellowish brown (10YR 4/6) and common medium prominent yellowish brown (10YR 5/8) masses of iron accumulation throughout; 7 percent igneous, limestone, and shale fragments; slightly effervescent; slightly alkaline; gradual wavy boundary.

2C=64 to 80 inches; dark yellowish brown (10YR 4/4) loam; massive; firm; few coarse prominent brownish yellow (10YR 6/8) masses of iron accumulation along vertical fractures; common medium distinct gray (10YR 6/1) masses of secondary carbonates along faces of fractures; 8 percent igneous, limestone, and shale fragments; strongly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the solum: 50 to 70 inches
Thickness of the mollic epipedon: 10 to 15 inches
Depth to carbonates: 36 to 60 inches
Content of rock fragments: Ap and Btg horizons=0 to 5 percent; 2Bt, 2BC and 2C horizons=1 to 10 percent

Ap or A horizon:
Color=hue of 10YR, value of 2 or 3, chroma of 1 or 2
Texture=silty clay loam or silt loam

Btg horizon:
Color=hue of 10YR or 2.5Y, value of 4 or 5, chroma of 1 or 2
Texture=silty clay loam, silty clay, or clay loam

Bt horizon:
Color=hue of 10YR or 2.5Y, value of 4 or 5, chroma of 3 or 4
Texture=silty clay loam, silty clay, or clay loam

2BC horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 3 or 4
Texture=clay loam or loam

2C horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 3 or 4
Texture=loam

Lewisburg Series

Depth class: Very deep
Drainage class: Moderately well drained
Parent material: Basal till
Landform: Flats and slight rises on the Wisconsinan till plains
Position on the landform: Summits and shoulders
Slope: 0 to 12 percent
Adjacent soils: Celina, Crosby, Kokomo, Losantville, and Miamian

Taxonomic Class: Clayey, mixed, active, mesic, shallow Aquic Hapludalfs

Typical Pedon
Lewisburg silt loam, 2 to 6 percent slopes, about 3.5 miles south of New Madison, in Butler Township, Darke County, Ohio; 60 feet north and 2,640 feet west of the southeast corner of sec. 31, T. 10 N., R. 2 E.

Ap=0 to 9 inches; dark grayish brown (10YR 4/2) silt loam, light gray (10YR 7/2) dry; weak fine and medium subangular blocky structure parting to moderate medium granular; friable; few fine roots; 2 percent rock fragments; neutral; clear smooth boundary.

Bt=9 to 14 inches; dark yellowish brown (10YR 4/4) clay loam; moderate medium subangular blocky structure; firm; few fine roots; common faint brown (10YR 4/3) clay films on faces of peds; few fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; few fine faint dark yellowish brown (10YR 4/4) masses of iron and manganese accumulation in the matrix; 5 percent rock fragments; slightly alkaline; clear wavy boundary.

BC=14 to 19 inches; dark yellowish brown (10YR 4/6) loam; weak medium subangular blocky structure; firm; few fine roots; few faint dark grayish brown (10YR 4/2) clay films on vertical faces of peds; common fine prominent grayish brown (10YR 5/2) iron depletions in the matrix; few fine prominent black (10YR 2/1) manganese concretions throughout; 12 percent rock fragments; slightly effervescent; moderately alkaline; clear wavy boundary.

Cd1=19 to 30 inches; yellowish brown (10YR 5/4) loam; massive; firm; common fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine distinct very dark gray (10YR 3/1) iron and manganese concretions throughout; common distinct light gray (10YR 7/2) calcium carbonate coatings on vertical fracture faces; 12 percent rock fragments; strongly effervescent; moderately alkaline; gradual wavy boundary.

Cd2=30 to 80 inches; yellowish brown (10YR 5/4) loam; massive; very firm; common fine distinct grayish brown (10YR 5/2) iron depletions along fracture faces; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation along fracture faces; few distinct light gray (10YR 7/2) calcium carbonate coatings on vertical fracture faces 4 inches apart; 12 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics
Thickness of the solum: 10 to 20 inches
Depth to carbonates: 8 to 16 inches
Content of rock fragments: Ap horizon=0 to 10 percent; Bt and BC horizon=2 to 12 percent; Cd horizon=2 to 14 percent; rock fragments are of mixed lithology, including some crystalline rocks

Ap horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 2 to 4
Texture=silt loam or clay loam

Bt horizon:
Color=hue of 7.5YR or 10YR, value of 4 or 5, chroma of 3 to 6
Texture=clay, silty clay, clay loam, or silty clay loam

BC horizon:
Color=hue of 7.5YR or 10YR, value of 4 or 5, chroma of 3 to 6
Texture=clay loam, silty clay loam, loam, or silt loam

Cd horizon:
Color=hue of 10YR or 2.5Y, value of 4 to 6, chroma of 3 to 6
Texture=loam or silt loam

Lippincott Series

Depth class: Very deep
Drainage class: Very poorly drained
Parent material: Silty material and the underlying outwash high in limestone gravel and sand
Landform: Depressions on Wisconsinan outwash terraces
Position on the landform: Treads
Slope: 0 to 2 percent
Adjacent soils: Eldean and Savona

Taxonomic class: Fine, mixed, superactive, mesic Typic Argiaquolls

Typical Pedon
Lippincott silty clay loam, 0 to 2 percent slopes, about 5.3 miles north of New Paris, in Jefferson Township, Preble County, Ohio; about 1,410 feet east and 480 feet south of the northwest corner of sec. 4, T. 9 N., R. 1 E.

Figure 27. Profile of Lippincott series. The scale is in 6-inch increments.

Ap=0 to 11 inches; very dark grayish brown (10YR 3/2) silty clay loam, grayish brown (10YR 5/2) dry; weak fine and medium subangular blocky structure; friable; common fine roots; 2 percent gravel; neutral; abrupt smooth boundary.

Btg1=11 to 18 inches; dark gray (10YR 4/1) clay loam; moderate medium subangular blocky structure; firm; few fine roots; many faint dark gray (10YR 4/1) clay films on faces of peds; few faint very dark gray (10YR 3/1) organic coatings on faces of peds and in root channels; common fine faint grayish brown (10YR 5/2) iron depletions in the matrix; common fine prominent yellowish brown (10YR 5/6) and common fine prominent light olive brown (2.5Y 5/4) masses of iron accumulation in the matrix; few fine and medium faint black (10YR 2/1) masses of manganese accumulation throughout; 2 percent gravel; neutral; clear wavy boundary.

Btg2=18 to 25 inches; grayish brown (2.5Y 5/2) clay loam; moderate medium subangular blocky structure; firm; few fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few faint very dark gray (10YR 3/1) organic coatings on faces of peds and in root channels; few fine faint light brownish gray (2.5Y 6/2) iron depletions in the matrix; common fine prominent yellowish brown (10YR 5/6) and common fine distinct light olive brown (2.5Y 5/4) masses of iron accumulation in the matrix; few fine and medium prominent black (10YR 2/1) masses of manganese accumulation throughout; common prominent white (10YR 8/1) masses of calcium carbonate accumulation around pebbles; 10 percent gravel; slightly effervescent around weathered rock fragments; slightly alkaline; clear wavy boundary.

BCg1=25 to 30 inches; dark gray (10YR 4/1) gravelly clay loam; weak coarse subangular blocky structure; firm; few faint dark gray (10YR 4/1) clay films on faces of peds; common fine prominent strong brown (7.5YR 5/6) masses of iron accumulation throughout; few fine and medium faint black (10YR 2/1) masses of manganese accumulation throughout; common prominent white (10YR 8/1) masses of calcium carbonate accumulation throughout; 30 percent gravel; slightly effervescent; slightly alkaline; clear smooth boundary.

BCg2=30 to 36 inches; dark gray (10YR 4/1) gravelly coarse sandy loam; weak coarse subangular blocky structure; firm; few faint dark gray (10YR 4/1) clay films on faces of peds; common fine prominent strong brown (7.5YR 5/6) masses of iron accumulation throughout; few fine and medium faint black (10YR 2/1) masses of manganese accumulation throughout; common prominent white (10YR 8/1) masses of calcium carbonate accumulation throughout; 30 percent gravel; slightly

effervescent; slightly alkaline; clear smooth boundary.

2Cg=36 to 80 inches; gray (10YR 5/1) extremely gravelly loamy coarse sand; single grain; loose; 65 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics
Thickness of the solum: 25 to 40 inches
Thickness of the mollic epipedon: 10 to 20 inches
Depth to carbonates: 25 to 60 inches
Content of rock fragments: Ap horizon=0 to 10 percent; Btg horizon=0 to 14 percent; BCg horizon=15 to 59 percent; 2Cg horizon=35 to 70 percent

Ap horizon:
Color=hue of 10YR or is neutral, value of 2, 2.5 or 3, chroma of 0 to 2
Texture=silty clay loam

Btg horizon:
Color=hue of 10YR to 5Y, or is neutral, value of 4 or 5, chroma of 0 to 2
Texture=clay loam, silty clay loam, silty clay, or clay

BCg horizon:
Color=hue of 10YR or 2.5Y, or is neutral, value of 4 to 6, chroma of 0 to 2
Texture=gravelly or very gravelly analogues of clay loam, loam, silt loam, sandy loam, or coarse sandy loam

2Cg horizon:
Color=hue of 10YR to 5Y, or is neutral, value of 4 to 6, chroma of 0 to 2
Texture=very gravelly or extremely gravelly analogues of coarse sandy loam, sandy loam, loam, sand, loamy sand, or loamy coarse sand, and commonly is stratified

Losantville Series

Depth class: Very deep
Drainage class: Moderately well drained
Parent material: Basal till
Landform: Wisconsinan till plains
Position on the landform: Backslopes and shoulders
Slope: 6 to 18 percent
Adjacent soils: Hennepin and Miamian

Taxonomic class: Clayey, mixed, active, mesic, shallow Oxyaquic Hapludalfs

Typical Pedon

Losantville clay loam, from an area of Miamian-Losantville clay loams, 6 to 12 percent slopes, severely eroded, about 1.25 miles east of New Paris, in Jefferson Township, Preble County, Ohio; about 1,300 feet west and 1,130 feet south of the northeast corner of sec. 28, T. 9 N., R. 1 E.

Ap=0 to 3 inches; brown (10YR 4/3) clay loam, pale brown (10YR 6/3) dry; weak fine subangular blocky structure; firm; common fine roots; 2 percent rock fragments; neutral; abrupt smooth boundary.

Bt1=3 to 7 inches; dark yellowish brown (10YR 4/4) clay loam; moderate fine and medium subangular blocky structure; firm; common fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; few fine prominent yellowish red (5YR 5/6) masses of iron accumulation throughout; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 4 percent rock fragments; neutral; clear smooth boundary.

Bt2=7 to 14 inches; yellowish brown (10YR 5/4) clay loam; moderate medium subangular blocky structure; firm; common fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; few fine prominent yellowish red (5YR 5/6) masses of iron accumulation throughout; common fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 5 percent rock fragments; neutral; clear smooth boundary.

BC=14 to 19 inches; yellowish brown (10YR 5/4) clay loam; massive parting to weak fine and medium subangular blocky; firm; common fine roots; common distinct dark brown (10YR 3/3) clay films on faces of peds; few fine prominent yellowish red (5YR 5/6) masses of iron accumulation throughout; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 10 percent rock fragments; slightly effervescent; moderately alkaline; gradual wavy boundary.

Cd1=19 to 29 inches; brown (10YR 5/3) loam; massive; firm; few fine roots; few fine prominent yellowish red (5YR 5/6) masses of iron accumulation throughout; 2 percent rock fragments; strongly effervescent; moderately alkaline; gradual wavy boundary.

Cd2=29 to 80 inches; brown (10YR 5/3) loam; massive; very firm; common fine faint light brownish gray (10YR 6/2) iron depletions along vertical fractures; few fine prominent yellowish red (5YR 5/6) masses of iron accumulation along vertical fractures; few fine prominent strong brown (7.5YR 5/6) masses of iron accumulation throughout; 8 percent rock

fragments; strongly effervescent; moderately alkaline.

Range in Characteristics
Thickness of the solum: 12 to 20 inches
Depth to carbonates: 11 to 15 inches
Depth to dense till: 12 to 20 inches
Content of rock fragments: Ap horizon=0 to 3 percent; Bt horizon=1 to 10 percent; BC horizon=3 to 10 percent; Cd horizon=5 to 10 percent

Ap horizon:
Color=hue of 10YR, value of 4, chroma of 2 to 4
Texture=clay loam

Bt horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 4
Texture=clay loam

BC horizon:
Color=hue of 10YR, value of 5, chroma of 3 or 4
Texture=clay loam or loam

Cd horizon:
Color=hue of 10YR, value of 5, chroma of 3
Texture=loam

Mahalasville Series

Depth class: Very deep
Drainage class: Very poorly drained
Parent material: Loess or other silty material and the underlying loamy and sandy outwash
Landform: Depressions on lake plains
Slope: 0 to 2 percent
Adjacent soils: Eldean, Lippincott, Milford, and Savona

Taxonomic Class: Fine-silty, mixed, superactive, mesic Typic Argiaquolls

Typical Pedon
Mahalasville silty clay loam, 0 to 1 percent slopes, about 2 miles northwest of Summitville, in Madison County, Indiana; about 2,000 feet west and 325 feet south of the northeast corner of sec. 7, T. 22 N., R. 8 E.

Ap=0 to 7 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; moderate medium granular structure; friable; neutral; abrupt smooth boundary.

A=7 to 12 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; moderate fine and medium subangular blocky structure; firm; neutral; gradual wavy boundary.

Btg1=12 to 18 inches; gray (5Y 5/1) silty clay loam; moderate fine angular blocky structure; firm; faint very dark brown (10YR 2/2) clay films on faces of peds; common fine prominent reddish brown (5YR 5/4) masses of iron accumulation in the matrix; neutral; gradual wavy boundary.

Btg2=18 to 39 inches; gray (5Y 5/1) silty clay loam; weak medium prismatic structure parting to moderate medium angular blocky; firm; faint and distinct dark gray (10YR 4/1) clay films on faces of peds; common medium prominent brown (7.5YR 4/4) masses of iron accumulation in the matrix; neutral; clear wavy boundary.

2BCg=39 to 44 inches; gray (N 6/0) loam; weak coarse subangular blocky structure; friable; many medium prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; about 1 percent rock fragments; slightly alkaline; abrupt wavy boundary.

2Cg=44 to 60 inches; gray (N 6/0) stratified silt loam and sand; massive; friable; common coarse prominent yellowish brown (10YR 5/8) and brownish yellow (10YR 6/6) masses of iron accumulation in the matrix; about 10 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics
Thickness of the loess or other silty material: 24 to 40 inches
Thickness of the mollic epipedon: 10 to 21 inches
Thickness of the solum: 40 to 60 inches
Content of rock fragments: Ap and Btg horizons=0 percent; 2Btg or 2BCg horizon=0 to 5 percent; 2Cg horizon=0 to 10 percent

Ap or A horizon:
Color=hue of 10YR, value of 2 or 3, chroma of 1 or 2
Texture= silt loam

Btg horizon:
Color=hue of 10YR to 5Y, or is neutral, value of 4 to 6, chroma of 0 to 2
Texture=silty clay loam or silt loam

2Btg horizon where present:
Color=hue of 10YR to 5Y, or is neutral, value of 4 to 6, chroma of 0 to 2
Texture=silty clay loam, clay loam, loam, or silt loam

2BCg horizon:
Color=hue of 10YR to 5Y, or is neutral, value of 4 to 6, chroma of 0 to 2

Texture=loam, sandy loam, or silt loam

2Cg horizon:
Color=hue of 10YR to 5Y, or is neutral, value of 4 to 6, chroma of 0 to 2
Texture=stratified sand, sandy loam, silt loam, or loam, but may have thin strata of the gravelly analogues of these textures

Medway Series

Depth class: Very deep
Drainage class: Moderately well drained
Parent material: Loamy alluvium
Landform: Flood plains
Slope: 0 to 1 percent
Adjacent soils: Eel and Sloan

Taxonomic class: Fine-loamy, mixed, superactive, mesic Fluvaquentic Hapludolls

Typical Pedon
Medway silt loam, 0 to 1 percent slopes, occasionally flooded, about 1.5 miles north of New Paris, in Jefferson Township, Preble County, Ohio; about 2,500 feet north and 1,475 feet west of the southeast corner of sec. 17, T. 9 N., R. 1 E.

Ap=0 to 12 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (l0YR 5/2) dry; weak fine and medium granular structure; friable; common fine and medium roots; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds; 1 percent rock fragments; neutral; abrupt smooth boundary.

Bw1=12 to 25 inches; dark yellowish brown (10YR 4/4) silt loam; weak medium subangular blocky structure; friable; few fine and medium roots; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 5 percent rock fragments; neutral; clear wavy boundary.

Bw2=25 to 38 inches; brown (10YR 5/3) loam; weak medium subangular blocky structure; friable; few fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few fine faint grayish brown (10YR 5/2) iron depletions in the matrix; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 5 percent rock fragments; neutral; clear wavy boundary.

C1=38 to 45 inches; yellowish brown (10YR 5/4) clay loam; massive; friable; few fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 10 percent rock fragments; slightly effervescent; slightly alkaline; clear wavy boundary.

C2=45 to 53 inches; yellowish brown (10YR 5/4) clay loam; massive; friable; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; many medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 5 percent rock fragments, mostly gravel; slightly effervescent; moderately alkaline; clear wavy boundary.

C3=53 to 80 inches; yellowish brown (10YR 5/4) gravelly loam; massive; friable; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 20 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics:
Thickness of the solum: 28 to 60 inches
Thickness of the mollic epipedon: 10 to 24 inches
Depth to carbonates: 30 to 70 inches
Content of rock fragments: Ap and Bw horizons=0 to 14 percent; C horizon=0 to 34 percent

Ap horizon:
Color=hue of l0YR, value of 2 or 3, chroma of 1 to 3
Texture=silt loam

Bw horizon:
Color=hue of 7.5YR to 2.5Y, value of 3 to 5, chroma of 2 to 4
Texture=silt loam or loam, or less commonly has individual horizons of clay loam, silty clay loam, sandy loam, fine sandy loam, or sandy clay loam

C horizon:
Color=hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of l to 6
Texture=stratified loam, silt loam, silty clay loam, clay loam, or sandy loam, or their gravelly analogues

The Medway soils in Preble County are a taxadjunct to the Medway series because the depth to redoximorphic features is deeper than allowed for

the series. They classify as fine-loamy, mixed, superactive, mesic Fluventic Hapludolls. This difference, however, does not significantly affect use and management of the soils.

Miami Series

Depth class: Very deep
Drainage class: Moderately well drained
Parent material: A thin layer of loess and the underlying till, or entirely in till
Landform: Slight rises on the Wisconsinan till plains and on kames
Position on the landform: Backslopes and shoulders
Slope: 2 to 50 percent
Adjacent soils: Celina, Celina, Crosby, Kokomo, and Kendallville

Taxonomic class: Fine-loamy, mixed, active, mesic Oxyaquic Hapludalfs

Typical Pedon
Miami loam, 6 to 12 percent slopes, eroded, about 3.2 miles northwest of New Paris, in Jefferson Township, Preble County, Ohio; about 2,100 feet north and 850 east of the southwest corner of sec. 7. T. 9 N., R. 1 E.

Ap=0 to 5 inches; brown (10YR 4/3) loam, pale brown (10YR 6/3) dry; 10 percent mixing of yellowish brown (10YR 5/4) Bt material; weak fine and medium subangular blocky structure; friable; many fine and medium roots; common faint dark brown (10YR 3/3) organic coatings on faces of peds; 1 percent igneous fragments; slightly acid; abrupt wavy boundary.

Bt=5 to 20 inches; yellowish brown (10YR 5/4) clay loam; moderate medium subangular blocky structure; firm; common fine and medium roots; common distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 2 percent limestone cobbles, 3 percent limestone fragments and 2 percent igneous fragments; moderately acid; clear wavy boundary.

BC=20 to 26 inches; yellowish brown (10YR 5/4) loam; weak coarse subangular blocky structure; firm; few distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; common fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few medium distinct light brownish gray (10YR 6/2) masses of secondary carbonates throughout; 2 percent limestone cobbles, 3 percent limestone fragments, and 5 percent igneous fragments; slightly effervescent; slightly alkaline; clear wavy boundary.

Cd1=26 to 40 inches; brown (10YR 5/3) loam; massive; very firm; common fine faint grayish brown (10YR 5/2) and distinct gray (10YR 6/1) iron depletions in the matrix; common fine distinct and prominent yellowish brown (10YR 5/6 and 5/8) masses of iron accumulation in the matrix; few medium faint light brownish gray (10YR 6/2) masses of secondary carbonates throughout; 10 percent igneous fragments and 2 percent igneous cobbles; strongly effervescent; moderately alkaline; clear wavy boundary.

Cd2=40 to 57 inches; brown (10YR 5/3) loam; massive; very firm; common fine distinct gray (10YR 6/1) iron depletions in the matrix; common fine prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; few medium faint light brownish gray (10YR 6/2) masses of secondary carbonates throughout; 10 percent igneous fragments and 3 percent igneous cobbles; violently effervescent; moderately alkaline; clear wavy boundary.

Cd3=57 to 80 inches; brown (10YR 5/3) gravelly loam; massive; very firm; common fine distinct gray (10YR 6/1) iron depletions in the matrix; common fine prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; few medium faint light brownish gray (10YR 6/2) masses of secondary carbonates throughout; 15 to 20 percent igneous fragments and 3 percent igneous cobbles; violently effervescent; moderately alkaline.

Range in Characteristics
Thickness of the solum: 24 to 40 inches
Depth to carbonates: 20 to 40 inches
Thickness of the loess mantle: 0 to 18 inches
Content of rock fragments: Ap horizon or Bt horizon formed in loess=0 to 5 percent; Bt or 2Bt horizon formed in till, and BC or 2BC horizon=2 to 10 percent; Cd or 2Cd horizon=5 to 20 percent

Ap horizon:
Color=hue of 10YR, value of 3 to 5, chroma of 1 to 4
Texture=silt loam or loam

Bt or 2Bt horizon:
Color=hue of 7.5YR or 10YR, value of 4 to 6, chroma of 3 to 6
Texture=silty clay loam in the upper part if a loess cap is present, or clay loam

BC or 2BC horizon:

Color=hue of 7.5YR to 2.5Y, value of 4 to 6, chroma of 3 or 4
Texture=clay loam or loam

Cd or 2Cd horizon:
Color=hue of 10YR or 2.5Y, value of 5 or 6, chroma of 3 or 4
Texture=loam or gravelly loam

Miamian Series

Depth class: Very deep
Drainage class: Well drained
Parent material: A thin layer of loess and the underlying till, or entirely in till
Landform: Wisconsinan till plains
Position on the landform: Summits, shoulders, and backslopes
Slope: 2 to 50 percent
Adjacent soils: Celina, Crosby, Losantville, Hennepin, Kendallville, and Kokomo

Taxonomic class: Fine, mixed, active, mesic Oxyaquic Hapludalfs

Typical Pedon
Miamian silt loam, 6 to 12 percent slopes, eroded, about 0.5 miles southeast of Camden, in Somers Township, Preble County, Ohio; about 2,100 feet east and 1,200 feet south of the northwest corner of sec. 15, T. 6 N, R. 2 E.

Ap=0 to 6 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; moderate fine subangular blocky structure; friable; many fine roots throughout; common distinct dark brown (10YR 3/3) organic coatings on faces of peds; few medium prominent yellowish red (5YR 5/8) masses of iron accumulation throughout; 2 percent rock fragments; neutral; abrupt smooth boundary.

Bt1=6 to 12 inches; dark yellowish brown (10YR 4/4) clay loam; moderate medium and fine subangular blocky structure; firm; common fine roots throughout; common distinct brown (10YR 4/3) clay films on faces of peds; few distinct dark brown (10YR 3/3) organic coatings on vertical faces of peds; few medium prominent yellowish red (5YR 5/8) masses of iron accumulation throughout; 5 percent rock fragments; neutral; clear wavy boundary.

Figure 28. Profile of Miamian series. The scale is in 6-inch increments.

Bt2=12 to 18 inches; dark yellowish brown (10YR 4/4) clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; common fine roots throughout; common distinct brown (10YR 4/3) clay films on faces of peds; few distinct dark brown (10YR 3/3) organic coatings on vertical faces of peds; few medium prominent reddish yellow (7.5YR 6/8) masses of iron accumulation throughout; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 5 percent rock fragments; neutral; clear wavy boundary.

BC=18 to 29 inches; yellowish brown (10YR 5/4) clay loam; weak coarse subangular blocky structure; firm; few fine roots along vertical faces of peds; few distinct brown (10YR 4/3) clay films on vertical faces of peds; few distinct dark brown (10YR 3/3) organic coatings on vertical faces of peds; common medium prominent reddish yellow (7.5YR 6/8) masses of iron accumulation throughout and around rock fragments; few medium distinct black (10YR 2/1) masses of manganese accumulation throughout; many medium distinct white (10YR 8/1) masses of calcium carbonate accumulation throughout and around rock fragments; 10 percent rock fragments;

strongly effervescent; moderately alkaline; gradual wavy boundary.

Cd=29 to 80 inches; yellowish brown (10YR 5/4) loam; massive; very firm; few fine roots along vertical fractures; common medium distinct grayish brown (10YR 5/2) iron depletions along vertical fractures; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation around the iron depletions; common medium prominent strong brown (7.5YR 5/8) masses of iron accumulation throughout; few medium distinct black (10YR 2/1) masses of manganese accumulation throughout; many fine distinct grayish brown (10YR 5/2) masses of calcium carbonate accumulation along vertical fractures; 12 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics
Thickness of the solum: 20 to 40 inches
Depth to carbonates: 18 to 30 inches
Thickness of the loess mantle: 0 to 15 inches
Content of rock fragments: Ap horizon or Bt horizon formed in loess=0 to 2 percent; Bt or 2Bt horizon formed in till, and BC or 2BC horizon=2 to 12 percent; Cd or 2Cd horizon=5 to 15 percent

Ap horizon:
Color=hue of 10YR, value of 3 to 5, chroma of 2 or 3
Texture=silt loam or clay loam

Bt or 2Bt horizon:
Color=hue of 7.5YR or 10YR, value of 4 or 5, chroma of 3 to 6
Texture=silty clay loam in the upper part if a loess cap is present, clay loam or clay

BC or 2BC horizon:
Color=hue of 7.5YR or 10YR, value of 4 or 5, chroma of 3 to 6
Texture=clay loam or loam

Cd or 2Cd horizon:
Color=hue of 10YR or 2.5Y, value of 4 or 5, chroma of 3 or 4
Texture=loam or gravelly loam

Milford Series

Depth class: Very deep
Drainage class: Very poorly drained
Parent material: Lacustrine sediments, or in lacustrine sediments over gravelly and sandy outwash
Landform: Depressions on glacial lake plains
Slope: 0 to 2 percent
Adjacent soils: Eldean, Lippincott, Mahalasville, and Savona

Taxonomic class: Fine, mixed, superactive, mesic Typic Endoaquolls

Typical Pedon
Milford silty clay loam, gravelly substratum, 0 to 2 percent slopes, about 4.75 miles north northwest of New Paris, in Jefferson Township, Preble County, Ohio; about 780 feet west and 300 feet south of the northeast corner of sec. 6, T. 9 N., R. 1 E.

Ap1=0 to 5 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; weak medium and coarse subangular blocky structure parting to weak fine subangular blocky; friable; many fine and medium roots; many fine pores; neutral; clear wavy boundary.

Ap2=5 to 11 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate medium and coarse subangular blocky structure; firm; many fine and medium roots; slightly acid; abrupt smooth boundary.

BA=11 to 17 inches; very dark gray (10YR 3/1) silty clay loam; moderate medium prismatic structure parting to moderate coarse angular blocky; firm; common fine and medium roots; common distinct black (10YR 2/1) organic coatings on faces of peds; few fine faint black (10YR 2/1) masses of manganese accumulation throughout; neutral; clear smooth boundary.

Bg=17 to 24 inches; dark gray (10YR 4/1) silty clay; strong coarse prismatic structure parting to strong coarse angular blocky; very firm; common fine roots; common distinct black (10YR 2/1) organic coatings on faces of peds; common fine prominent strong brown (7.5YR 5/6) masses of iron accumulation along root channels; few fine faint black (10YR 2/1) masses of manganese accumulation throughout; neutral; clear smooth boundary.

BCg1=24 to 33 inches; gray (2.5Y 6/1) silty clay; massive; firm; common fine roots; few distinct very dark gray (10YR 3/1) organic coatings along root channels; many medium and coarse prominent strong brown (7.5YR 5/6) masses of iron accumulation along root channels; slightly effervescent; slightly alkaline; clear wavy boundary.

BCg2=33 to 46 inches; gray (5Y 5/1) silty clay loam; massive; firm; few fine roots; few prominent very dark gray (10YR 3/1) organic coatings along root channels; many fine and medium prominent strong brown (7.5YR 5/6) masses of iron accumulation

along root channels; slightly effervescent; slightly alkaline; gradual wavy boundary.

Cg=46 to 54 inches; olive gray (5Y 5/2) silt loam; massive; friable; common fine and medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; strongly effervescent; moderately alkaline; clear wavy boundary.

C=54 to 63 inches; light olive brown (2.5Y 5/4) sandy loam with thin strata of brown (10YR 5/3) loamy sand and silty clay loam; massive; friable; common medium distinct olive gray (5Y 5/2) and common fine prominent gray (10YR 5/1) iron depletions in the matrix; common fine and medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few fine prominent black (10YR 2/1) masses of manganese accumulation throughout; 2 percent subangular limestone fragments; strongly effervescent; moderately alkaline; clear wavy boundary.

C'g=63 to 73 inches; olive gray (5Y 5/2) very fine sandy loam; massive; friable; many medium faint gray (5Y 5/1) iron depletions in the matrix; common fine and medium prominent dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; few fine prominent black (10YR 2/1) masses of manganese accumulation throughout; 1 percent subangular shale fragments; strongly effervescent; moderately alkaline; clear wavy boundary.

2C=73 to 80 inches; brown (10YR 4/3) very gravelly loamy sand; single grain; loose; 45 percent subangular limestone and 5 percent shale fragments; strongly effervescent; moderately alkaline.

Range in Characteristics
Thickness of the solum: 36 to 60 inches
Thickness of the mollic epipedon: 10 to 24 inches
Depth to carbonates: 24 to 50 inches
Depth to sandy and gravelly material: 60 to 80 inches
Content of rock fragments: Ap, BA, and Bg horizons=0 percent; BCg horizon=0 to 2 percent; C and Cg horizons=0 to 5 percent; 2C horizon=15 to 59 percent

Ap horizon:
Color=hue of 10YR or 2.5Y, value of 2, 2.5 or 3, chroma of 1 or 2
Texture=silty clay loam

BA horizon where present:
Color=hue of 10YR, value of 2 or 3, chroma of 1 or 2
Texture=silty clay loam

Bg horizon:
Color=hue of 10YR to 5Y, value of 4 to 6, chroma of 1 or 2
Texture=silty clay loam or silty clay

BC or BCg horizon:
Color=hue of 10YR to 5Y, value of 4 to 6, chroma of 1 to 4
Texture=silty clay loam, silty clay, or silt loam

Cg or C horizon:
Color=hue of 10YR to 5Y, value of 4 to 6, chroma of 1 to 4
Texture=clay loam, silt loam, sandy loam, silty clay loam, or very fine sandy loam, and may be stratified with textures ranging from loamy sand to silty clay loam

2C horizon (in gravelly substratum phase):
Color=hue of 10YR, value of 4 or 5, chroma of 3 or 4
Texture=gravelly or very gravelly loamy sand

Millsdale Series

Depth class: Moderately deep
Drainage class: Very poorly drained
Parent material: Till over limestone
Landform: Depressions and flats on Wisconsinan terraces and till plains
Slope: 0 to 2 percent
Adjacent soils: Randolph, Milton, and Plattville

Taxonomic class: Fine, mixed, active, mesic Typic Argiaquolls

Typical Pedon
Millsdale silt loam, 0 to 2 percent slopes, about 2.7 miles south of West Alexandria, in Lanier Township, Preble County, Ohio; 2,000 feet east and 1,450 feet south of the northwest corner of sec. 15, T. 5 N., R. 3 E.

Ap=0 to 9 inches; black (2.5Y 2.5/1) silt loam, very dark gray (2.5Y 3/1) dry; weak fine subangular blocky structure; friable; common fine roots; few faint black (10YR 2/1) organic coatings on faces of peds; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation on faces of peds; neutral; clear smooth boundary.

A=9 to 16 inches; black (2.5Y 2.5/1) silt loam, very dark gray (2.5Y 3/1) dry; weak fine and medium subangular blocky structure; friable; common fine roots; common faint black (10YR 2/1) organic coatings on faces of peds; few fine prominent

yellowish brown (10YR 5/6) masses of iron accumulation on faces of peds; neutral; clear smooth boundary.

Btg1=16 to 22 inches; dark gray (2.5Y 4/1) silty clay; moderate medium subangular blocky structure; firm; few fine roots; many faint dark gray (10YR 4/1) clay films throughout; many distinct very dark gray (10YR 3/1) organic coatings throughout; many fine prominent brownish yellow (10YR 6/8) masses of iron accumulation on faces of peds; 5 percent rock fragments; neutral; clear smooth boundary.

Btg2=22 to 25 inches; grayish brown (2.5Y 5/2) clay; moderate medium and coarse subangular blocky structure; firm; few fine roots; many distinct dark gray (10YR 4/1) clay films throughout; few distinct very dark gray (10YR 3/1) organic coatings throughout; many fine prominent brownish yellow (10YR 6/8) masses of iron accumulation throughout; few fine prominent black (10YR 2/1) masses of manganese accumulation throughout; 10 percent rock fragments; neutral; abrupt wavy boundary.

2R=25 to 29 inches; light gray (10YR 7/2) limestone bedrock.

Range in Characteristics:
Thickness of the mollic epipedon: 10 to 20 inches
Depth to bedrock: 20 to 40 inches
Content of rock fragments: Ap horizon=0 to 1 percent; Btg horizon=1 to 10 percent

Ap or A horizon:
Color=hue of l0YR or 2.5Y, value of 2, 2.5 or 3, chroma of 1 or 2
Texture=silt loam or silty clay loam

Btg horizon:
Color=hue of l0YR or 2.5Y, value of 4 or 5, chroma of 1 or 2
Texture=silty clay, clay, or clay loam

2R horizon:
Limestone bedrock

Milton Series

Depth class: Moderately deep
Drainage class: Well drained
Parent material: A thin layer of loess and the underlying till over limestone
Landform: Wisconsin till plains
Position on the landform: Summits, shoulders, and backslopes
Slope: 0 to 25 percent

Adjacent soils: Randolph, Millsdale, and Plattville

Taxonomic class: Fine, mixed, active, mesic Typic Hapludalfs

Typical Pedon
Milton silt loam, 2 to 6 percent slopes, about 3.3 miles south of West Alexandria, in Lanier Township, Preble County, Ohio; 1,900 feet south and 305 feet west of the northeast corner of sec. 21, T. 5 N., R. 3 E.

Ap=0 to 9 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine and medium subangular blocky structure; friable; common very fine to medium roots; few fine prominent strong brown (7.5YR 4/6) masses of iron accumulation throughout; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; neutral; abrupt smooth boundary.

Bt1=9 to 16 inches; dark yellowish brown (10YR 4/4) silty clay; moderate medium and coarse subangular blocky structure; firm; common fine and very fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; few faint brown (10YR 5/3) silt coatings on faces of peds; few fine distinct strong brown (7.5YR 4/6) masses of iron accumulation throughout; common fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 1 percent igneous fragments; neutral; clear smooth boundary.

Bt2=16 to 21 inches; yellowish brown (10YR 5/4) clay loam; moderate fine and medium subangular blocky structure; firm; few fine and very fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation throughout; common fine distinct black (10YR 2/1) masses of manganese accumulation throughout; common fine distinct light gray (10YR 7/1) masses of calcium carbonate accumulation in the matrix; 1 percent shale fragments and 2 percent limestone fragments; neutral; clear wavy boundary.

BC=21 to 28 inches; yellowish brown (10YR 5/4) loam; weak fine and medium subangular blocky structure; friable; common fine roots in cracks; few distinct brown (10YR 4/3) clay films on vertical faces of peds; few fine distinct light brownish gray (10YR 6/2) iron depletions on vertical faces of peds; common fine prominent yellowish brown (10YR 5/8) masses of iron accumulation between peds; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; common distinct light gray (10YR 7/2) calcium carbonate coatings on faces of peds; 1 percent shale fragments and 5 percent

limestone fragments; slightly effervescent; slightly alkaline; abrupt smooth boundary.

2R=28 to 32 inches; white (10YR 8/1) limestone bedrock.

Range in Characteristics
Depth to bedrock: 20 to 40 inches
Thickness of the solum: 20 to 40 inches
Depth to carbonates: 18 to 30 inches
Thickness of the loess mantle: 6 to 12 inches
Content of rock fragments: Ap horizon=0 to 5 percent; Bt horizon=1 to 10 percent; BC horizon=5 to 25 percent

Ap horizon:
Color=hue of 7.5YR or 10YR, value of 4 or 5, chroma of 2 or 3
Texture=silt loam

Bt horizon:
Color=hue of 7.5YR or 10YR, value of 3 to 5, chroma of 3 to 6
Texture=clay loam, clay, or silty clay

BC horizon:
Color=hue of 7.5YR or 10YR, value of 4 or 5, chroma of 3 to 6
Texture=clay loam or loam, or their gravelly or channery analogues

2R horizon:
Limestone bedrock

Morningsun Series

Depth class: Very deep
Drainage class: Moderately well drained
Parent material: Loess and the underlying water modified till
Landform: Flats and slight rises on the Wisconsinan ground moraines
Position on the landform: Summits and shoulders
Slope: 0 to 6 percent
Adjacent soils: Cyclone, Fincastle, Sugarvalley, and Xenia

Taxonomic class: Fine-silty, mixed, superactive, mesic Oxyaquic Hapludalfs

Typical Pedon
Morningsun silt loam, 0 to 2 percent slopes, about 1 mile southwest of West Florence, in Dixon Township, Preble County, Ohio; about 1,000 feet west and 250 feet south of the northeast corner of sec. 8, T. 7 N., R. 1 E.

Ap=0 to 10 inches; dark yellowish brown (10YR 4/4) silt loam, light yellowish brown (10YR 6/4) dry; weak fine and medium subangular blocky structure; friable; common fine and few medium roots throughout; very strongly acid; abrupt smooth boundary.

Bt1=10 to 17 inches; yellowish brown (10YR 5/4) silt loam; moderate medium subangular blocky structure; friable; common fine roots throughout; common distinct yellowish brown (10YR 5/6) clay films on faces of peds; common distinct brown (10YR 5/3) clay depletions on faces of peds; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; very strongly acid; abrupt smooth boundary.

Bt2=17 to 24 inches; yellowish brown (10YR 5/6) silt loam; moderate medium subangular blocky structure; friable; few very fine roots throughout; many distinct yellowish brown (10YR 5/6) clay films on faces of peds; few fine prominent black (10YR 2/1) masses of manganese accumulation throughout; very strongly acid; clear smooth boundary.

Bt3=24 to 33 inches; yellowish brown (10YR 5/6) silt loam; moderate medium subangular blocky structure; firm; few very fine roots throughout; many distinct yellowish brown (10YR 5/6) clay films on faces of peds; few fine prominent black (10YR 2/1) masses of manganese accumulation throughout; 2 percent igneous gravel; neutral; clear wavy boundary.

2Bt4=33 to 42 inches; yellowish brown (10YR 5/8) silt loam; weak coarse subangular blocky structure; firm; few very fine roots throughout; few distinct yellowish brown (10YR 5/6) clay films on faces of peds; common fine prominent grayish brown (10YR 5/2) iron depletions in the matrix; common fine distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few fine prominent black (10YR 2/1) masses of manganese accumulation throughout; about 37 percent sand; 10 percent subrounded igneous gravel; slightly alkaline; clear wavy boundary.

2BC=42 to 51 inches; dark yellowish brown (10YR 3/4) gravelly sandy loam; weak coarse subangular blocky structure; friable; few very fine roots; few distinct dark yellowish brown (10YR 4/6) clay bridging between sand grains and clay films coating pebbles; few fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation throughout; few fine distinct black

(10YR 2/1) masses of manganese accumulation throughout; 20 percent subrounded igneous gravel; strongly effervescent; slightly alkaline; abrupt smooth boundary.

2C1=51 to 63 inches; dark yellowish brown (10YR 4/6) sandy loam; massive; friable; 10 percent subrounded igneous gravel; strongly effervescent; slightly alkaline; abrupt smooth boundary.

2C2=63 to 80 inches; dark yellowish brown (10YR 4/6) gravelly loam with pockets of sandy loam and loamy sand; massive; firm; 10 percent subrounded and 5 percent subangular igneous gravel; strongly effervescent; slightly alkaline.

Range in Characteristics
Thickness of the solum: 35 to 80 inches
Depth to carbonates: 40 to 60 inches
Thickness of the loess mantle: 25 to 50 inches
Content of rock fragments: Ap and Bt horizons=0 to 2 percent;
2Bt horizon=0 to 10 percent; 2BC and 2C horizons=5 to 25 percent

Ap horizon:
Color=hue of 10YR, value of 4, chroma of 3 or 4
Texture=silt loam

Bt horizon:
Color=hue of 7.5YR or 10YR, value of 4 or 5, chroma of 3 to 6
Texture=silt loam or silty clay loam

2Bt horizon:
Color=hue of 7.5YR or 10YR, value of 4 or 5, chroma of 3 to 8
Texture=silt loam, loam, or clay loam

2BC horizon:
Color=hue of 10YR, value of 3 to 5, chroma of 3 or 4
Texture=loam, clay loam, or sandy loam, or their gravelly analogues

2C horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 3 to 6
Texture=loam or sandy loam or their gravelly analogues, with strata or pockets of loamy sand or sandy loam in some pedons

Ockley Series

Depth class: Very deep
Drainage class: Well drained
Parent material: A thin layer of loess and loamy outwash over stratified sand and gravel
Landform: Wisconsinan outwash terraces
Position on the landform: Treads
Slope: 0 to 6 percent
Adjacent soils: Fox, Eldean, Thackery, and Warsaw

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

Typical Pedon
Ockley silt loam, 0 to 2 percent slopes, about 1.4 miles southwest of West Elkton, in Gratis Township, Preble County, Ohio; about 2,275 feet west and 1,700 feet south of the northeast corner of sec. 31, T. 4 N., R. 3 E.

Ap=0 to 5 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine and medium subangular blocky structure parting to weak medium granular; friable; many fine and medium roots; 1 percent subangular limestone gravel; slightly acid; clear smooth boundary.

Ap2=5 to 9 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak medium and coarse subangular blocky structure parting to weak thin and medium platy; friable; common fine and medium roots; 1 percent subangular limestone gravel; neutral; abrupt smooth boundary.

Bt1=9 to 15 inches; yellowish brown (10YR 5/4) clay loam; weak fine and medium subangular blocky structure; friable; common fine and medium roots; common distinct brown (10YR 4/3) clay films on faces of peds; few faint brown (10YR 5/3) clay depletions on faces of peds; 1 percent subangular limestone gravel; neutral; clear smooth boundary.

Bt2=15 to 22 inches; yellowish brown (10YR 5/4) clay loam; moderate fine and medium subangular blocky structure; firm; common fine roots; common distinct brown (7.5YR 4/3) clay films on faces of peds; slightly acid; clear smooth boundary.

Bt3=22 to 31 inches; brown (7.5YR 4/4) clay loam; moderate medium subangular blocky structure; firm; common fine roots; many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; few fine prominent black (10YR 2/1) masses of manganese accumulation in the matrix; 2 percent subangular shale fragments and 6 percent subrounded limestone gravel; slightly acid; clear wavy boundary.

Bt4=31 to 38 inches; dark yellowish brown (10YR 4/4) sandy clay loam; weak fine and medium subangular blocky structure; friable; few fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; 2 percent subangular shale

fragments, 3 percent igneous gravel, and 4 percent subrounded limestone gravel; slightly acid; gradual wavy boundary.

Bt5=38 to 48 inches; brown (10YR 4/3) clay loam and sandy clay loam; weak fine subangular blocky structure; friable; few fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; 3 percent subangular shale fragments, 5 percent igneous gravel, and 4 percent subrounded limestone gravel; slightly acid; gradual wavy boundary.

2C1=48 to 58 inches; brown (10YR 5/3) stratified gravelly loamy sand and sand; single grain; loose; 2 percent subangular shale fragments, 8 percent igneous gravel, and 20 percent subrounded limestone gravel; strongly effervescent; moderately alkaline; gradual wavy boundary.

2C2=58 to 80 inches; brown (10YR 5/3) stratified very gravelly sand and loamy sand; single grain; loose; few fine prominent reddish yellow (7.5YR 6/8) iron concretions in the matrix; 2 percent subangular shale fragments, 10 percent igneous gravel, and 35 percent subrounded limestone gravel; violently effervescent; moderately alkaline.

Range in Characteristics
Thickness of the solum: 40 to 72 inches
Depth to carbonates: 40 to 72 inches
Thickness of the loess mantle: 0 to 20 inches
Content of rock fragments, mostly gravel: Ap horizon=0 to 10 percent; Bt horizon=0 to 10 percent in the upper part and 10 to 45 percent in the lower part; 2C horizon=30 to 70 percent

Ap horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 2 to 4
Texture=silt loam

Bt horizon:
Color=hue of 7.5YR or 10YR, value of 4 or 5, chroma of 3 to 6
Texture=clay loam or sandy clay loam, or their gravelly or very gravelly analogues

2C horizon:
Color=hue of 10YR, value of 4 to 6, chroma of 3 or 4
Texture=gravelly to extremely gravelly analogues of loamy sand or sand, with strata of loamy sand or sand

Plattville Series

Depth class: Deep
Drainage class: Well drained
Parent material: A thin layer of loess and the underlying outwash and residuum weathered from limestone
Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Backslopes
Slope: 2 to 6 percent
Adjacent soils: Millsdale, Milton, and Randolph

Taxonomic class: Fine-loamy, mixed, active, mesic Typic Argiudolls

Typical Pedon
Plattville silt loam, moderately wet, 2 to 6 percent slopes, about 2.5 miles south of West Alexandria, in Lanier Township, Preble County, Ohio; about 2,000 feet north and 500 feet west of the southeast corner of sec. 16, T. 5 N., R. 3 E.

Ap=0 to 9 inches; very dark grayish brown (10YR 3/2) silt loam, dark grayish brown (10YR 4/2) dry; weak fine and medium subangular blocky structure; friable; many fine roots; many faint very dark gray (10YR 3/1) organic coatings throughout; 1 percent rock fragments; slightly acid; abrupt smooth boundary.

A=9 to 18 inches; very dark gray (10YR 3/1) silt loam, dark gray (10YR 4/1) dry; weak fine and medium subangular blocky structure; friable; common fine roots; many faint black (10YR 2/1) organic coatings throughout; 1 percent rock fragments; slightly acid; clear smooth boundary.

Bt1=18 to 31 inches; yellowish brown (10YR 5/4) clay loam; moderate medium subangular blocky structure; firm; few fine roots; many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few faint brown (10YR 5/3) clay depletions in the matrix; few fine prominent brownish yellow (10YR 6/8) and few fine prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; common very dark gray (10YR 3/1) krotovinas; 1 percent rock fragments; slightly acid; clear smooth boundary.

Bt2=31 to 43 inches; yellowish brown (10YR 5/4) clay loam; moderate medium subangular blocky structure; firm; few fine roots; many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; few faint brown (10YR 5/3) clay depletions in the matrix; few fine prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; common fine distinct black (10YR 2/1) masses of manganese accumulation in the matrix; 1 percent rock fragments; neutral; clear smooth boundary.

BC1=43 to 50 inches; yellowish brown (10YR 5/4) clay loam; weak coarse subangular blocky structure; firm; few fine roots; many distinct dark yellowish brown (10YR 4/4) clay films on vertical faces of peds; few fine distinct brown (10YR 5/2) iron depletions in the matrix; many fine and medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine distinct black (10YR 2/1) masses of manganese accumulation in the matrix; common medium faint very pale brown (10YR 7/3) masses of secondary carbonates throughout; 10 percent rock fragments; slightly alkaline; clear wavy boundary.

2BC2=50 to 54 inches; brown (10YR 5/3) clay; weak coarse subangular structure; firm; common fine distinct light brownish gray (10YR 6/2) iron depletions in the matrix; few fine prominent yellowish red (5YR 5/8) and few fine prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine distinct black (10YR 2/1) masses of manganese accumulation in the matrix; 5 percent rock fragments; slightly alkaline; clear smooth boundary.

2R=54 to 58 inches; light gray (10YR 7/2) limestone bedrock.

Range in Characteristics

Depth to bedrock: 40 to 60 inches
Thickness of the mollic epipedon: 10 to 20 inches
Thickness of the loess mantle: 0 to 18 inches
Content of rock fragments: Ap horizon=0 to 2 percent; Bt horizon=0 to 7 percent; BC and 2BC horizons=2 to 10 percent

Ap or A horizon:
Color=hue of 10YR, value of 2 or 3, chroma of 1 to 3
Texture=silt loam

Bt horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 3 or 4
Texture=loam, clay loam, or silty clay loam

BC horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 3 or 4
Texture=loam or clay loam

2BC horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 3 or 4
Texture=clay

2R horizon:
Limestone bedrock

The Plattville soils in Preble County are a taxadjunct to the Plattville series because of the presence of redoximorphic features in the lower part of the solum which is not defined for the series. They classify as fine-loamy, mixed, active, mesic Oxyaquic Argiudolls. This difference, however, does not significantly affect use and management of the soils.

Rainsville Series

Depth class: Very deep
Drainage class: Moderately well drained
Parent material: A thin layer of loess and the underlying loamy outwash and till
Landform: Wisconsinan ground moraines
Position on the landform: Summits and backslopes
Slope: 0 to 6 percent
Adjacent soils: Fox and Kendallville

Taxonomic class: Fine-loamy, mixed, active, mesic Oxyaquic Hapludalfs

Typical Pedon
Rainsville silt loam, 2 to 6 percent slopes, about 1.5 miles southwest of West Alexandria, in Lanier Township, Preble County, Ohio; about 330 feet west and 2,245 feet north of the southeast corner of sec. 9, T. 5 N., R. 3 E.

Ap=0 to 10 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine subangular blocky structure; friable; many fine to coarse roots; many faint dark grayish brown (10YR 4/2) organic coatings on faces of peds; strongly acid; abrupt smooth boundary.

Bt1=10 to 16 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine and medium subangular blocky structure; friable; many fine and common medium and coarse roots; common distinct brown (10YR 4/3) clay films on faces of peds; common distinct dark grayish brown (10YR 4/2) organic coatings on faces of peds and along root channels; strongly acid; clear smooth boundary.

2Bt2=16 to 26 inches; brown (7.5YR 5/4) loam; moderate medium subangular blocky structure; firm; common fine to coarse roots; many distinct brown (10YR 4/3) clay films on faces of peds; few fine prominent yellowish red (5YR 5/8) masses of iron accumulation in the matrix; few fine prominent black (10YR 2/1) masses of manganese accumulation in the matrix; 1 percent rounded limestone gravel and 2 percent rounded igneous gravel; very strongly acid; clear wavy boundary.

2Bt3=26 to 35 inches; brown (7.5YR 5/4) clay loam; moderate medium and coarse subangular blocky

structure; firm; common fine and coarse roots; many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; few fine faint brown (10YR 5/3) iron depletions in the matrix; few fine and medium prominent red (2.5YR 4/6) masses of iron accumulation in the matrix; few fine prominent black (10YR 2/1) masses of manganese accumulation in the matrix; common medium and coarse prominent cylindrical yellowish red (5YR 5/8) ironstone nodules in the matrix; 2 percent rounded limestone gravel and 3 percent rounded igneous gravel; very strongly acid; clear wavy boundary.

2Bt4=35 to 44 inches; brown (7.5YR 4/4) clay loam; moderate medium and coarse subangular blocky structure; firm; common fine roots; many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; few fine distinct light brownish gray (10YR 6/2) and common fine faint brown (10YR 5/3) iron depletions in the matrix; common fine and medium prominent red (2.5YR 4/6) masses of iron accumulation in the matrix; few fine prominent irregular yellowish red (5YR 5/8) ironstone nodules in the matrix; 2 percent rounded limestone gravel and 5 percent rounded igneous gravel; strongly acid; clear wavy boundary.

3Bt5=44 to 50 inches; brown (10YR 5/3) loam; weak fine and medium subangular blocky structure; firm; common fine roots; common distinct dark yellowish brown (10YR 4/4) clay films on vertical faces of peds; 2 percent rounded limestone gravel and 8 percent rounded igneous gravel; neutral; clear wavy boundary.

3C1=50 to 59 inches; brown (10YR 5/3) gravelly loam; massive; firm; 2 percent subangular igneous fragments and 13 percent subangular limestone fragments; strongly effervescent; slightly alkaline; gradual wavy boundary.

3C2=59 to 80 inches; brown (10YR 5/4) gravelly loam with common pockets of gravelly sandy loam; massive; firm; 5 percent subangular igneous fragments and 15 percent subangular limestone fragments; strongly effervescent; slightly alkaline.

Range in Characteristics
Thickness of the solum: 45 to 60 inches
Depth to carbonates: 32 to 50 inches
Thickness of the loess mantle: 0 to 20 inches
Content of rock fragments: Ap horizon or Bt horizon formed in loess=0 to 2 percent; Bt or 2Bt horizon formed in outwash=1 to 10 percent; 2Bt or 3Bt horizon formed in till =2 to 10 percent; 2C or 3C horizon formed in till=3 to 20 percent

Ap or A horizon:
Color=hue of 10YR, value of 4, chroma of 2 or 3
Texture=silt loam

Bt horizon formed in loess, where present:
Color=hue of 7.5YR or 10YR, value of 4 or 5, chroma of 4
Texture=silty clay loam or silt loam

Bt or 2Bt horizon formed in outwash:
Color=hue of 7.5YR or 10YR, value of 4 or 5, chroma of 4 to 6
Texture=clay loam or loam

2Bt or 3Bt horizon formed in till:
Color=hue of 10YR, value of 4 or 5, chroma of 3 or 4
Texture=clay loam or loam

2C or 3C horizon formed in till:
Color=hue of 10YR, value of 5, chroma of 3 or 4
Texture=loam, gravelly loam, or gravelly sandy loam

Randolph Series

Depth class: Moderately deep
Drainage class: Somewhat poorly drained
Parent material: Till over limestone
Landform: Flats and rises on the Wisconsinan till plains
Position on the landform: Summits
Slope: 0 to 6 percent
Adjacent soils: Millsdale and Milton

Taxonomic class: Fine, mixed, active, mesic Aeric Endoaqualfs

Typical pedon
Randolph silt loam, 0 to 2 percent slopes, about 3 miles south and 0.25 mile west of West Alexandria, in Lanier Township, Preble County, Ohio; about 940 feet west and 200 feet south of the northeast corner of sec. 21, T. 5 N., R. 3 E.

Ap=0 to 6 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; moderate fine and medium subangular blocky structure parting to moderate medium granular; friable; common fine roots; few fine faint black (10YR 2/1) manganese concretions in the matrix; few fine faint black (10YR 2/1) masses of manganese accumulation in the matrix; 1 percent rock fragments; moderately acid; clear wavy boundary.

AB=6 to 10 inches; dark gray (10YR 4/1) silt loam; moderate medium subangular blocky structure; firm; common fine roots; common fine prominent yellowish red (5YR 4/6) masses of iron accumulation in the matrix; few fine and medium faint black (10YR 2/1) masses of manganese accumulation in the

matrix; 1 percent rock fragments; very strongly acid; clear smooth boundary.

Bt1=10 to 21 inches; brown (10YR 4/3) silty clay; strong coarse subangular blocky structure; very firm; common fine roots; many distinct dark gray (10YR 4/1) clay films on faces of peds; many fine and medium faint grayish brown (10YR 5/2) iron depletions in the matrix; many medium prominent yellowish brown (10YR 5/8) masses of iron accumulation throughout; 1 percent rock fragments; very strongly acid; clear wavy boundary.

Bt2=21 to 27 inches; light olive brown (2.5Y 5/4) silty clay loam; moderate medium subangular blocky structure; firm; common fine roots; many distinct dark gray (10YR 4/1) clay films on faces of peds; common fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; common fine and medium prominent yellowish brown (10YR 5/8) masses of iron accumulation throughout; 1 percent rock fragments; slightly acid; clear wavy boundary.

Bt3=27 to 33 inches; light olive brown (2.5Y 5/4) silty clay loam; moderate fine and medium subangular blocky structure; firm; common fine roots; common distinct very dark gray (10YR 3/1) clay films on vertical faces of peds; many distinct dark gray (10YR 4/1) clay films on faces of peds; common fine distinct grayish brown (10YR 5/2) iron depletions in matrix; common fine prominent yellowish brown (10YR 5/8) masses of iron accumulation throughout; 1 percent rock fragments; neutral; clear smooth boundary.

2R=33 to 35 inches; light gray (10YR 7/1) limestone bedrock.

Range in Characteristics
Thickness of the solum: 20 to 40 inches
Depth to bedrock: 20 to 40 inches
Content of rock fragments: Ap horizon=0 to 3 percent; Bt horizon=0 to 3 percent in the upper part and 1 to 14 percent in the lower part

Ap horizon:
Color=hue of 10YR or 2.5Y, value of 4 or 5, chroma of 1 to 3
Texture=silt loam

Bt horizon:
Color=hue of 10YR or 2.5Y, value of 4 or 5, chroma of 2 to 4
Texture=silty clay loam, clay loam, silty clay, or clay

2R horizon:
Limestone bedrock

Rodman Series

Depth class: Very deep
Drainage class: Excessively drained
Parent material: Outwash
Landform: Outwash plains and kames
Position on the landform: Backslopes
Slope: 18 to 50 percent
Adjacent soils: Kendallville and Rainsville

Taxonomic class: Sandy-skeletal, mixed, mesic Typic Hapludolls

Typical Pedon
Rodman gravelly loam, from an area of Rodman-Kendallville complex, 25 to 50 percent slopes, eroded, about .8 mile north of New Paris, in Jefferson Township, Preble County, Ohio; about 925 feet east and 1,050 feet south of the northwest corner of sec. 20. T. 9 N., R. 1 E.

Oe=0 to 1 inch; decomposed leaves, grasses, and twigs.

A=1 to 4 inches; very dark gray (10YR 3/1) gravelly loam, dark gray (10YR 4/1) dry; weak very fine granular structure; very friable; many fine and medium and common coarse roots throughout; 30 percent gravel; neutral; abrupt wavy boundary.

Bw=4 to 12 inches; dark brown (7.5YR 3/2) very gravelly loam, brown (7.5YR 5/2) dry; weak fine subangular blocky structure; very friable; many fine to coarse roots throughout; many faint very dark brown (7.5YR 2.5/2) organic coatings on faces of peds; 40 percent gravel; neutral; abrupt wavy boundary.

C1=12 to 15 inches; yellowish brown (10YR 5/4) very gravelly sandy loam; single grain; loose; many fine roots; 50 percent gravel; strongly effervescent; moderately alkaline; abrupt wavy boundary.

C2=15 to 25 inches; yellowish brown (10YR 5/4) extremely gravelly loamy coarse sand; single grain; loose; common fine and medium roots; 60 percent gravel; violently effervescent; moderately alkaline; abrupt smooth boundary.

C3=25 to 80 inches; yellowish brown (10YR 5/4) extremely gravelly loamy coarse sand; single grain; loose; common medium roots; 75 percent gravel; violently effervescent; moderately alkaline.

Range in Characteristics
Thickness of the solum: 10 to 20 inches
Thickness of the mollic epipedon: 10 to 14 inches
Depth to carbonates: 10 to 20 inches

Content of rock fragments: A horizon=15 to 30 percent; Bw horizon=10 to 40 percent; C horizon=35 to 78 percent

A horizon:
Color=hue of 10YR, value of 2 or 3, chroma of 1 or 2
Texture=gravelly loam

Bw horizon:
Color=hue of 7.5YR or 10YR, value of 2 to 4, chroma of 1 to 3
Texture=loam, coarse sandy loam or sandy loam, or their gravelly or very gravelly analogues

C horizon:
Color=hue of 10YR, value of 3 to 6, chroma of 1 to 4
Texture=very gravelly or extremely gravelly analogues of sandy loam, loamy coarse sand, or sand; the sandy loam fine-earth texture occurs in the upper part only

Rossburg Series

Depth class: Very deep
Drainage class: Well drained
Parent material: Loamy alluvium over sandy and gravelly alluvium
Landform: Flood plains
Slope: 0 to 1 percent
Adjacent soils: Medway, Sloan, and Stonelick

Taxonomic class: Fine-loamy, mixed, superactive, mesic Fluventic Hapludolls

Typical Pedon
Rossburg silt loam, moderately wet, sandy substratum, 0 to 1 percent slopes, occasionally flooded, about 0.75 mile northwest of Gratis, in Gratis Township, Preble County, Ohio; about 126 feet west and 420 feet south of the northeast corner of sec. 4, T. 4 N., R. 3 E.

Ap=0 to 8 inches; dark brown (10YR 3/3) silt loam, brown (10YR 5/3) dry; moderate fine subangular blocky structure; friable; common fine and medium roots; many distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; neutral; abrupt smooth boundary.

A=8 to 18 inches; dark brown (10YR 3/3) silt loam, brown (10YR 4/3) dry; moderate medium subangular blocky structure; friable; many fine, common medium, and few coarse roots; many distinct very dark grayish brown (10YR 3/2) organic coatings throughout; 2 percent gravel; slightly alkaline; clear wavy boundary.

Bw1=18 to 27 inches; brown (10YR 4/3) silt loam; weak coarse prismatic structure parting to moderate medium subangular blocky; friable; common very fine and fine and few medium roots; many distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; 2 percent gravel; slightly alkaline; clear wavy boundary.

Bw2=27 to 35 inches; dark yellowish brown (10YR 4/4) loam; weak coarse prismatic structure; friable; few fine and medium roots; common distinct very dark grayish brown (10YR 3/2) organic coatings throughout; 2 percent gravel; slightly alkaline; abrupt wavy boundary.

C1=35 to 41 inches; yellowish brown (10YR 5/4) loam; massive; friable; few fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings along worm and root channels; 4 percent gravel; strongly effervescent; moderately alkaline; clear wavy boundary.

C2=41 to 52 inches; brown (10YR 5/3) sandy loam; massive; friable; common medium faint grayish brown (10YR 5/2) iron depletions throughout; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation throughout; 2 percent gravel; strongly effervescent; moderately alkaline; abrupt wavy boundary.

2C3=52 to 63 inches; brown (10YR 5/3) and grayish brown (10YR 5/2) sand; single grain; loose; 2 percent gravel; strongly effervescent; moderately alkaline; abrupt wavy boundary.

2C4=63 to 80 inches; yellowish brown (10YR 5/4) extremely gravelly sand; single grain; loose; common fine roots; common medium distinct grayish brown (10YR 5/2) iron depletions throughout; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation throughout; 60 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics
Thickness of the solum: 24 to 60 inches
Thickness of the mollic epipedon: 10 to 24 inches
Depth to sandy materials: 40 to 65 inches
Depth to carbonates: 30 to 60 inches
Content of rock fragments: Ap horizon=0 to 5 percent; Bw horizon=0 to 10 percent; C horizon=0 to 20 percent above depth of 48 inches, 0 to 34 percent below depth of 48 inches with up to 60 percent in individual strata

Ap or A horizon:
Color=hue of 10YR, value of 2 or 3, chroma of 1 to 3

Texture=silt loam

Bw horizon:
Color=hue of 10YR, value of 3 to 5, chroma of 2 to 6
Texture=silt loam or loam; may be fine sandy loam or sandy loam in the lower part in some pedons

C horizon:
Color=hue of 10YR, value of 4 to 6, chroma of 3 to 6
Texture=loam, silt loam, fine sandy loam, sandy loam, or loamy sand, or their gravelly to very gravelly analogues

2C horizon:
Color=hue of 10YR, value of 4 to 6, chroma of 2 to 6
Texture=sand, or its gravelly to extremely gravelly analogues

Russell Series

Depth class: Very deep
Drainage class: Well drained
Parent material: Loess and the underlying till
Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Summits and shoulders
Slope: 2 to 6 percent
Adjacent soils: Fincastle, Miamian, and Xenia

Taxonomic class: Fine-silty, mixed, superactive, mesic Typic Hapludalfs

Typical Pedon
Russell silt loam, from an area of Russell-Miamian silt loams, 2 to 6 percent slopes, about 1.5 miles southwest of Fairhaven, in Israel Township, Preble County, Ohio; about 2,366 feet south and 88 west of the northeast corner of sec. 7, T. 6 N., R. 1 E.

Ap=0 to 8 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine and medium subangular blocky structure; friable; common fine roots; neutral; abrupt smooth boundary.

Bt1=8 to 21 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; firm; few fine roots; common distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; neutral; clear wavy boundary.

Bt2=21 to 35 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; firm; few fine roots; many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; slightly acid; clear wavy boundary.

2Bt3=35 to 50 inches; yellowish brown (10YR 5/4) clay loam; moderate medium subangular blocky structure; firm; many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 3 percent rock fragments; moderately acid; clear wavy boundary.

2Bt4=50 to 58 inches; dark yellowish brown (10YR 4/4) clay loam; weak medium and fine subangular blocky structure; firm; common faint dark yellowish brown (10YR 4/4) clay films on faces of peds; few medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 5 percent rock fragments; slightly acid; abrupt wavy boundary.

2Cd1=58 to 65 inches; brown (10YR 5/3) loam; massive; firm; few medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 10 percent rock fragments; strongly effervescent; moderately alkaline; clear wavy boundary.

2Cd2=65 to 80 inches; brown (10YR 5/3) gravelly loam; massive; firm; few fine faint grayish brown (10YR 5/2) iron depletions throughout; few medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in rinds around the depletions; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 15 percent rock fragments; violently effervescent; moderately alkaline.

Range in Characteristics
Thickness of the solum: 40 to 60 inches
Depth to carbonates: 40 to 60 inches
Thickness of the loess mantle: 20 to 40 inches
Content of rock fragments: Ap and Bt horizons=0 to 2 percent; 2Bt horizon=2 to 10 percent; 2Cd horizon=2 to 15 percent

Ap horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 2 or 3
Texture=silt loam

Bt horizon:
Color=hue of 7.5YR to 2.5Y, value of 4 or 5, chroma of 3 to 6
Texture=silt loam or silty clay loam

2Bt horizon:
Color=hue of 7.5YR to 2.5Y, value of 4 or 5, chroma of 3 to 6
Texture=clay loam, loam or silty clay loam

2Cd horizon:
Color=hue of 10YR or 2.5Y, value of 5, chroma of 3 to 6
Texture=loam or gravelly loam

Savona Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Parent material: Silty material and the underlying outwash high in limestone gravel and sand
Landform: Wisconsinan outwash terraces
Position on the landform: Treads
Slope: 0 to 2 percent
Adjacent soils: Eldean, Lippincott, Milford, and Ockley

Taxonomic Class: Fine, mixed, superactive, mesic Aeric Endoaqualfs

Typical Pedon
Savona silt loam, 0 to 2 percent slopes, about 50 feet west of New Madison, in Harrison Township, Darke County, Ohio; 320 feet west and 740 feet north of the center of sec. 13, T. 10 N., R. 1 E.

Ap=0 to 7 inches; dark grayish brown (10YR 4/2) silt loam, pale brown (10YR 6/3) dry; weak fine subangular blocky structure; friable; common fine roots; 2 percent gravel; neutral; abrupt smooth boundary.

Bt1=7 to 10 inches; yellowish brown (10YR 5/4) silt loam; moderate medium subangular blocky structure; friable; few fine roots; common prominent yellowish brown (10YR 5/8) clay films on faces of peds; few distinct dark grayish brown (10YR 4/2) organic coatings on faces of peds; many (55%) medium distinct grayish brown (10YR 5/2) iron depletions on faces of peds; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation throughout; few fine distinct black (10YR 2/1) masses of manganese accumulation on faces of peds; 2 percent gravel; neutral; clear wavy boundary.

Bt2=10 to 15 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; firm; few fine roots; common prominent yellowish brown (10YR 5/8) clay films on faces of peds; many (55%) medium distinct grayish brown (10YR 5/2) iron depletions on faces of peds; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation throughout; few fine distinct black (10YR 2/1) masses of manganese accumulation on faces of peds; 2 percent gravel; neutral; clear wavy boundary.

Bt3=15 to 20 inches; yellowish brown (10YR 5/4) clay; moderate medium subangular blocky structure; firm; few fine roots; many faint gray (10YR 5/1) clay films on faces of peds; many (30%) medium distinct grayish brown (10YR 5/2) iron depletions on faces of peds; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation throughout; few fine distinct black (10YR 2/1) masses of manganese accumulation on faces of peds; 10 percent gravel; neutral; clear wavy boundary.

Bt4=20 to 29 inches; brown (10YR 5/3) very gravelly clay; moderate medium subangular blocky structure; firm; few very fine roots; many distinct gray (10YR 5/1) clay films on faces of peds; many (25%) medium faint grayish brown (10YR 5/2) iron depletions on faces of peds; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation on faces of peds; 38 percent gravel; neutral; clear wavy boundary.

BC=29 to 45 inches; brown (10YR 5/3) very gravelly loam; weak coarse subangular blocky structure; friable; few very fine roots; 35 percent sedimentary and 8 percent metamorphic rock fragments; slightly effervescent; moderately alkaline; diffuse wavy boundary.

C=45 to 80 inches; brown (10YR 5/3) very gravelly coarse sand; single grain; loose; 46 percent sedimentary and 4 percent metamorphic rock fragments; violently effervescent; moderately alkaline.

Range in Characteristics
Thickness of the solum: 30 to 55 inches
Depth to carbonates: 24 to 40 inches
Depth to sandy or sandy-skeletal material: 40 to 60 inches
Content of rock fragments: Ap horizon=0 to 5 percent; upper part of the Bt horizon=0 to 14 percent; lower part of the Bt horizon=15 to 40 percent; BC horizon=15 to 59 percent, C horizon=35 to 75 percent

Ap horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 1 to 3
Texture=silt loam

Bt or Btg horizon:
Color=hue of 10YR or 2.5Y, value of 4 to 6, chroma of 2 to 4
Texture=clay, clay loam, silt loam, or silty clay loam in the upper part, and gravelly or very gravelly

analogues of sandy clay loam, clay loam, clay, or loam in the lower part

BC or BCg horizon:
Color=hue of 10YR or 2.5Y, value of 4 to 6, chroma of 2 to 4
Texture=gravelly or very gravelly analogues of loam, sandy loam, coarse sandy loam, or silt loam

C or Cg horizon:
Color=hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 6
Texture=very gravelly or extremely gravelly analogues of loamy sand, sand, loamy coarse sand, or coarse sand, and commonly is stratified

Sloan Series

Depth class: Very deep
Drainage class: Very poorly drained
Parent material: Loamy alluvium over sandy alluvium
Landform: Flood plains
Slope: 0 to 1 percent
Adjacent soils: Eel and Medway

Taxonomic class: Fine-loamy, mixed, superactive, mesic Fluvaquentic Endoaquolls

Typical Pedon
Sloan silt loam, sandy substratum, 0 to 1 percent slopes, frequently flooded, about 5.3 miles north of New Paris, in Jefferson Township, Preble County, Ohio; about 251 feet south and 160 feet west of the northeast corner of sec. 5, T. 9 N., R. 1 E.

Ap=0 to 10 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine and medium granular structure; friable; common fine roots; neutral; abrupt smooth boundary.

Bg1=10 to 18 inches; dark gray (10YR 4/1) silty clay loam; weak medium and coarse subangular blocky structure; firm; few fine roots; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds and in root channels; many fine and medium prominent strong brown (7.5YR 4/6) masses of iron accumulation throughout; common fine faint black (10YR 2/1) masses of manganese accumulation throughout; neutral; abrupt wavy boundary.

Bg2=18 to 22 inches; dark gray (10YR 4/1) loam; weak medium and coarse subangular blocky structure; firm; few fine roots; common faint gray (10YR 5/1) iron depletions on faces of peds; many fine and medium prominent strong brown (7.5YR 4/6) masses of iron accumulation throughout; common fine faint black (10YR 2/1) masses of manganese accumulation throughout; 2 percent gravel; neutral; clear wavy boundary.

Bg3=22 to 27 inches; dark gray (10YR 4/1) silty clay loam; weak medium and coarse subangular blocky structure; firm; common fine prominent strong brown (7.5YR 4/6) masses of iron accumulation throughout; common fine faint black (10YR 2/1) masses of manganese accumulation throughout; 2 percent gravel; neutral; clear wavy boundary.

BCg=27 to 45 inches; very dark gray (10YR 3/1) clay loam; weak coarse subangular blocky structure; friable; common fine prominent strong brown (7.5YR 4/6) masses of iron accumulation throughout; few fine faint black (10YR 2/1) masses of manganese accumulation throughout; few prominent light gray (10YR 7/2) masses of calcium carbonate accumulation around gravel; 10 percent gravel; slightly effervescent; slightly alkaline; clear wavy boundary.

C1=45 to 60 inches; brown (10YR 4/3) gravelly sandy loam; massive; friable; common medium faint yellowish brown (10YR 5/4) and many medium prominent strong brown (7.5YR 5/6) masses of iron accumulation throughout; common distinct light gray (10YR 7/2) masses of calcium carbonate accumulation around gravel; 30 percent gravel; strongly effervescent; slightly alkaline; abrupt wavy boundary.

2C2=60 to 80 inches; brown (10YR 5/3) very gravelly loamy coarse sand; single grain; loose; 55 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics
Thickness of the solum: 20 to 60 inches
Thickness of the mollic epipedon: 10 to 24 inches
Depth to carbonates: 22 to 80 inches
Depth to sandy material: 60 inches or more
Content of gravel: Ap and Bg horizons=0 to 5 percent; BCg and C horizons=0 to 34 percent; 2C horizon=0 to 55 percent

Ap horizon:
Color=hue of 10YR or 2.5Y, value of 2, 2.5 or 3, chroma of 1 or 2
Texture=silt loam

Bg horizon:
Color=hue of 10YR to 5Y, or is neutral, value of 3 to 5, chroma of 0 to 2
Texture=silty clay loam, clay loam, silt loam, or loam

BCg or BC horizon:

Color=hue of 10YR to 5Y, or is neutral, value of 3 to 6, chroma of 0 to 4
Texture=silty clay loam, clay loam, silt loam, or loam

Cg or C horizon:
Color=hue of 10YR to 5Y, value of 3 to 6, chroma of 1 to 4
Texture=silty clay loam, clay loam, loam, or sandy loam, or their gravelly analogues

2C or 2Cg horizon:
Color=hue of 10YR to 5Y, value of 3 to 6, chroma of 1 to 4
Texture=loamy sand, loamy coarse sand, or sand, or their gravelly or very gravelly analogues

Stonelick Series

Depth class: Very deep
Drainage class: Well drained
Parent material: Calcareous, loamy and sandy alluvium over gravelly alluvium
Landform: Flood plains
Slope: 0 to 1 percent
Adjacent soils: Rossburg and Eel

Taxonomic class: Coarse-loamy, mixed, superactive, calcareous, mesic Typic Udifluvents

Typical Pedon
Stonelick loam, gravelly substratum, 0 to 1 percent slopes, frequently flooded, about 1.7 miles east of Gratis, in Gratis Township, Preble County, Ohio; about 1,300 feet south and 1,800 feet east of the northwest corner of sec. 2, T. 4 N., R. 3 E.

Ap=0 to 10 inches; brown (10YR 4/3) loam, pale brown (10YR 6/3) dry; weak fine and medium granular structure; friable; common fine roots; few faint very dark grayish brown (10YR 3/2) organic coatings throughout; slightly effervescent; moderately alkaline; clear smooth boundary.

C1=10 to 18 inches; brown (10YR 4/3) fine sandy loam; massive; friable; few fine roots; slightly effervescent; moderately alkaline; clear wavy boundary.

C2=18 to 26 inches; brown (10YR 4/3) fine sandy loam; massive; friable; few fine roots; 2 percent gravel; violently effervescent; moderately alkaline; clear smooth boundary.

C3=26 to 30 inches; brown (10YR 5/3) loamy sand; single grain; loose; 5 percent gravel; violently effervescent; moderately alkaline; clear wavy boundary.

2C4=30 to 80 inches; brown (10YR 5/3) very gravelly loamy sand; single grain; loose; 50 percent gravel, 10 percent cobbles; violently effervescent; moderately alkaline.

Range in Characteristics
Depth to carbonates: typically have carbonates throughout the profile
Depth to gravelly material: 30 inches or more
Content of rock fragments: Ap horizon=0 to 5 percent; C horizon=0 to 14 percent; 2C horizon=15 to 50 percent

Ap horizon:
Color=hue of 10YR, value of 3 to 5, chroma of 2 to 4
Texture=loam

C horizon:
Color=hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 2 to 4
Texture=stratified with loam, sandy loam, fine sandy loam, or loamy sand

2C horizon:
Color=hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 2 to 4
Texture= gravelly or very gravelly analogues of loamy sand, loamy coarse sand, or sand

Sugarvalley Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Parent material: Loess and the underlying water modified till
Landform: Flats on the Wisconsinan ground moraines
Position on the landform: Summits
Slope: 0 to 2 percent
Adjacent soils: Cyclone, Fincastle, Morningsun, and Xenia

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

Typical Pedon
Sugarvalley silt loam, 0 to 2 percent slopes, about 3.2 miles north of Fairhaven, in Dixon Township, Preble County, Ohio; about 600 feet west and 400 feet north of the southeast corner of sec. 20, T. 7 N., R. 1 E.

Ap=0 to 10 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine and medium subangular blocky structure; friable; many fine and very fine roots throughout; common fine prominent strong brown (7.5YR 4/6) masses of iron accumulation throughout; common fine faint dark brown (10YR 3/3) masses of iron and manganese accumulation throughout; very strongly acid; abrupt smooth boundary.

BE=10 to 16 inches; brown (10YR 5/3) silt loam; weak fine and medium subangular blocky structure; friable; many fine and very fine roots throughout; few distinct dark grayish brown (10YR 4/2) organic coatings on faces of peds; common medium faint grayish brown (10YR 5/2) iron depletions in the matrix; common fine prominent strong brown (7.5YR 5/6) masses of iron accumulation throughout; common fine faint very dark grayish brown (10YR 3/2) masses of iron and manganese accumulation throughout; strongly acid; clear wavy boundary.

Bt1=16 to 30 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; firm; many fine roots throughout; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; common fine and medium distinct strong brown (7.5YR 5/6) masses of iron accumulation throughout; common fine and medium distinct very dark gray (10YR 3/1) masses of iron and manganese accumulation throughout; common coarse distinct very dark gray (10YR 3/1) iron and manganese concretions throughout; moderately acid; clear wavy boundary.

Bt2=30 to 41 inches; yellowish brown (10YR 5/6) silt loam; weak coarse prismatic structure parting to moderate medium subangular blocky; firm; many fine roots throughout; common distinct gray (10YR 5/1) clay films on faces of peds; common medium prominent grayish brown (10YR 5/2) iron depletions in the matrix; many medium distinct strong brown (7.5YR 5/8) masses of iron accumulation throughout; common fine and medium prominent very dark gray (10YR 3/1) masses of iron and manganese accumulation throughout; neutral; clear smooth boundary.

2Bt3=41 to 51 inches; yellowish brown (10YR 5/6) silt loam; weak coarse prismatic structure parting to moderate medium subangular blocky; firm; many fine roots throughout; common distinct gray (10YR 5/1) clay films on faces of peds; common medium prominent grayish brown (10YR 5/2) iron depletions in the matrix; many medium distinct strong brown (7.5YR 5/8) masses of iron accumulation throughout; common fine prominent very dark gray (10YR 3/1) masses of iron and manganese accumulation throughout; about 28 percent sand; 8 percent rock fragments; slightly alkaline; clear smooth boundary.

2BC=51 to 61 inches; yellowish brown (10YR 5/4) gravelly loam; weak coarse subangular blocky structure; firm; common fine roots between peds; few distinct yellowish brown (10YR 5/4) clay films along root channels and on vertical faces of peds; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; few medium prominent strong brown (7.5YR 5/8) masses of iron accumulation throughout; few fine distinct very dark gray (10YR 3/1) masses of iron and manganese accumulation throughout; 5 percent subrounded shale fragments and 15 percent subrounded limestone fragments; strongly effervescent; slightly alkaline; gradual wavy boundary.

2C=61 to 80 inches; brown (10YR 5/3) gravelly sandy loam; massive; friable; few fine roots throughout to 68 inches; common medium faint grayish brown (10YR 5/2) iron depletions throughout; common medium prominent strong brown (7.5YR 5/8) masses of iron accumulation throughout; pockets of grayish brown (2.5Y 5/2) and gray (10YR 5/1) clay loam with common coarse prominent yellowish brown (10YR 5/8) masses of iron accumulation throughout the pockets; few fine distinct very dark gray (10YR 3/1) masses of iron and manganese accumulation throughout; 5 percent subrounded limestone fragments and 10 percent subrounded granite fragments; violently effervescent; slightly alkaline.

Range in Characteristics

Thickness of the solum: 35 to 75 inches
Depth to carbonates: 40 to 60 inches
Thickness of the loess mantle: 30 to 50 inches
Content of rock fragments: Ap and Bt horizons=0 to 2 percent; 2Bt horizon=0 to 10 percent; 2BC and 2C horizons=5 to 25 percent

Ap horizon:
Color=hue of 10YR or 2.5Y, value of 4, chroma of 2 or 3
Texture=silt loam

E horizon where present:
Color=hue of 10YR or 2.5Y, value of 5, chroma of 2 or 3
Texture=silt loam

BE horizon where present:
Color=hue of 10YR or 2.5Y, value of 4 or 5, chroma of 3 or 4
Texture=silt loam

Bt horizon:
Color=hue of 10YR or 2.5Y, value of 4 or 5, chroma of 2 to 6
Texture=silty clay loam or silt loam

2Bt horizon where present:
Color=hue of 10YR, value of 4 or 5, chroma of 2 to 6
Texture=silt loam, loam, or clay loam

2BC horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 3 to 6
Texture=loam, clay loam, or sandy loam, or their gravelly analogues, with strata of silt loam in some pedons

2C horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 3 or 4
Texture=loam or sandy loam, or their gravelly analogues, with pockets or strata of silt loam, clay loam, or loamy sand in some pedons

Thackery Series

Depth class: Very deep
Drainage class: Moderately well drained
Parent material: Loamy material and the underlying calcareous outwash
Landform: Stream terraces
Position on the landform: Treads
Slope: 0 to 6 percent
Adjacent soils: Eldean, Ockley, and Westland

Taxonomic class: Fine-loamy, mixed, active, mesic Aquic Hapludalfs

Typical Pedon
Thackery silt loam, 0 to 2 percent slopes, about 2.5 miles west-northwest of Morningsun, in Israel Township, Preble County, Ohio; about 620 feet west and 152 feet north of the southeast corner of sec. 17, T. 6 N., R. 1 E.

Ap1=0 to 5 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine granular structure; friable; many fine roots; moderately acid; abrupt smooth boundary.

Ap2=5 to 12 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak medium and coarse subangular blocky structure; friable; common fine roots; moderately acid; abrupt smooth boundary.

Bt1=12 to 21 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine and medium subangular blocky structure; firm; common fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; 2 percent gravel; slightly acid; clear smooth boundary.

2Bt2=21 to 26 inches; dark yellowish brown (10YR 4/4) clay loam; moderate medium prismatic structure parting to moderate coarse subangular blocky; firm; common fine roots; many distinct dark grayish brown (10YR 4/2) and few distinct very dark grayish brown (10YR 3/2) clay films on faces of peds; few fine prominent yellowish brown (10YR 5/8) masses of iron accumulation throughout; common fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 3 percent gravel; neutral; clear smooth boundary.

2Bt3=26 to 38 inches; dark yellowish brown (10YR 4/4) clay loam; moderate coarse subangular blocky structure; firm; few fine roots; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; common fine distinct dark yellowish brown (10YR 4/6) masses of iron accumulation throughout; common fine and medium distinct black (10YR 2/1) masses of manganese accumulation throughout; 7 percent gravel; neutral; clear wavy boundary.

2Bt4=38 to 44 inches; yellowish brown (10YR 5/4) clay loam; weak coarse subangular blocky structure; friable; few fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; few fine distinct dark yellowish brown (10YR 4/6) and common fine and medium prominent yellowish brown (10YR 5/8) masses of iron accumulation throughout; common fine and medium distinct white (10YR 8/1) masses of calcium carbonate accumulation throughout; 10 percent gravel; slightly effervescent; slightly alkaline; clear wavy boundary.

2BC=44 to 54 inches; brown (10YR 5/3) sandy clay loam; weak medium and coarse subangular blocky structure; friable; common fine faint grayish brown (10YR 5/2) iron depletions in the matrix; few fine and medium faint dark yellowish brown (10YR 4/4) and common fine and medium distinct dark yellowish brown (10YR 4/6) masses of iron accumulation throughout; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 10 percent gravel; slightly effervescent; slightly alkaline; gradual smooth boundary.

2C1=54 to 63 inches; brown (10YR 5/3) gravelly loamy coarse sand; single grain; loose; 20 percent

gravel; strongly effervescent; moderately alkaline; gradual wavy boundary.

2C2=63 to 80 inches; brown (10YR 5/3) very gravelly loamy coarse sand; single grain; loose; 50 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics
Thickness of the solum: 35 to 70 inches
Depth to carbonates: 32 to 55 inches
Thickness of the loamy mantle: 0 to 25 inches
Content of rock fragments: Ap and Bt horizons=0 to 2 percent; 2Bt horizon=2 to 25 percent; 2BC horizon=10 to 70 percent; 2C horizon=15 to 70 percent

Ap horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 2 or 3
Texture=silt loam

Bt horizon:
Color=hue of 7.5YR or 10YR, value of 4 or 5, chroma of 3 to 6
Texture=silt loam or silty clay loam

2Bt or 2Btg horizon:
Color=hue of 7.5YR or 10YR, value of 4 or 5, chroma of 2 to 6
Texture=clay loam, loam, or sandy clay loam, or their gravelly analogues

2BC or 2BCg horizon:
Color=hue of 7.5YR or 10YR, value of 4 or 5, chroma of 2 to 4
Texture=loam, sandy clay loam, or sandy loam, or their gravelly to extremely gravelly analogues

2C horizon:
Color=hue of 10YR, value of 5, chroma of 3
Texture= gravelly to extremely gravelly analogues of loamy sand or loamy coarse sand

The Thackery soils in the ThB map unit are a taxadjunct to the Thackery series because they are deeper to redoximorphic features than defined for the series. They classify as fine-loamy, mixed, active, mesic Oxyaquic Hapludalfs. This difference, however, does not significantly affect use and management of the soils.

Warsaw Series

Depth class: Very deep
Drainage class: Well drained
Parent material: Loamy material and the underlying gravelly outwash
Landform: Wisconsinan outwash terraces
Position on the landform: Treads
Slope: 0 to 2 percent
Adjacent soils: Eldean, Fox, Ockley, and Thackery

Taxonomic class: Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Typic Argiudolls

Typical Pedon
Warsaw loam, 0 to 2 percent slopes, about 1 mile south of West Alexandria, in Lanier Township, Preble County, Ohio; about 1,798 feet north and 400 feet east of the northeast corner of sec. 10, T. 9 N., R. 2 E.

Ap=0 to 12 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; weak medium and fine granular structure; friable; common fine and very fine roots; common faint very dark gray (10YR 3/1) organic coatings throughout; 5 percent gravel; slightly acid; abrupt smooth boundary.

Bt1=12 to 21 inches; dark yellowish brown (10YR 4/4) clay loam; moderate medium subangular blocky structure; firm; few fine and very fine roots; common faint brown (7.5YR 4/4) clay films on faces of peds; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; 5 percent gravel; moderately acid; clear wavy boundary.

2Bt2=21 to 30 inches; brown (7.5YR 4/4) gravelly clay loam; moderate medium subangular blocky structure; firm; few fine and very fine roots; common distinct brown (7.5YR 4/4) clay films on faces of peds; few prominent very dark gray (10YR 3/1) organic coatings on faces of peds; 15 percent gravel; neutral; clear wavy boundary.

2C1=30 to 42 inches; brown (10YR 5/3) gravelly coarse sand; single grain; loose; 15 percent gravel; slightly effervescent; slightly alkaline; clear wavy boundary.

2C2=42 to 80 inches; brown (10YR 5/3) extremely gravelly loamy coarse sand; single grain; loose; 70 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics
Thickness of the solum: 24 to 40 inches
Thickness of the mollic epipedon: 10 to 22 inches
Depth to carbonates: 20 to 36 inches
Content of rock fragments: Ap horizon=0 to 14 percent; Bt horizon=0 to 14 percent; 2Bt

horizon=15 to 25 percent; 2C horizon=15 to 78 percent

Ap horizon:
Color=hue of 7.5YR or 10YR, value of 2, 2.5 or 3, chroma of 1 to 3
Texture=loam

Bt horizon:
Color=hue of 7.5YR or 10YR, value of 3 or 4, chroma of 2 to 4
Texture=silty clay loam, loam, or clay loam

2Bt horizon:
Color=hue of 7.5YR or 10YR, value of 2 to 4, chroma of 2 to 4
Texture=gravelly clay loam or gravelly sandy clay loam

2C horizon:
Color=hue of 7.5YR or 10YR, value of 5 to 7, chroma of 2 to 4
Texture=gravelly to extremely gravelly analogues of coarse sand, sand, loamy sand, or loamy coarse sand, and is commonly stratified

Westland Series

Depth class: Very deep
Drainage class: Very poorly drained
Parent material: Loamy material over calcareous, stratified gravelly and sandy outwash
Landform: Depressions on Wisconsinan outwash terraces
Position on the landform: Treads
Slope: 0 to 2 percent
Adjacent soils: Thackery, Ockley, and Sloan

Taxonomic class: Fine-loamy, mixed, superactive, mesic Typic Argiaquolls

Typical Pedon
Westland silt loam, 0 to 2 percent slopes, about 1.5 miles southeast of New Westville, in Jackson Township, Preble County, Ohio; about 590 feet north and 1,500 feet west of the southeast corner of sec. 4, T. 8 N., R. 1 E.

Ap=0 to 12 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine and medium granular structure; friable; few fine roots; few fine faint black (10YR 2/1) masses of manganese accumulation throughout; 2 percent gravel; neutral; abrupt smooth boundary.

Btg1=12 to 20 inches; dark gray (10YR 4/1) silty clay loam; moderate medium subangular blocky structure; firm; few very fine roots; many faint dark gray (10YR 4/1) clay films on faces of peds; few faint very dark gray (10YR 3/1) organic coatings on faces of peds; many medium faint dark grayish brown (10YR 4/2) iron depletions in the matrix; common medium prominent light olive brown (2.5Y 5/4) masses of iron accumulation throughout; many medium prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; few fine faint black (10YR 2/1) masses of manganese accumulation throughout; 2 percent gravel; neutral; gradual wavy boundary.

Figure 29. Profile of Westland series. The scale is in inches.

Btg2=20 to 28 inches; gray (10YR 5/1) clay loam; moderate medium subangular blocky structure; firm; few very fine roots; many faint dark gray (10YR 4/1) clay films on faces of peds; few faint very dark gray (10YR 3/1) organic coatings on faces of peds; many medium faint light brownish gray (10YR 6/2) iron depletions in the matrix; common medium prominent light olive brown (2.5Y 5/4) masses of iron accumulation throughout; many medium prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; few fine distinct black (10YR 2/1) masses of manganese accumulation

throughout; 10 percent gravel; neutral; clear wavy boundary.

2Btg3=28 to 37 inches; grayish brown (2.5Y 5/2) gravelly clay loam; moderate medium subangular blocky structure; firm; many prominent dark gray (10YR 4/1) clay films on faces of peds; many medium faint light brownish gray (10YR 6/2) iron depletions in the matrix; common medium distinct light olive brown (2.5Y 5/4) masses of iron accumulation throughout; many medium prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; few fine prominent black (10YR 2/1) masses of manganese accumulation throughout; common distinct light gray (10YR 7/2) masses of secondary carbonates throughout; 15 percent gravel; slightly effervescent around weathered limestone gravel; neutral; clear wavy boundary.

2Btg4=37 to 43 inches; dark gray (10YR 4/1) gravelly clay loam; moderate medium and fine subangular blocky structure; firm; many faint dark gray (10YR 4/1) clay films on faces of peds; many medium faint grayish brown (2.5Y 5/2) iron depletions in the matrix; common medium prominent light olive brown (2.5Y 5/4) masses of iron accumulation throughout; many medium prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; few fine faint black (10YR 2/1) masses of manganese accumulation throughout; common distinct light gray (10YR 7/2) masses of secondary carbonates throughout; 15 percent gravel; slightly effervescent around weathered limestone gravel; neutral; clear wavy boundary.

2BCg=43 to 51 inches; grayish brown (10YR 5/2) gravelly sandy loam; weak coarse subangular blocky structure; friable; many medium distinct light olive brown (2.5Y 5/4) masses of iron accumulation in the matrix; 20 percent gravel; slightly effervescent; slightly alkaline; abrupt smooth boundary.

2C=51 to 80 inches; brown (10YR 5/3) extremely gravelly loamy coarse sand; single grain; loose; 65 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics
Thickness of the solum: 40 to 60 inches
Thickness of the mollic epipedon: 10 to 20 inches
Depth to carbonates: 40 to 60 inches
Content of rock fragments: Ap horizon=0 to 5 percent; Btg horizon=0 to 5 percent in the upper part and 1 to 15 percent in the lower part; 2Btg and 2BC horizons=5 to 40 percent; 2C or 2Cg horizon=20 to 65 percent

Ap horizon:
Color=hue of 10YR or 2.5Y, or is neutral, value of 2, 2.5 or 3, chroma of 0 to 3
Texture=silt loam

Btg horizon:
Color=hue of 10YR or 2.5Y, or is neutral, value of 3 to 6, chroma of 0 to 2
Texture=loam, clay loam or silty clay loam in the upper part, and loam, clay loam, or sandy clay loam, or their gravelly analogues in the lower part

2Btg horizon:
Color=hue of 10YR to 5Y, or is neutral, value of 3 to 6, chroma of 0 to 2
Texture=loam, clay loam, sandy loam or sandy clay loam, or their gravelly or very gravelly analogues

2BCg horizon:
Color=hue of 10YR or 2.5Y, value of 4 to 6, chroma of 0 to 2
Texture=loam, clay loam, sandy loam or sandy clay loam, or their gravelly or very gravelly analogues

2C or 2Cg horizon:
Color=hue of 10YR, 2.5Y or is neutral, value of 3 to 7, chroma of 0 to 4
Texture=gravelly to extremely gravelly analogues of coarse sand or loamy coarse sand and commonly is stratified

Wynn Series

Depth class: Moderately deep
Drainage class: Well drained
Parent material: A thin layer of loess and the underlying till over limestone and shale
Landform: Wisconsinan till plains
Position on the landform: Summits, shoulders, footslopes and backslopes
Slope: 2 to 50 percent
Adjacent soils: Dana, Plattville, Russell, and Xenia

Taxonomic class: Fine, mixed, superactive, mesic Typic Hapludalfs

Typical Pedon
Wynn silt loam, 2 to 6 percent slopes, eroded, about 2.5 miles southeast of Morningsun, in Somers Township, Preble County, Ohio; about 1,700 feet west and 1,375 feet south of the northeast corner of sec. 31, T. 6 N., R. 2 E.

Ap=0 to 8 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine and medium subangular blocky structure; friable; many fine and very fine and few medium roots; many distinct dark grayish brown (10YR 4/2) organic coatings on faces of peds; neutral; abrupt smooth boundary.

Bt1=8 to 15 inches; yellowish brown (10YR 5/4) silty clay loam; weak fine and medium subangular blocky structure; friable; common fine and very fine and few medium roots; many distinct brown (10YR 4/3) clay films on faces of peds; common distinct dark grayish brown (10YR 4/2) organic coatings in root channels and pores; common faint brown (10YR 5/3) clay depletions on faces of peds; few fine distinct black (10YR 2/1) masses of manganese accumulation in the matrix; slightly acid; clear wavy boundary.

Bt2=15 to 23 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; firm; few fine and very fine roots; many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; common faint brown (10YR 5/3) clay depletions on faces of peds; few fine prominent yellowish red (5YR 4/6) masses of iron accumulation in the matrix; common fine distinct black (10YR 2/1) masses of manganese accumulation in the matrix; slightly acid; clear wavy boundary.

2Bt3=23 to 28 inches; brown (7.5YR 4/4) silty clay loam; moderate medium and coarse subangular blocky structure; firm; few fine and very fine roots; many distinct dark reddish brown (5YR 3/2) clay films on faces of peds; common fine prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; common fine and medium prominent black (10YR 2/1) masses of manganese accumulation in the matrix; 2 percent limestone, igneous, and shale fragments; neutral; clear wavy boundary.

3Cr=28 to 30 inches; interbedded calcareous clay shale and limestone bedrock.

Range in Characteristics
Thickness of the solum: 20 to 40 inches
Depth to bedrock: 20 to 40 inches
Thickness of the loess mantle: 10 to 23 inches, but is absent in some eroded pedons
Content of rock fragments: Ap and Bt horizons=0 percent; 2Bt or 2BC horizon=2 to 14 percent

Ap horizon:
Color=hue of 10YR, value of 4, chroma of 2 or 3
Texture=silt loam

Bt horizon:
Color=hue of 7.5YR or 10YR, value of 3 to 5, chroma of 3 or 4
Texture=silty clay loam

2Bt or 2BC horizon:
Color=hue of 5YR to 10YR, value of 3 to 5, chroma of 3 to 6
Texture=silty clay loam, clay loam, clay, or silty clay

3Cr horizon:
Interbedded calcareous clay shale and limestone bedrock

Xenia Series

Depth class: Very deep
Drainage class: Moderately well drained
Parent material: Loess and the underlying till; in the bedrock substratum phase, loess and the underlying till over limestone and shale
Landform: Flats and slight rises on the Wisconsinan till plains and ground moraines
Positions on the landform: Summits and shoulders
Slope: 0 to 6 percent
Adjacent soils: Cyclone, Fincastle, Morningsun, Sugarvalley, and Russell

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

Typical Pedon
Xenia silt loam, 0 to 2 percent slopes, about 11.4 miles west and 7.6 miles south of Eaton, in Dixon Township, Preble County, Ohio; about 500 feet south and 500 feet east of the northwest corner of sec. 19, T. 6 N., R. 1 E.

Ap=0 to 9 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; moderate medium granular structure; friable; common fine roots; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; moderately acid; abrupt smooth boundary.

Bt1=9 to 14 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine subangular blocky structure; friable; common fine roots; common distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; few fine distinct light brownish gray (10YR 6/2) iron depletions in the matrix; few distinct brown (10YR 5/3) clay depletions on faces of peds;

few fine distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; strongly acid; clear smooth boundary.

Bt2=14 to 26 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; firm; common fine roots; common distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; few fine distinct light brownish gray (10YR 6/2) iron depletions in the matrix; common distinct pale brown (10YR 6/3) clay depletions on faces of peds; common medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine distinct black (10YR 2/1) masses of manganese accumulation throughout; very strongly acid; clear wavy boundary.

Bt3=26 to 38 inches; yellowish brown (10YR 5/4) silt loam; moderate medium subangular blocky structure; firm; few fine roots; common distinct yellowish brown (10YR 5/6) clay films on faces of peds; few fine distinct light brownish gray (10YR 6/2) iron depletions in the matrix; common medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; very strongly acid; clear wavy boundary.

2BC=38 to 48 inches; yellowish brown (10YR 5/4) clay loam; weak coarse subangular blocky structure; firm; few distinct yellowish brown (10YR 5/6) clay films on faces of peds; common medium distinct light brownish gray (10YR 6/2) iron depletions in the matrix; common medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 3 percent limestone and 2 percent igneous rock fragments; slightly effervescent; slightly alkaline; clear wavy boundary.

2Cd=48 to 80 inches; yellowish brown (10YR 5/4) loam with thin strata of silt loam; massive; firm; common medium distinct light brownish gray (10YR 6/2) iron depletions in the matrix; common medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 5 percent limestone and 5 percent igneous fragments; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 40 to 60 inches
Depth to carbonates: 35 to 60 inches
Depth to bedrock: greater than 80 inches; in the bedrock substratum phase, it is 60 to 80 inches
Thickness of the loess mantle: 22 to 40 inches
Content of rock fragments: Ap and Bt horizons=0 to 1 percent;
2Bt, 2BC and 2Cd horizons=2 to 10 percent

Ap horizon:
Color=hue of 10YR, value of 4, chroma of 2 or 3
Texture=silt loam

Bt horizon:
Color=hue of 10YR, value of 4 to 6, chroma of 3 to 6
Texture=silt loam and silty clay loam

2Bt horizon, where present:
Color=hue of 10YR, value of 4 or 5, chroma of 3 to 6
Texture=clay loam or loam

2BC horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 3 or 4
Texture=clay loam or loam

2Cd horizon:
bedrock

Color=hue of 10YR, value of 5, chroma of 3 or 4
Texture=loam; some pedons have strata or pockets of silt loam in the upper part; in the bedrock substratum phase, the range is loam or flaggy loam

3Cr horizon (in the bedrock substratum phase):
weathered shale and limestone

Formation of the Soils

This section relates the factors of soil formation to the soils in Preble County and explains the processes of soil formation.

Factors of Soil Formation

A soil is a three-dimensional natural body consisting of mineral and organic material that can support plant growth. The nature of any soil at a given site is the result of the interaction of five general factors—parent material, climate, plants and animals, relief, and time. Climate and plants and animals have an effect on parent material that is modified by relief over time. Theoretically, if all these factors were identical at different sites, the soils at these sites would be identical. Differences among the soils are caused by variations in one or more of these factors.

Parent Material

Parent material is the raw material acted on by the soil-forming processes. It largely determines soil texture, which, in turn, affects other properties, such as natural soil drainage and permeability. The physical and chemical composition of parent material has an important effect on the kind of soil that forms.

The soils in Preble County formed in many different kinds of parent material. Many of the soils formed in material deposited by the glaciers that covered much of the survey area thousands of years ago or by the meltwater from these glaciers. Other soils formed in loess, which is silty windblown material, or in alluvium, which is material recently deposited by streams.

Till is material that was deposited directly by glacial ice with little or no water action. It typically has particles that vary in size, including sand, silt, clay, and some pebbles, cobblestones, and larger rock fragments. The smaller rock fragments generally are angular. The composition of the till depends on the nature of the area over which the ice passed before the till was deposited. Some of the material was transported great distances by the ice, but most of the till was of local origin. Most of the till in Preble County was deposited during the latest major glaciation, the Wisconsinan Glaciation. It is massive and compact, and generally is loam in texture.

The till plains in Preble County are ground moraines, kames, and end moraines. The ground moraines are typically broad landforms that are nearly level to gently sloping. The kames and end moraines are more pronounced features on the landscape and range from nearly level to steep. Celina, Crosby, Fincastle, Kendallville, Losantville, Miami, Miamian, and Xenia soils are some of the soils on till plains in Preble County that formed in till.

Outwash deposits, laid down by moving water, and lacustrine deposits, laid down in still water, are two general kinds of meltwater deposits. The size of the particles that can be carried suspended in water depends on the speed of the moving water. When the water slows to a given speed, the suspended particles that are larger than a given size will settle in the water. Water slows wherever a stream loses grade or flows into a body of still water. At that time, the coarser sand and gravel particles settle near the mouth of the stream and the silt and fine clay particles are carried farther into the lake, where they slowly settle.

The soils that formed in outwash deposits are of minimum extent in Preble County. They formed in deposits laid down as surging meltwater poured from the glacier, depositing sand and gravel as outwash terraces, outwash plains, and kames. The meltwater washed away the smaller particles of silt and clay, leaving behind sand and gravel. The soils that formed in outwash generally are permeable. Outwash of Wisconsinan age is deposited in Preble County.

The amount of natural lime and the proportion of shale, sandstone, limestone, and igneous pebbles in the outwash are determined by the source of the outwash. The Wisconsinan outwash deposits along the major terraces in Preble County were derived from limestone-influenced glacial drift. Eldean and Ockley soils formed in limy outwash of Wisconsinan age. The outwash deposits generally have a mantle of loess. The thickness of the loess on the outwash terraces varies inversely with the slope.

Soils that formed in lacustrine deposits are of relatively minor extent throughout Preble County, although they are locally extensive in places. They formed in deposits laid down in scattered old glacial or post-glacial lakes. Milford soils are formed in these silty deposits.

Loess is wind-deposited, silty soil material. Soils that formed in loess are of major extent in Preble County, although they mainly occur in the western and southern parts (78). The loess was deposited as the outwash terraces were forming. Strong winds swept across these open, level terraces, picked up silt particles, and later deposited them, commonly on landforms at higher elevations. Morningsun and

Sugarvalley soils formed mainly in loess that was deposited on Wisconsinan ground moraines.

The southern part of the county was glaciated but the glacier had less of an influence on soil morphology, especially on the steeper slopes. In areas on the Richmond formation, Wynn soils formed in a thin layer of loess and the underlying till over limestone and shale.

Recent alluvium is soil material deposited by floodwater along streams. The texture of the soil material varies, depending on the speed of the floodwater, the duration of flooding, and the distance from the streambank. Soils that formed in recent alluvium can be highly stratified. The soil horizons are weakly expressed because the soil-forming processes are interrupted with each new deposition. The source of the alluvium generally is material eroded from other soils farther upstream in the watershed. Eel, Sloan, and Stonelick soils formed in slightly acid to calcareous recent alluvium derived from soils that formed in limy Wisconsinan till and outwash.

Climate

The climate in Preble County has significantly affected the soil-forming processes. Climatic factors, such as precipitation and temperature, have influenced the existing plant and animal communities and the physical and chemical weathering of the parent material.

During the colder glacial epoch, the advancing glaciers spread over the glaciated part of the county and buried the boreal forest and the underlying soils. The cold temperatures in the soil reduced the rate of chemical reactions in the existing soils and in the raw parent material. Increased frost action, resulting from a periglacial climate, caused frost churning in some soils. Strong winds swept across the recently deposited glacial parent material, which was largely devoid of vegetation, and carried away large amounts of silt-sized particles, which were later deposited as loess. When the glacial ice retreated and the climate gradually warmed, deciduous forests eventually succeeded the boreal vegetation.

The county currently has a humid, temperate climate, which has persisted for thousands of years. In this climatic environment, physical and chemical weathering of the parent material can occur along with the accumulation of organic matter, the decomposition of minerals, the formation and translocation of clay, the leaching of soluble compounds, and alternating periods of freezing and thawing.

The microclimate in a given area can affect soil formation. Cyclone and Kokomo soils, which are in depressional or low lying areas, receive runoff from the higher adjacent slopes. The runoff creates a wet microclimate that results in prolonged saturation, the reduction of iron, and a gray subsoil. Sloping soils, such as Miamian soils, formed under a drier microclimate because of runoff. This better external drainage results in better aeration, the oxidation of iron, and a yellowish brown subsoil. Through its effect on the amount of sunlight and heat energy reaching the soil, the trees that grow on the soil, and the accumulation of organic matter in the soil, aspect also affects the microclimate.

Living Organisms

The vegetation under which a soil forms influences soil properties, such as color, structure, reaction, and content and distribution of organic matter. Vegetation extracts water from the soil, recycles nutrients, and adds organic matter to the soil. Gases derived from root respiration combine with water to form acids that influence the weathering of minerals. Because of a lower content of organic matter, soils that formed under forest vegetation are generally lighter colored than those that formed under grasses.

At the time Preble County was settled, the native vegetation consisted mainly of hardwood forests. Red oak, white oak, sugar maple, and American beech commonly grew on the better drained soils on the Wisconsinan till plains. Pin oak, shagbark hickory, red maple, American elm, and white ash were common on the wetter soils on these till plains. Water-tolerant reeds and sedges, willow, tamarack, and alder grew in scattered small fens or marshes.

Bacteria, fungi, and many other micro-organisms decompose organic matter and release nutrients to growing plants. They influence the formation of peds. Soil properties, such as drainage, temperature, and reaction, influence the type of micro-organisms that live in the soil. Fungi are generally more active in the more acid soils, while bacteria are more active in the less acid soils.

Earthworms, insects, and small burrowing animals mix the soil and create small channels that influence soil aeration and the percolation of water. Earthworms help to incorporate crop residue or other organic matter into the soil. The organic material improves tilth. In areas that are well populated with earthworms, the leaf litter that accumulates on the soil in the fall is generally incorporated into the soil by the following spring. If the earthworm population is low, part of the leaf fall can remain on the surface of the soil for several years.

Human activities have significantly influenced soil formation. Native forests have been cleared and developed for farming and other uses. Cultivation has accelerated erosion on sloping soils, wet soils have been drained, and manure, lime, chemical

fertilizer, and pesticides have been applied in cultivated areas. Cultivation has affected soil structure and compaction and lowered the content of organic matter. The development of land for urban uses or for mining has significantly influenced the soils in some areas.

Relief

Relief influences soil formation mainly through its effect on runoff and erosion. To a lesser extent, it also influences soil temperature, the plant cover, depth to the water table, and the accumulation and removal of organic matter.

Because it causes differences in external soil drainage, relief can differentiate soils that formed in the same kind of parent material. Water that runs off the more sloping soils can collect in depressions or swales. Kokomo and Miamian soils both formed in loamy till. The gently sloping to very steep Miamian soils on knolls and side slopes are well drained. They are in areas where external drainage is good. The nearly level Kokomo soils are very poorly drained. They are in swales or depressions that receive runoff from the higher adjacent soils, such as Miamian soils.

Relief varies very little in Preble County. On the ground moraines, the soils generally are nearly level to gently sloping. Relief becomes more pronounced and dissected on the end moraines as well as near the Four Mile Creek, Seven Mile Creek, Whitewater River, and Twin Creek watersheds.

Time

The length of time that the parent material has been exposed to soil-forming processes influences the nature of the soil that forms. The youngest soils in Preble County, such as Eel, Medway, Sloan, and Stonelick soils, formed in recent alluvium. These soils can be stratified and have weakly expressed horizons because the soil-forming processes are interrupted with each new deposition.

Glaciers advanced over all of Preble County during the Wisconsinan Glaciation. Glacial deposits of Wisconsinan age are geologically young, yet enough time has elapsed for the initially raw parent material to weather into soils that have distinct horizons. In most of the soils, including Celina, Crosby, and Miamian soils, carbonates have been leached to a depth of about 2 to 3 feet, clay has been translocated from the A horizon to the B horizon, and organic matter has accumulated in the A horizon.

Processes of Soil Formation

Soil forms through complex processes that are grouped into four general categories. These are additions, removals, transfers, and transformations. These processes affect soil formation, although in differing degrees.

The accumulation of organic matter in the A horizon of the mineral soils in Preble County is an example of an addition. This accumulation is the main reason for the dark color of the A horizon. The color of the raw parent material is uniform with increasing depth.

The leaching of lime from the upper 2 to 3 feet in many of the soils in Preble County that formed in till is an example of a removal. The parent material of these soils was initially limy, but the lime has been leached from the upper part of the profile by percolating water.

The translocation of clay from the A horizon to the B horizon in many soils on uplands in the county is an example of a transfer. The A horizon or an E horizon is a zone of eluviation, or loss. The B horizon is a zone of illuviation, or gain. In Celina, Miamian, and other soils, the B horizon has more clay than the parent material and the A horizon has less clay. In the B horizon of some soils, thin clay films are in pores and on faces of peds. This clay has been transferred from the A horizon.

An example of a transformation is the reduction and solubilization of ferrous iron. This process takes place under wet, saturated conditions in which there is no molecular oxygen. Gleying, or the reduction of iron, is evident in Cyclone, Kokomo, and Lippincott soils, which have a dominantly gray subsoil. The gray color indicates the presence of reduced ferrous iron, which, in turn, implies wetness. Reduced iron is soluble, but it commonly has been moved short distances in the soils in Preble County, stopping either in the horizon where it originated or in an underlying horizon. Part of this iron can be reoxidized and segregated in the form of stains, concretions, or bright yellow and red mottles.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

Ablation till. Loose, permeable till deposited during the final downwasting of glacial ice. Lenses of crudely sorted sand and gravel are common.

AC soil. A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvial fan. The fanlike deposit of a stream where it issues from a gorge upon a plain or of a tributary stream near or at its junction with its main stream.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Alpha, alpha-dipyridyl. A dye that when dissolved in 1N ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Aspect. The direction in which a slope faces.

Association, soil. A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available water capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Backslope. The position that forms the steepest and generally linear, middle portion of a hillslope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.

Backswamp. A floodplain landform. Extensive, marshy or swampy, depressed areas of flood plains between natural levees and valley sides or terraces.

Basal area. The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.

Basal till. Compact till deposited beneath the ice.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Base slope. A geomorphic component of hills consisting of the concave to linear (perpendicular to the contour) slope that, regardless of the lateral shape, forms an apron or wedge at the bottom of a hillside dominated by colluvium and slope-wash sediments (for example, slope alluvium).

Beach ridge. A low, essentially continuous mound of beach or beach and dune material heaped up by the action of waves and currents on the backshore of a beach, beyond the present limit

of storm waves, and occurring singly or as one of a series of approximately parallel deposits. These ridges define the limits of relict lakes.

Bedding planes. Fine strata, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediment.

Bedding system. A drainage system made by plowing, grading, or otherwise shaping the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bedrock-controlled topography. A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.

Beta horizon. A special type of lower Bt horizon with a significant accumulation of translocated silicate clay between two contrasting parent materials.

Borrow pit. An open excavation from which soil and underlying material have been removed, usually for construction purposes. Typically less than 2 acres in size. Larger areas are mapped as Udorthents.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Breaks. The steep and very steep broken land at the border of an upland summit that is dissected by ravines.

Breast height. An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.

Brush management. Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

Bulk density. The mass of a dry soil per unit bulk volume. The bulk volume is determined before drying to a constant weight at 105 degrees C. The value is expressed in grams per cubic centimeter.

Cable yarding. A method of moving felled trees to a nearby central area for transport to a processing facility. Most cable yarding systems involve use of a drum, a pole, and wire cables in an arrangement similar to that of a rod and reel used for fishing. To reduce friction and soil disturbance, felled trees generally are reeled in while one end is lifted or the entire log is suspended.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

California bearing ratio (CBR). The load-supporting capacity of a soil as compared to that of standard crushed limestone, expressed as a ratio. First standardized in California. A soil having a CBR of 16 supports 16 percent of the load that would be supported by standard crushed limestone, per unit area, with the same degree of distortion.

Canopy. The leafy crown of trees or shrubs. (See Crown.)

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Cement rock. Shaly limestone used in the manufacture of cement.

Channery soil material. Soil material that has, by

volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Chemical treatment. Control of unwanted vegetation through the use of chemicals.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay depletions. Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Clayey. Containing more than 35 percent clay.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Climax plant community. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Closed depression. A shallow, saucer-shaped area that is slightly lower on the landscape than the surrounding area and is without a natural outlet for surface drainage.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material. Material that has 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

COLE (coefficient of linear extensibility). See Linear extensibility.

Colluvium. Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Compaction. Any process by which the mineral grains of soil are rearranged to decrease void space and bring them into closer contact with one another, thereby increasing the weight of solid material per cubic foot. In agronomy, usually associated with machinery traffic across the soil during farming operations.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Conglomerate. A coarse grained, clastic rock composed of rounded or subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer textured material. Conglomerate is the consolidated equivalent of gravel.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper

tillage, adequate fertilization, and weed and pest control.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

Contour. An imaginary line on the surface of the earth connecting points of the same elevation.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Coprogenous earth (sedimentary peat). Fecal material deposited in water by aquatic organisms.

Corrosion. Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cropland. Land used primarily for the production of adapted cultivated, close-growing crops, fruit, or nut crops for harvest, alone or in association with sod crops.

Cropping system. Growing crops according to a planned system of rotation and management practices.

Cross-slope farming. Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.

Crown. The upper part of a tree or shrub, including the living branches and their foliage.

Culmination of the mean annual increment (CMAI). The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Delta. A body of alluvium having a surface that is nearly flat and fan shaped; deposited at or near the mouth of a river or stream where it enters a body of relatively quiet water, generally a sea or lake.

Dense material. A very firm, massive, noncemented, root-restrictive layer (commonly till) that has no cracks or in which the spacing of cracks that roots can enter is 10 centimeters or more. The materials within the survey area have a bulk density of more than 1.8 grams per cubic centimeter.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Depth to bedrock (in tables). Bedrock is too near the surface for the specified use.

Depth to dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Dip slope. A slope of the land surface, roughly

determined by and approximately conforming to the dip of the underlying bedrock.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Divided-slope farming. A form of field stripcropping in which crops are grown in a systematic arrangement of two strips, or bands, across the slope to reduce the hazard of water erosion. One strip is in a close-growing crop that provides protection from erosion, and the other strip is in a crop that provides less protection from erosion. This practice is used where slopes are not long enough to permit a full stripcropping pattern to be used.

Dolostone. A term used for the sedimentary rock dolomite in order to avoid confusion with the mineral of the same name. A carbonate sedimentary rock consisting mostly (more than 50 percent by weight) of the mineral dolomite [$CaMg(CO_3)_2$].

Drainage, surface. Runoff, or surface flow of water, from an area.

Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized=*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained*. These classes are defined in the "Soil Survey Manual."

Drainageway. A general term for a course or channel along which water moves in draining an area. A term restricted to relatively small, linear depressions that at some time move concentrated water and either do not have a defined channel or have only a small defined channel.

Draw. A small stream valley that generally is more open and has broader bottom land than a ravine or gulch.

Drift. Pulverized and other rock material transported by glacial ice and then deposited. Also, the sorted and unsorted material deposited by streams flowing from glaciers.

Duff. A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

Ecological site. An area where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. An ecological site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other ecological sites in kind and/or proportion of species or in total production.

Effervescence. The gaseous response (observed as bubbles) of soil to applied hydrochloric acid (HCl) or other chemicals. A field or laboratory test to determine the presence of carbonates in the soil.

Eluviation. The movement of material in true solution or colloidal suspension from one place

to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

End moraine. A moraine produced at the front of an actively flowing glacier at any given time.

Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Escarpment. A relatively continuous and steep slope or cliff, generally produced by erosion or faulting, breaking the general continuity of more gently sloping land surfaces. Exposed nonbedrock material is nonsoil material or very shallow, poorly developed soil. Typically 0.1 acre to 2 acres in size. Synonym: scarp.

Esker. A narrow, winding ridge of stratified gravelly and sandy drift deposited by a stream flowing in a tunnel beneath a glacier.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity*.

Filtering capacity (in tables). Because of rapid or very rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Fine textured soil. Sandy clay, silty clay, or clay.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flaggy soil material. Material that has, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

Floodplain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fluvial. Of or pertaining to rivers; produced by river action, as a fluvial plain.

Footslope. The geomorphic component that forms the inner, gently inclined surface at the base of a hillslope. The surface profile is dominantly concave. In terms of gradational processes, the

footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

Forb. Any herbaceous plant not a grass or a sedge.

Forest cover. All trees and other woody plants (underbrush) covering the ground in a forest.

Forest type. A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil–forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Glaciofluvial deposits. Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.

Glaciolacustrine deposits. Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are interbedded or laminated.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Graded stripcropping. Growing crops in strips that grade toward a protected waterway.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravel pit. An open excavation from which soil and the loose underlying material have been removed and used as a source of sand or gravel, usually for construction purposes.

Gravelly soil material. Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Gravelly spot. An area in which the surface layer has more than 35 percent, by volume, rock fragments (mostly less than 3 inches in diameter) in an area of surrounding soil that has less than 15 percent rock fragments.

Green manure crop (agronomy). A soil–improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground moraine. An extensive, fairly even layer of till that has an uneven, undulating surface; a deposit of rock and mineral debris dragged along, in, on, and beneath a glacier and emplaced by processes including basal lodgment and release from downwasting stagnant ice by ablation.

Ground water. Water filling all the unblocked pores of the material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hard to reclaim (in tables). Reclamation is difficult after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or

clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Head out. To form a flower head.

Head slope. A geomorphic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainageway. The overland waterflow is converging.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.

High–residue crops. Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Hill. A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil–forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil–forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Igneous rock. Rock formed by solidification from a molten or partially molten state. Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement

of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Interfluve. An elevated area between two drainageways that sheds water to those drainageways.

Intermittent stream. A stream, or reach of a stream, that flows for prolonged periods only when it receives ground–water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Iron depletions. Low–chroma zones having a low content of iron and manganese oxide because of chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close–growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Kame. An irregular, short ridge or hill of stratified drift.

Karst (topography). The relief of an area underlain by limestone that dissolves in differing degrees, thus forming numerous depressions or small basins.

Knoll. A small, low, rounded hill rising above adjacent landforms.

Lacustrine deposit. Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Landfill. An area where waste products of human habitation are disposed. These products can be above or below natural ground level.

Landslide. The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Limestone. A sedimentary rock composed of calcium carbonate. There are many impure varieties.

Linear extensibility. Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is used to determine the shrink-swell potential of soils. It is an expression of the volume change between the water content of the clod at 1/3- or 1/10-bar tension (33kPa or 10kPa tension) and oven dryness. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Lithic contact. A boundary between soil and continuous, coherent underlying material. The underlying material must be sufficiently coherent to make hand digging with a spade impractical.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt–sized particles, deposited by wind.

Longshore bar. A narrow, elongate, coarse textured ridge that once rose near to, or barely above, a pluvial or glacial lake and extended generally parallel to the shore but was separated from it by an intervening trough or lagoon; both the bar and lagoon are now relict features.

Low–residue crops. Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

Low strength. The soil is not strong enough to support loads.

Marl. An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal amounts.

Marsh. A water–saturated, very poorly drained area, intermittently or permanently covered by water. Marsh areas dominantly support sedges, cattails, and rushes. Not used in map units where poorly drained or very poorly drained soils are the named components. Typically 0.5 acre to 2 acres in size.

Masses. Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon. A thick, dark, humus–rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Moraine. An accumulation of earth, stones, and other debris deposited by a glacier. Some types are terminal, lateral, medial, and ground.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those

horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance=*few, common,* and *many;* size=*fine, medium,* and *coarse;* and contrast=*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Mudstone. Sedimentary rock formed by induration of silt and clay in approximately equal amounts.

Mulch. Any material, such as straw, sawdust, leaves, plastic film, or loose soil, that is spread upon the surface of the soil to protect the soil and plant roots from the effects of raindrops, soil crusting, freezing, and evaporation.

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules. Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. If formed in place, nodules of iron oxide or manganese oxide are considered types of redoximorphic concentrations.

No–till farming. A method of planting crops that involves no seedbed preparation other than opening the soil for the purpose of placing the seed at the intended depth, which typically involves opening a small slit or punching a hole into the soil. There is usually no cultivation during crop production. Chemical weed control is normally used.

Nose slope. A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Outwash. Gravel, sand, and silt, commonly stratified, deposited by glacial meltwater.

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Paralithic contact. Similar to a lithic contact, except that the underlying material is softer and can be dug with difficulty with a spade.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Pebbles. Rounded or partially rounded rock or mineral fragments between 2 and 75 millimeters in diameter.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The movement of water through the

soil.

Perennial water. A natural or manmade lake, pool, pit, or stream course that contains water for most of the year.

Permafrost. Layers of soil, or even bedrock, occurring in arctic or subarctic regions, in which a temperature below freezing has existed continuously for a long time.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Impermeable	less than 0.0015
Very slow	0.0015 to 0.06
Slow	0.06 to 0.2
Moderately slow	0.2 to 0.6
Moderate	0.6 inch to 2.0
Moderately rapid	2.0 to 6.0
Rapid	6.0 to 20
Very rapid	more than 20

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Potential native plant community. See Climax plant community.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning. Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Quarry. An open excavation from which bedrock has been removed.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Red beds. Sedimentary strata that are mainly red and are made up largely of sandstone and shale.

Redoximorphic concentrations. Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

Redoximorphic depletions. Low–chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

Redoximorphic features. Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha, alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

Reduced matrix. A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Restricted permeability (in tables). The slow movement of water through the soil adversely affects the specified use.

Rill. A steep–sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Rise. A geomorphic component of flat plains (e.g., lake plain, low coastal plain, low–gradient till plain) consisting of a slightly elevated but low, broad area with slow slope gradients (*i.e., slopes of 1 to 3 percent); typically a microfeature but can be fairly extensive. Commonly, soils on a rise are better drained than those in the surrounding flat area.*

Riser. The sloping surface of a series of natural steplike landforms, as those of successive stream terraces.

Road cut. A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rock outcrop. Exposures of base bedrock, typically hard rock, at the surface of the earth.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called groundwater runoff or seepage flow from groundwater.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand–sized particles.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Scarification. The act of abrading, scratching, loosening, crushing, or modifying the surface to increase water absorption or to provide a more tillable soil.

Second bottom. The first terrace above the normal flood plain (or first bottom) of a river.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind–deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Short steep slope. A narrow area in which the soil has slopes that are at least two slope classes steeper than the slope class of the surrounding map unit.

Shoulder. The position that forms the uppermost inclined surface near the top of a hillslope. It is a transition from backslope to summit. The surface is dominantly convex in profile and erosional in origin.

Shrink–swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Side slope. A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt–sized particles.

Sinkhole. A depression in the landscape where limestone has been dissolved.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Slick spot. A small area of soil having a puddled, crusted, or smooth surface and an excess of exchangeable sodium. The soil generally is silty or clayey, is slippery when wet, and is low in productivity.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Sloughed till. Water-saturated till that has flowed slowly downhill from its original place of deposit by glacial ice. It may rest on other till, on outwash, or on a glaciolacustrine deposit.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Stone line. A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsidence. The loss in volume that occurs in muck soils when they oxidize or dry.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summit. The topographically highest position of a hillslope. It has a nearly level (planar or only slightly convex) surface.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Swamp. An area that is saturated with water throughout much of the year but in which the surface of the soil is generally not deeply submerged. Swamp areas dominantly support trees and shrubs.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

Terminal moraine. A belt of thick drift that generally

marks the termination of important glacial advances.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material that is too thin for the specified use.

Till. Unsorted, nonstratified drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Till plain. An extensive area of nearly level to undulating soils underlain by till.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope. The position that forms the gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed–depression floors.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Tread. The flat or gently sloping surface of natural steplike landforms, commonly one of a series, such as successive stream terraces.

Typical pedon. The site of the pedon described as typical for the series in the survey area.

Upland. Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Valley fill. In glaciated regions, material deposited in stream valleys by glacial meltwater. In nonglaciated regions, alluvium deposited by heavily loaded streams.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Varve. A sedimentary layer or a lamina or sequence of laminae deposited in a body of still water within a year. Specifically, a thin pair of graded glaciolacustrine layers seasonally deposited, usually by meltwater streams, in a glacial lake or other body of still water in front of a glacier.

Water bars. Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.

Water table. The upper surface of ground water, or the level below which the soil is saturated with water.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wet spot. An area of soil that is somewhat poorly drained to very poorly drained and that is at least two drainage classes wetter than the named soils in the surrounding map unit.

Wilting point (or permanent wilting point). The

moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Windthrow. The uprooting and tipping over of trees by the wind.

TABLES

TABLE 1.--TEMPERATURE AND PRECIPITATION

(Recorded in the period 1971-2000 at EATON, OH2485. See text on page 9 for additional information.)

Month	Temperature						Precipitation				
				2 years in 10 will have--				2 years in 10 will have--			
	Average daily maximum	Average daily minimum	Average	Maximum temperature higher than--	Minimum temperature lower than--	Average number of growing degree days*	Average	Less than--	More than--	Average number of days with 0.10 inch or more	Average snowfall
	0F	0F	0F	0F	0F	Units	In	In	In		In
January-----	33.6	15.6	24.6	62	-18	2	2.57	1.41	3.60	6	3.4
February----	38.6	18.7	28.7	69	-10	2	2.30	1.12	3.33	5	2.8
March-------	49.7	27.9	38.8	78	3	32	3.25	2.20	4.20	7	1.4
April-------	61.3	36.8	49.1	84	19	98	4.03	2.50	5.41	8	0.4
May---------	72.1	48.1	60.1	89	30	324	4.72	2.60	6.60	8	0.0
June--------	80.7	57.1	68.9	94	40	558	3.86	2.28	5.27	6	0.0
July--------	84.6	61.0	72.8	97	45	697	3.74	1.98	5.27	6	0.0
August------	83.2	59.1	71.1	94	44	657	3.30	1.82	4.60	6	0.0
September---	76.9	51.5	64.2	92	33	429	2.64	1.12	3.93	4	0.0
October-----	64.7	39.4	52.1	84	21	141	2.74	1.50	3.84	5	0.0
November----	50.9	31.2	41.0	75	12	36	3.41	1.85	4.80	6	0.0
December----	38.7	21.7	30.2	65	-7	6	3.03	1.73	4.18	6	2.0
Yearly:											
Average---	61.3	39.0	50.1	---	---	---	---	---	---	---	---
Extreme---	102	-33	---	97	-20	---	---	---	---	---	---
Total-----	---	---	---	---	---	2983	39.58	34.31	44.16	73	10.0

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 degrees. F)

TABLE 2.--FREEZE DATES IN SPRING AND FALL

(Recorded in the period 1971-2000 at EATON, OH2485. See text on page 9 for additional information.)

Probability	Temperature		
	24 0F or lower	28 0F or lower	32 0F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	April 21	May 1	May 15
2 year in 10 later than--	April 16	April 26	May 9
5 year in 10 later than--	April 6	April 16	April 29
First freezing temperature in fall:			
1 yr in 10 earlier than--	October 11	October 2	September 23
2 yr in 10 earlier than--	October 18	October 9	September 29
5 yr in 10 earlier than--	October 30	October 21	October 9

TABLE 3.--GROWING SEASON

(Recorded for the period 1971-2000 at EATON, OH2485. See text on page 9 for additional information.)

Probability	Daily Minimum Temperature During growing season		
	Higher than 24 0F	Higher than 28 0F	Higher than 32 0F
	Days	Days	Days
9 years in 10	177	160	141
8 years in 10	187	170	149
5 years in 10	207	188	164
2 years in 10	226	206	180
1 year in 10	236	216	188

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE MAP UNITS

Map symbol	Soil name	Acres	Percent
CeA	Celina silt loam, 0 to 2 percent slopes	5,375	2.0
CeB	Celina silt loam, 2 to 6 percent slopes	31,313	11.5
CeB2	Celina silt loam, 2 to 6 percent slopes, eroded	12,937	4.7
CoA	Corwin silt loam, 0 to 2 percent slopes	352	0.1
CtA	Crosby-Celina silt loams, 0 to 2 percent slopes	23,574	8.6
CtB	Crosby-Celina silt loams, 2 to 4 percent slopes	14,069	5.2
CvA	Crosby-Lewisburg silt loams, 0 to 2 percent slopes	1,446	0.5
CyA	Cyclone silt loam, 0 to 2 percent slopes	7,086	2.6
DaA	Dana silt loam, 0 to 2 percent slopes	297	0.1
DaB	Dana silt loam, 2 to 6 percent slopes	314	0.1
EeA	Eel silt loam, gravelly substratum, 0 to 1 percent slopes, occasionally flooded	1,763	0.6
EgA	Eldean gravelly loam, 0 to 2 percent slopes	54	*
EgB	Eldean gravelly loam, 2 to 6 percent slopes	94	*
EgB2	Eldean gravelly loam, 2 to 6 percent slopes, eroded	79	*
EhC3	Eldean gravelly clay loam, 6 to 12 percent slopes, severely eroded	708	0.3
EhD3	Eldean gravelly clay loam, 12 to 18 percent slopes, severely eroded	139	*
EkA	Eldean loam, 0 to 2 percent slopes	1,731	0.6
EkB	Eldean loam, 2 to 6 percent slopes	1,411	0.5
EkB2	Eldean loam, 2 to 6 percent slopes, eroded	871	0.3
FcA	Fincastle silt loam, 0 to 2 percent slopes	2,161	0.8
FdA	Fincastle silt loam, bedrock substratum, 0 to 2 percent slopes	61	*
FmA	Fox silt loam, till substratum, 0 to 2 percent slopes	760	0.3
FmB	Fox silt loam, till substratum, 2 to 6 percent slopes	261	*
FmB2	Fox silt loam, till substratum, 2 to 6 percent slopes, eroded	117	*
HeF2	Hennepin-Miamian silt loams, 25 to 50 percent slopes, eroded	3,513	1.3
HwE2	Hennepin-Wynn silt loams, 18 to 25 percent slopes, eroded	291	0.1
HwF2	Hennepin-Wynn silt loams, 25 to 50 percent slopes, eroded	704	0.3
KeC2	Kendallville-Eldean silt loams, 6 to 12 percent slopes, eroded	1,574	0.6
KeD2	Kendallville-Eldean silt loams, 12 to 18 percent slopes, eroded	736	0.3
KnA	Kokomo silt loam, 0 to 1 percent slopes	20,236	7.4
KoA	Kokomo silty clay loam, 0 to 1 percent slopes	18,750	6.9
LeB	Lewisburg-Celina silt loams, 2 to 6 percent slopes	1,140	0.4
LfB2	Lewisburg-Celina clay loams, 2 to 6 percent slopes, eroded	749	0.3
LgC3	Lewisburg clay loam, 6 to 12 percent slopes, severely eroded	226	*
LpA	Lippincott silty clay loam, 0 to 2 percent slopes	419	0.2
MaA	Medway silt loam, 0 to 1 percent slopes, occasionally flooded	1,878	0.7
MbB2	Miami silt loam, 2 to 6 percent slopes, eroded	1,228	0.4
McE2	Miami-Kendallville silt loams, 18 to 25 percent slopes, eroded	279	0.1
McF2	Miami-Kendallville silt loams, 25 to 50 percent slopes, eroded	113	*
MdC2	Miami loam, 6 to 12 percent slopes, eroded	994	0.4
MdD2	Miami loam, 12 to 18 percent slopes, eroded	583	0.2
MeC	Miamian silt loam, 6 to 12 percent slopes	163	*
MeC2	Miamian silt loam, 6 to 12 percent slopes, eroded	16,165	5.9
MeD2	Miamian silt loam, 12 to 18 percent slopes, eroded	2,853	1.0
MfB	Miamian-Celina silt loams, 2 to 6 percent slopes	8,311	3.0
MfB2	Miamian-Celina silt loams, 2 to 6 percent slopes, eroded	18,395	6.7
MgE2	Miamian-Kendallville silt loams, 18 to 25 percent slopes, eroded	446	0.2
MgF2	Miamian-Kendallville silt loams, 25 to 50 percent slopes, eroded	1,138	0.4
MhC3	Miamian-Losantville clay loams, 6 to 12 percent slopes, severely eroded	10,889	4.0
MhD3	Miamian-Losantville clay loams, 12 to 18 percent slopes, severely eroded	5,706	2.1
MmE2	Miamian-Hennepin silt loams, 18 to 25 percent slopes, eroded	2,896	1.1
MnE3	Miamian-Hennepin clay loams, 18 to 25 percent slopes, severely eroded	1,217	0.4
MpA	Milford silty clay loam, 0 to 2 percent slopes	45	*
MrA	Milford silty clay loam, gravelly substratum, 0 to 2 percent slopes	55	*
MsA	Millsdale silt loam, 0 to 2 percent slopes	150	*
MtA	Millsdale silty clay loam, 0 to 2 percent slopes	106	*
MuA	Milton silt loam, 0 to 2 percent slopes	203	*
MuB	Milton silt loam, 2 to 6 percent slopes	331	0.1
MuB2	Milton silt loam, 2 to 6 percent slopes, eroded	673	0.2
MuC2	Milton silt loam, 6 to 12 percent slopes, eroded	444	0.2
MuD2	Milton silt loam, 12 to 18 percent slopes, eroded	200	*
MuE2	Milton silt loam, 18 to 25 percent slopes, eroded	107	*
MwA	Morningsun silt loam, 0 to 2 percent slopes	1,108	0.4
MxA	Morningsun-Xenia silt loams, 0 to 2 percent slopes	1,072	0.4
MxB	Morningsun-Xenia silt loams, 2 to 6 percent slopes	628	0.2
MxB2	Morningsun-Xenia silt loams, 2 to 6 percent slopes, eroded	167	*
MyA	Mahalasville silt loam, 0 to 2 percent slopes	159	*
OcA	Ockley silt loam, 0 to 2 percent slopes	896	0.3
OcB	Ockley silt loam, 2 to 6 percent slopes	647	0.2
Pg	Pits, gravel	314	0.1
Pq	Pits, quarry	55	*
PtB	Plattville silt loam, moderately wet, 2 to 6 percent slopes	162	*
RaA	Rainsville silt loam, 0 to 2 percent slopes	677	0.2

- See footnote at end of table.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE MAP UNITS--Continued

Map symbol	Soil name	Acres	Percent
RaB	Rainsville silt loam, 2 to 6 percent slopes	1,220	0.4
RaB2	Rainsville silt loam, 2 to 6 percent slopes, eroded	1,336	0.5
RcA	Randolph silt loam, 0 to 2 percent slopes	187	*
RcB	Randolph silt loam, 2 to 6 percent slopes	138	*
RnE2	Rodman gravelly loam, 18 to 25 percent slopes, eroded	61	*
RnF2	Rodman gravelly loam, 25 to 50 percent slopes, eroded	25	*
RoE2	Rodman-Kendallville complex, 18 to 25 percent slopes, eroded	198	*
RoF2	Rodman-Kendallville complex, 25 to 50 percent slopes, eroded	365	0.1
RpA	Rossburg silt loam, moderately wet, sandy substratum, 0 to 1 percent slopes, occasionally flooded	5,295	1.9
RuB	Russell-Miamian silt loams, 2 to 6 percent slopes	2,315	0.8
RuB2	Russell-Miamian silt loams, 2 to 6 percent slopes, eroded	2,072	0.8
SeA	Savona silt loam, 0 to 2 percent slopes	84	*
SnA	Sloan silt loam, sandy substratum, 0 to 1 percent slopes, frequently flooded	2,112	0.8
StA	Stonelick loam, gravelly substratum, 0 to 1 percent slopes, frequently flooded	4,019	1.5
SvA	Sugarvalley silt loam, 0 to 2 percent slopes	1,701	0.6
SwA	Sugarvalley-Fincastle silt loams, 0 to 2 percent slopes	1,188	0.4
ThA	Thackery silt loam, 0 to 2 percent slopes	1,488	0.5
ThB	Thackery silt loam, 2 to 6 percent slopes	229	*
Ud	Udorthents	142	*
W	Water	1,559	0.6
WbA	Warsaw loam, 0 to 2 percent slopes	166	*
WnA	Westland silt loam, 0 to 2 percent slopes	3,387	1.2
WyB	Wynn silt loam, 2 to 6 percent slopes	408	0.1
WyB2	Wynn silt loam, 2 to 6 percent slopes, eroded	420	0.2
WyC2	Wynn silt loam, 6 to 12 percent slopes, eroded	1,109	0.4
WyD2	Wynn silt loam, 12 to 18 percent slopes, eroded	161	*
XeA	Xenia silt loam, 0 to 2 percent slopes	2,772	1.0
XeB	Xenia silt loam, 2 to 6 percent slopes	1,686	0.6
XeB2	Xenia silt loam, 2 to 6 percent slopes, eroded	220	*
XfB	Xenia silt loam, bedrock substratum, 2 to 6 percent slopes	120	*
	Total	272,947	100.0

*** Less than 0.1 percent.**

TABLE 5.--PRIME FARMLAND

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland. If a soil is prime farmland only under certain conditions, the conditions are specified in parentheses after the soil name. See text on page 184 for additional information.)

Map symbol	Soil name
CeA	Celina silt loam, 0 to 2 percent slopes
CeB	Celina silt loam, 2 to 6 percent slopes
CeB2	Celina silt loam, 2 to 6 percent slopes, eroded
CoA	Corwin silt loam, 0 to 2 percent slopes
CtA	Crosby-Celina silt loams, 0 to 2 percent slopes (Prime farmland if drained)
CtB	Crosby-Celina silt loams, 2 to 4 percent slopes (Prime farmland if drained)
CvA	Crosby-Lewisburg silt loams, 0 to 2 percent slopes (Prime farmland if drained)
CyA	Cyclone silt loam, 0 to 2 percent slopes (Prime farmland if drained)
DaA	Dana silt loam, 0 to 2 percent slopes
DaB	Dana silt loam, 2 to 6 percent slopes
EeA	Eel silt loam, gravelly substratum, 0 to 1 percent slopes, occasionally flooded
EgA	Eldean gravelly loam, 0 to 2 percent slopes
EgB	Eldean gravelly loam, 2 to 6 percent slopes
EgB2	Eldean gravelly loam, 2 to 6 percent slopes, eroded
EkA	Eldean loam, 0 to 2 percent slopes
EkB	Eldean loam, 2 to 6 percent slopes
EkB2	Eldean loam, 2 to 6 percent slopes, eroded
FcA	Fincastle silt loam, 0 to 2 percent slopes (Prime farmland if drained)
FdA	Fincastle silt loam, bedrock substratum, 0 to 2 percent slopes (Prime farmland if drained)
FmA	Fox silt loam, till substratum, 0 to 2 percent slopes
FmB	Fox silt loam, till substratum, 2 to 6 percent slopes
FmB2	Fox silt loam, till substratum, 2 to 6 percent slopes, eroded
KnA	Kokomo silt loam, 0 to 1 percent slopes (Prime farmland if drained)
KoA	Kokomo silty clay loam, 0 to 1 percent slopes (Prime farmland if drained)
LeB	Lewisburg-Celina silt loams, 2 to 6 percent slopes
LfB2	Lewisburg-Celina clay loams, 2 to 6 percent slopes, eroded
LpA	Lippincott silty clay loam, 0 to 2 percent slopes (Prime farmland if drained)
MaA	Medway silt loam, 0 to 1 percent slopes, occasionally flooded
MbB2	Miami silt loam, 2 to 6 percent slopes, eroded
MfB	Miamian-Celina silt loams, 2 to 6 percent slopes
MfB2	Miamian-Celina silt loams, 2 to 6 percent slopes, eroded
MpA	Milford silty clay loam, 0 to 2 percent slopes (Prime farmland if drained)
MrA	Milford silty clay loam, gravelly substratum, 0 to 2 percent slopes (Prime farmland if Drained)
MsA	Millsdale silt loam, 0 to 2 percent slopes (Prime farmland if drained)
MtA	Millsdale silty clay loam, 0 to 2 percent slopes (Prime farmland if drained)
MuA	Milton silt loam, 0 to 2 percent slopes
MuB	Milton silt loam, 2 to 6 percent slopes
MuB2	Milton silt loam, 2 to 6 percent slopes, eroded
MwA	Morningsun silt loam, 0 to 2 percent slopes
MxA	Morningsun-Xenia silt loams, 0 to 2 percent slopes
MxB	Morningsun-Xenia silt loams, 2 to 6 percent slopes
MxB2	Morningsun-Xenia silt loams, 2 to 6 percent slopes, eroded
MyA	Mahalasville silt loam, 0 to 2 percent slopes (Prime farmland if drained)
OcA	Ockley silt loam, 0 to 2 percent slopes
OcB	Ockley silt loam, 2 to 6 percent slopes
PtB	Plattville silt loam, moderately wet, 2 to 6 percent slopes
RaA	Rainsville silt loam, 0 to 2 percent slopes
RaB	Rainsville silt loam, 2 to 6 percent slopes
RaB2	Rainsville silt loam, 2 to 6 percent slopes, eroded
RcA	Randolph silt loam, 0 to 2 percent slopes (Prime farmland if drained)
RcB	Randolph silt loam, 2 to 6 percent slopes (Prime farmland if drained)
RpA	Rossburg silt loam, moderately wet, sandy substratum, 0 to 1 percent slopes, occasionally flooded
RuB	Russell-Miamian silt loams, 2 to 6 percent slopes
RuB2	Russell-Miamian silt loams, 2 to 6 percent slopes, eroded
SeA	Savona silt loam, 0 to 2 percent slopes (Prime farmland if drained)
SnA	Sloan silt loam, sandy substratum, 0 to 1 percent slopes, frequently flooded (Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season)

Table 5.--Prime Farmland--Continued

Map symbol	Soil name
StA	Stonelick loam, gravelly substratum, 0 to 1 percent slopes, frequently flooded (Prime farmland if protected from flooding or not frequently flooded during the growing season) protected from flooding or not frequently flooded during the growing season)
SvA	Sugarvalley silt loam, 0 to 2 percent slopes (Prime farmland if drained)
SwA	Sugarvalley-Fincastle silt loams, 0 to 2 percent slopes (Prime farmland if drained)
ThA	Thackery silt loam, 0 to 2 percent slopes
ThB	Thackery silt loam, 2 to 6 percent slopes
WbA	Warsaw loam, 0 to 2 percent slopes
WnA	Westland silt loam, 0 to 2 percent slopes (Prime farmland if drained)
WyB	Wynn silt loam, 2 to 6 percent slopes
WyB2	Wynn silt loam, 2 to 6 percent slopes, eroded
XeA	Xenia silt loam, 0 to 2 percent slopes
XeB	Xenia silt loam, 2 to 6 percent slopes
XeB2	Xenia silt loam, 2 to 6 percent slopes, eroded
XfB	Xenia silt loam, bedrock substratum, 2 to 6 percent slopes

TABLE 6.--HYDRIC SOILS LIST

(See text on page 186 for additional information)

Map symbol	Soil name
CyA	Cyclone silt loam, 0 to 2 percent slopes
KnA	Kokomo silt loam, 0 to 1 percent slopes
KoA	Kokomo silty clay loam, 0 to 1 percent slopes
LpA	Lippincott silty clay loam, 0 to 2 percent slopes
MpA	Milford silty clay loam, 0 to 2 percent slopes
MrA	Milford silty clay loam, gravelly substratum, 0 to 2 percent slopes
MsA	Millsdale silt loam, 0 to 2 percent slopes
MtA	Millsdale silty clay loam, 0 to 2 percent slopes
MyA	Mahalasville silt loam, 0 to 2 percent slopes
SnA	Sloan silt loam, sandy substratum, 0 to 1 percent slopes, frequently flooded
WnA	Westland silt loam, 0 to 2 percent slopes

TABLE 7.--NON-HYDRIC MAPUNITS WITH HYDRIC COMPONENTS

(See text on page 186 for additional information)

Map symbol and map unit name	Hydric Component	Landform
CeA: Celina silt loam, 0 to 2 percent slopes	Kokomo	depression, till plain
CeB: Celina silt loam, 2 to 6 percent slopes	Kokomo	depression, till plain
CeB2: Celina silt loam, 2 to 6 percent slopes, eroded	Kokomo	depression, till plain
CoA: Corwin silt loam, 0 to 2 percent slopes	Kokomo	depression, till plain
CtA: Crosby-Celina silt loams, 0 to 2 percent slopes	Kokomo	depression, till plain
CtB: Crosby-Celina silt loams, 2 to 4 percent slopes	Kokomo	depression, till plain
CvA: Crosby-Lewisburg silt loams, 0 to 2 percent slopes	Kokomo	depression, till plain
DaA: Dana silt loam, 0 to 2 percent slopes	Cyclone	depression, till plain
DaB: Dana silt loam, 2 to 6 percent slopes	Cyclone	depression, till plain
EeA: Eel silt loam, gravelly substratum, 0 to 1 percent slopes, occasionally flooded	Sloan	flood plain
FcA: Fincastle silt loam, 0 to 2 percent slopes	Cyclone	depression, till plain
FdA: Fincastle silt loam, bedrock substratum, 0 to 2 percent slopes	Cyclone	depression, till plain

Table 7.--Non-hydric Mapunits With Hydric Components—Continued

Map symbol and map unit name	Hydric Component	Landform
FmA: Fox silt loam, till substratum, 0 to 2 percent slopes	Westland	depression, outwash
FmB: Fox silt loam, till substratum, 2 to 6 percent slopes	Westland	depression, outwash terrace
FmB2: Fox silt loam, till substratum, 2 to 6 percent slopes, eroded	Westland	depression, outwash terrace
LeB: Lewisburg-Celina silt loams, 2 to 6 percent slopes	Kokomo	depression, till plain
LfB2: Lewisburg-Celina clay loams, 2 to 6 percent slopes, eroded	Kokomo	depression, till plain
MaA: Medway silt loam, 0 to 1 percent slopes, occasionally flooded	Sloan	flood plain
MfB: Miamian-Celina silt loams, 2 to 6 percent slopes	Kokomo	depression, till plain
MfB2: Miamian-Celina silt loams, 2 to 6 percent slopes, eroded	Kokomo	depression, till plain
MwA: Morningsun silt loam, 0 to 2 percent slopes	Cyclone	depression, till plain
MxA: Morningsun-Xenia silt loams, 0 to 2 percent slopes	Cyclone	depression, till plain
PtB: Plattville silt loam, moderately wet, 2 to 6 percent slopes	Millsdale	depression, outwash terrace
RcA: Randolph silt loam, 0 to 2 percent slopes	Millsdale	depression, outwash terrace

Table 7.--Non-hydric Mapunits With Hydric Components—Continued

Map symbol and map unit name	Hydric Component	Landform
RpA: Rossburg silt loam, moderately wet, sandy substratum, 0 to 1 percent slopes, occasionally flooded	Sloan	flood plain
SeA: Savona silt loam, 0 to 2 percent slopes	Lippincott	depression, outwash terrace
SvA: Sugarvalley silt loam, 0 to 2 percent slopes	Cyclone	depression, till plain
SwA: Sugarvalley-Fincastle silt loams, 0 to 2 percent slopes	Cyclone	depression, till plain
ThA: Thackery silt loam, 0 to 2 percent slopes	Westland	depression, outwash terrace
ThB: Thackery silt loam, 2 to 6 percent slopes	Westland	depression, outwash terrace
XeA: Xenia silt loam, 0 to 2 percent slopes	Cyclone	depression, till plain
XfB: Xenia silt loam, bedrock substratum, 2 to 6 percent slopes	Cyclone	depression, till plain

TABLE 8.--CROPLAND LIMITATIONS AND HAZARDS

(See text on page 190 for a description of the limitations and hazards listed in this table. Only soils suitable for cultivated crops are listed in this table.)

Map symbol and soil name	Limitations for Corn and Soybeans: Rating class and limiting features	Value	Limitations for Wheat: Rating class and limiting features	Value
CeA:				
Celina	Very limited		Very limited	
	restricted permeability	1.00	frost action	1.00
	susceptible to compaction	0.50	restricted permeability	1.00
	surface crusting	0.45	susceptible to compaction	0.50
	root restrictive layer	0.09	surface crusting	0.45
			root restrictive layer	0.09
CeB:				
Celina	Very limited		Very limited	
	restricted permeability	1.00	frost action	1.00
	susceptible to compaction	0.50	restricted permeability	1.00
	surface crusting	0.45	susceptible to compaction	0.50
	erosion hazard	0.27	surface crusting	0.45
	root restrictive layer	0.02	erosion hazard	0.27
			root restrictive layer	0.02
CeB2:				
Celina	Very limited		Very limited	
	surface crusting	1.00	frost action	1.00
	restricted permeability	1.00	surface crusting	1.00
	root restrictive layer	0.69	restricted permeability	1.00
	susceptible to compaction	0.50	root restrictive layer	0.69
	erosion hazard	0.27	susceptible to compaction	0.50
	tilth	0.25	erosion hazard	0.27
			tilth	0.25
CoA:				
Corwin	Somewhat limited		Somewhat limited	
	susceptible to compaction	0.50	susceptible to compaction	0.50
	root restrictive layer	0.02	root restrictive layer	0.02
	surface crusting	0.01	surface crusting	0.01

TABLE 8.--Cropland Limitations and Hazards--Continued

Map symbol and soil name	Limitations for Corn and Soybeans: Rating class and limiting features	Value	Limitations for Wheat: Rating class and limiting features	Value
CtA:				
Crosby	Very limited		Very limited	
	seasonal high water table	1.00	frost action	1.00
	susceptible to compaction	0.50	seasonal high water table	1.00
	surface crusting	0.45	susceptible to compaction	0.50
	clay content	0.04	surface crusting	0.45
	root restrictive layer	0.01	clay content	0.04
	available water capacity	0.01	root restrictive layer	0.01
			available water capacity	0.01
Celina	Very limited		Very limited	
	restricted permeability	1.00	frost action	1.00
	susceptible to compaction	0.50	restricted permeability	1.00
	surface crusting	0.45	susceptible to compaction	0.50
	root restrictive layer	0.20	surface crusting	0.45
			root restrictive layer	0.20
CtB:				
Crosby	Very limited		Very limited	
	seasonal high water table	1.00	frost action	1.00
	susceptible to compaction	0.50	seasonal high water table	1.00
	surface crusting	0.45	susceptible to compaction	0.50
	root restrictive layer	0.34	surface crusting	0.45
	available water capacity	0.17	root restrictive layer	0.34
	erosion hazard	0.15	available water capacity	0.17
	clay content	0.04	erosion hazard	0.15
			clay content	0.04
Celina	Very limited		Very limited	
	restricted permeability	1.00	frost action	1.00
	susceptible to compaction	0.50	restricted permeability	1.00
	surface crusting	0.45	susceptible to compaction	0.50
	erosion hazard	0.09	surface crusting	0.45
	root restrictive layer	0.01	erosion hazard	0.09
			root restrictive layer	0.01

TABLE 8.--Cropland Limitations and Hazards--Continued

Map symbol and soil name	Limitations for Corn and Soybeans: Rating class and limiting features	Value	Limitations for Wheat: Rating class and limiting features	Value
CvA:				
Crosby	Very limited		Very limited	
	seasonal high water table	1.00	frost action	1.00
	susceptible to compaction	0.50	seasonal high water table	1.00
	surface crusting	0.45	susceptible to compaction	0.50
	root restrictive layer	0.09	surface crusting	0.45
	available water capacity	0.01	root restrictive layer	0.09
			available water capacity	0.01
Lewisburg	Very limited		Very limited	
	seasonal high water table	1.00	root restrictive layer	1.00
	root restrictive layer	1.00	frost action	1.00
	susceptible to compaction	0.50	seasonal high water table	1.00
	surface crusting	0.45	susceptible to compaction	0.50
			surface crusting	0.45
CyA:				
Cyclone	Very limited		Very limited	
	seasonal high water table	1.00	ponding	1.00
	ponding	1.00	frost action	1.00
	susceptible to compaction	0.50	seasonal high water table	1.00
	ground water pollution	0.50	susceptible to compaction	0.50
			ground water pollution	0.50
DaA:				
Dana	Somewhat limited		Very limited	
	susceptible to compaction	0.50	frost action	1.00
			susceptible to compaction	0.50
DaB:				
Dana	Somewhat limited		Very limited	
	susceptible to compaction	0.50	frost action	1.00
	erosion hazard	0.14	susceptible to compaction	0.50
			erosion hazard	0.14

TABLE 8.--Cropland Limitations and Hazards--Continued

Map symbol and soil name	Limitations for Corn and Soybeans: Rating class and limiting features	Value	Limitations for Wheat: Rating class and limiting features	Value
EeA:				
Eel	Very limited		Very limited	
	ground water pollution	1.00	frost action	1.00
	flooding	1.00	ground water pollution	1.00
	susceptible to compaction	0.50	flooding	1.00
	surface crusting	0.11	susceptible to compaction	0.50
			surface crusting	0.11
EgA:				
Eldean	Very limited		Very limited	
	ground water pollution	1.00	ground water pollution	1.00
	available water capacity	0.55	available water capacity	0.55
	root restrictive layer	0.52	root restrictive layer	0.52
EgB:				
Eldean	Very limited		Very limited	
	ground water pollution	1.00	ground water pollution	1.00
	available water capacity	0.55	available water capacity	0.55
	root restrictive layer	0.52	root restrictive layer	0.52
	erosion hazard	0.10	erosion hazard	0.10
EgB2:				
Eldean	Very limited		Very limited	
	ground water pollution	1.00	ground water pollution	1.00
	root restrictive layer	0.83	root restrictive layer	0.83
	available water capacity	0.73	available water capacity	0.73
	tilth	0.10	tilth	0.10
	erosion hazard	0.10	erosion hazard	0.10
EhC3:				
Eldean	Very limited		Very limited	
	ground water pollution	1.00	easily eroded	1.00
	easily eroded	1.00	tilth	1.00
	tilth	1.00	ground water pollution	1.00
	root restrictive layer	0.98	root restrictive layer	0.98
	available water capacity	0.84	available water capacity	0.84

TABLE 8.--Cropland Limitations and Hazards--Continued

Map symbol and soil name	Limitations for Corn and Soybeans: Rating class and limiting features	Value	Limitations for Wheat: Rating class and limiting features	Value
EhD3:				
Eldean	Very limited		Very limited	
	ground water pollution	1.00	tilth	1.00
	tilth	1.00	ground water pollution	1.00
	easily eroded	0.97	easily eroded	0.97
	available water capacity	0.27	available water capacity	0.27
	root restrictive layer	0.13	root restrictive layer	0.13
	clay content	0.03	clay content	0.03
EkA:				
Eldean	Very limited		Very limited	
	ground water pollution	1.00	ground water pollution	1.00
	root restrictive layer	0.09	root restrictive layer	0.09
	available water capacity	0.06	available water capacity	0.06
	clay content	0.01	clay content	0.01
EkB:				
Eldean	Very limited		Very limited	
	ground water pollution	1.00	ground water pollution	1.00
	erosion hazard	0.27	erosion hazard	0.27
	root restrictive layer	0.20	root restrictive layer	0.20
	available water capacity	0.17	available water capacity	0.17
	clay content	0.03	clay content	0.03
EkB2:				
Eldean	Very limited		Very limited	
	ground water pollution	1.00	ground water pollution	1.00
	root restrictive layer	0.34	root restrictive layer	0.34
	available water capacity	0.32	available water capacity	0.32
	erosion hazard	0.27	erosion hazard	0.27
	tilth	0.25	tilth	0.25
	clay content	0.03	clay content	0.03
FcA:				
Fincastle	Very limited		Very limited	
	seasonal high water table	1.00	frost action	1.00
	susceptible to compaction	0.50	seasonal high water table	1.00
	surface crusting	0.45	susceptible to compaction	0.50
			surface crusting	0.45

TABLE 8.--Cropland Limitations and Hazards--Continued

Map symbol and soil name	Limitations for Corn and Soybeans: Rating class and limiting features	Value	Limitations for Wheat: Rating class and limiting features	Value
FdA:				
Fincastle	Very limited		Very limited	
	seasonal high water table	1.00	frost action	1.00
	susceptible to compaction	0.50	seasonal high water table	1.00
	surface crusting	0.45	susceptible to compaction	0.50
			surface crusting	0.45
FmA:				
Fox	Somewhat limited		Somewhat limited	
	susceptible to compaction	0.50	susceptible to compaction	0.50
	surface crusting	0.45	surface crusting	0.45
	root restrictive layer	0.05	root restrictive layer	0.05
FmB:				
Fox	Somewhat limited		Somewhat limited	
	susceptible to compaction	0.50	susceptible to compaction	0.50
	surface crusting	0.45	surface crusting	0.45
	erosion hazard	0.27	erosion hazard	0.27
	root restrictive layer	0.05	root restrictive layer	0.05
FmB2:				
Fox	Very limited		Very limited	
	surface crusting	1.00	surface crusting	1.00
	susceptible to compaction	0.50	susceptible to compaction	0.50
	erosion hazard	0.27	erosion hazard	0.27
	tilth	0.25	tilth	0.25
	root restrictive layer	0.02	root restrictive layer	0.02
HeF2:				
Hennepin	Very limited		Very limited	
	root restrictive layer	1.00	root restrictive layer	1.00
	easily eroded	1.00	easily eroded	1.00
	slope	1.00	slope	1.00
	surface crusting	1.00	surface crusting	1.00
	susceptible to compaction	0.50	susceptible to compaction	0.50
	tilth	0.40	tilth	0.40
Miamian	Very limited		Very limited	
	easily eroded	1.00	easily eroded	1.00
	slope	1.00	slope	1.00
	surface crusting	1.00	surface crusting	1.00
	root restrictive layer	0.59	root restrictive layer	0.59
	susceptible to compaction	0.50	susceptible to compaction	0.50
	tilth	0.25	tilth	0.25

TABLE 8.--Cropland Limitations and Hazards--Continued

Map symbol and soil name	Limitations for Corn and Soybeans: Rating class and limiting features	Value	Limitations for Wheat: Rating class and limiting features	Value
HwE2:				
Hennepin	Very limited		Very limited	
	root restrictive layer	1.00	root restrictive layer	1.00
	easily eroded	1.00	easily eroded	1.00
	surface crusting	1.00	surface crusting	1.00
	susceptible to compaction	0.50	susceptible to compaction	0.50
	tilth	0.40	tilth	0.40
	slope	0.10	slope	0.10
Wynn	Very limited		Very limited	
	easily eroded	1.00	easily eroded	1.00
	surface crusting	1.00	surface crusting	1.00
	root restrictive layer	0.52	root restrictive layer	0.52
	susceptible to compaction	0.50	susceptible to compaction	0.50
	ground water pollution	0.50	ground water pollution	0.50
	tilth	0.25	tilth	0.25
	slope	0.10	slope	0.10
	available water capacity	0.03	available water capacity	0.03
HwF2:				
Hennepin	Very limited		Very limited	
	root restrictive layer	1.00	root restrictive layer	1.00
	easily eroded	1.00	easily eroded	1.00
	slope	1.00	slope	1.00
	surface crusting	1.00	surface crusting	1.00
	susceptible to compaction	0.50	susceptible to compaction	0.50
	tilth	0.40	tilth	0.40
Wynn	Very limited		Very limited	
	easily eroded	1.00	easily eroded	1.00
	slope	1.00	slope	1.00
	surface crusting	1.00	surface crusting	1.00
	root restrictive layer	0.92	root restrictive layer	0.92
	ground water pollution	0.68	ground water pollution	0.68
	susceptible to compaction	0.50	susceptible to compaction	0.50
	available water capacity	0.49	available water capacity	0.49
	tilth	0.25	tilth	0.25
KeC2:				
Kendallville	Very limited		Very limited	
	surface crusting	1.00	surface crusting	1.00
	easily eroded	0.98	easily eroded	0.98
	root restrictive layer	0.52	root restrictive layer	0.52
	susceptible to compaction	0.50	susceptible to compaction	0.50
	tilth	0.25	tilth	0.25

TABLE 8.--Cropland Limitations and Hazards--Continued

Map symbol and soil name	Limitations for Corn and Soybeans: Rating class and limiting features	Value	Limitations for Wheat: Rating class and limiting features	Value
Eldean	Very limited		Very limited	
	ground water pollution	1.00	ground water pollution	1.00
	surface crusting	1.00	surface crusting	1.00
	easily eroded	0.98	easily eroded	0.98
	root restrictive layer	0.83	root restrictive layer	0.83
	available water capacity	0.61	available water capacity	0.61
	susceptible to compaction	0.50	susceptible to compaction	0.50
	tilth	0.25	tilth	0.25
KeD2:				
Kendallville	Very limited		Very limited	
	surface crusting	1.00	surface crusting	1.00
	easily eroded	0.98	easily eroded	0.98
	susceptible to compaction	0.50	susceptible to compaction	0.50
	root restrictive layer	0.34	root restrictive layer	0.34
	tilth	0.25	tilth	0.25
Eldean	Very limited		Very limited	
	ground water pollution	1.00	ground water pollution	1.00
	surface crusting	1.00	surface crusting	1.00
	easily eroded	0.98	easily eroded	0.98
	susceptible to compaction	0.50	susceptible to compaction	0.50
	available water capacity	0.33	available water capacity	0.33
	tilth	0.25	tilth	0.25
	root restrictive layer	0.25	root restrictive layer	0.25
KnA:				
Kokomo	Very limited		Very limited	
	seasonal high water table	1.00	ponding	1.00
	ponding	1.00	frost action	1.00
	susceptible to compaction	0.50	seasonal high water table	1.00
	ground water pollution	0.50	susceptible to compaction	0.50
			ground water pollution	0.50
KoA:				
Kokomo	Very limited		Very limited	
	seasonal high water table	1.00	ponding	1.00
	ponding	1.00	frost action	1.00
	susceptible to compaction	0.50	seasonal high water table	1.00
	ground water pollution	0.50	susceptible to compaction	0.50
	tilth	0.28	ground water pollution	0.50
			tilth	0.28

TABLE 8.--Cropland Limitations and Hazards--Continued

Map symbol and soil name	Limitations for Corn and Soybeans: Rating class and limiting features	Value	Limitations for Wheat: Rating class and limiting features	Value
LeB:				
Lewisburg	Very limited		Very limited	
	seasonal high water table	1.00	root restrictive layer	1.00
	root restrictive layer	1.00	frost action	1.00
	easily eroded	0.72	seasonal high water table	1.00
	susceptible to compaction	0.50	easily eroded	0.72
	surface crusting	0.45	susceptible to compaction	0.50
			surface crusting	0.45
Celina	Very limited		Very limited	
	restricted permeability	1.00	frost action	1.00
	susceptible to compaction	0.50	restricted permeability	1.00
	surface crusting	0.45	susceptible to compaction	0.50
	erosion hazard	0.27	surface crusting	0.45
	root restrictive layer	0.20	erosion hazard	0.27
			root restrictive layer	0.20
LfB2:				
Lewisburg	Very limited		Very limited	
	seasonal high water table	1.00	root restrictive layer	1.00
	root restrictive layer	1.00	frost action	1.00
	surface crusting	1.00	surface crusting	1.00
	susceptible to compaction	1.00	susceptible to compaction	1.00
	easily eroded	0.72	seasonal high water table	1.00
	tilth	0.25	easily eroded	0.72
			tilth	0.25
Celina	Very limited		Very limited	
	surface crusting	1.00	frost action	1.00
	susceptible to compaction	1.00	surface crusting	1.00
	restricted permeability	1.00	susceptible to compaction	1.00
	root restrictive layer	0.52	restricted permeability	1.00
	tilth	0.25	root restrictive layer	0.52
	erosion hazard	0.14	tilth	0.25
			erosion hazard	0.14

TABLE 8.--Cropland Limitations and Hazards--Continued

Map symbol and soil name	Limitations for Corn and Soybeans: Rating class and limiting features	Value	Limitations for Wheat: Rating class and limiting features	Value
LgC3:				
Lewisburg	Very limited		Very limited	
	seasonal high water table	1.00	root restrictive layer	1.00
	root restrictive layer	1.00	frost action	1.00
	tilth	1.00	tilth	1.00
	susceptible to compaction	1.00	susceptible to compaction	1.00
	surface crusting	1.00	surface crusting	1.00
	easily eroded	0.96	seasonal high water table	1.00
			easily eroded	0.96
LpA:				
Lippincott	Very limited		Very limited	
	seasonal high water table	1.00	ponding	1.00
	ground water pollution	1.00	frost action	1.00
	ponding	1.00	ground water pollution	1.00
	susceptible to compaction	0.50	seasonal high water table	1.00
	tilth	0.39	susceptible to compaction	0.50
	root restrictive layer	0.09	tilth	0.39
	available water capacity	0.01	root restrictive layer	0.09
			available water capacity	0.01
MaA:				
Medway	Very limited		Very limited	
	flooding	1.00	frost action	1.00
	ground water pollution	0.75	flooding	1.00
	susceptible to compaction	0.50	ground water pollution	0.75
			susceptible to compaction	0.50
MbB2:				
Miami	Very limited		Very limited	
	surface crusting	1.00	surface crusting	1.00
	tilth	0.60	tilth	0.60
	root restrictive layer	0.52	root restrictive layer	0.52
	susceptible to compaction	0.50	susceptible to compaction	0.50
	erosion hazard	0.32	erosion hazard	0.32
	available water capacity	0.20	available water capacity	0.20

TABLE 8.--Cropland Limitations and Hazards--Continued

Map symbol and soil name	Limitations for Corn and Soybeans: Rating class and limiting features	Value	Limitations for Wheat: Rating class and limiting features	Value
McE2:				
Miami	Very limited		Very limited	
	easily eroded	1.00	easily eroded	1.00
	surface crusting	1.00	surface crusting	1.00
	tilth	0.60	tilth	0.60
	susceptible to compaction	0.50	susceptible to compaction	0.50
	root restrictive layer	0.41	root restrictive layer	0.41
	available water capacity	0.16	available water capacity	0.16
	slope	0.10	slope	0.10
Kendallville	Very limited		Very limited	
	easily eroded	1.00	easily eroded	1.00
	susceptible to compaction	0.50	susceptible to compaction	0.50
	surface crusting	0.45	surface crusting	0.45
	root restrictive layer	0.41	root restrictive layer	0.41
	tilth	0.25	tilth	0.25
	slope	0.10	slope	0.10
McF2:				
Miami	Very limited		Very limited	
	easily eroded	1.00	easily eroded	1.00
	slope	1.00	slope	1.00
	surface crusting	1.00	surface crusting	1.00
	root restrictive layer	0.69	root restrictive layer	0.69
	tilth	0.60	tilth	0.60
	susceptible to compaction	0.50	susceptible to compaction	0.50
	available water capacity	0.23	available water capacity	0.23
Kendallville	Very limited		Very limited	
	easily eroded	1.00	easily eroded	1.00
	slope	1.00	slope	1.00
	susceptible to compaction	0.50	susceptible to compaction	0.50
	surface crusting	0.45	surface crusting	0.45
	tilth	0.25	tilth	0.25
MdC2:				
Miami	Very limited		Very limited	
	tilth	1.00	tilth	1.00
	easily eroded	0.98	easily eroded	0.98
	root restrictive layer	0.83	root restrictive layer	0.83
	available water capacity	0.44	available water capacity	0.44
MdD2:				
Miami	Very limited		Very limited	
	tilth	1.00	tilth	1.00
	easily eroded	0.98	easily eroded	0.98
	root restrictive layer	0.52	root restrictive layer	0.52
	available water capacity	0.19	available water capacity	0.19

TABLE 8.--Cropland Limitations and Hazards--Continued

Map symbol and soil name	Limitations for Corn and Soybeans: Rating class and limiting features	Value	Limitations for Wheat: Rating class and limiting features	Value
MeC:				
Miamian	Very limited		Very limited	
	easily eroded	0.98	easily eroded	0.98
	root restrictive layer	0.92	root restrictive layer	0.92
	susceptible to compaction	0.50	susceptible to compaction	0.50
	surface crusting	0.45	surface crusting	0.45
MeC2:				
Miamian	Very limited		Very limited	
	surface crusting	1.00	surface crusting	1.00
	easily eroded	0.98	easily eroded	0.98
	root restrictive layer	0.59	root restrictive layer	0.59
	susceptible to compaction	0.50	susceptible to compaction	0.50
	tilth	0.25	tilth	0.25
MeD2:				
Miamian	Very limited		Very limited	
	surface crusting	1.00	surface crusting	1.00
	easily eroded	0.98	easily eroded	0.98
	root restrictive layer	0.75	root restrictive layer	0.75
	susceptible to compaction	0.50	susceptible to compaction	0.50
	tilth	0.25	tilth	0.25
MfB:				
Miamian	Somewhat limited		Somewhat limited	
	susceptible to compaction	0.50	susceptible to compaction	0.50
	surface crusting	0.45	surface crusting	0.45
	erosion hazard	0.27	erosion hazard	0.27
	root restrictive layer	0.13	root restrictive layer	0.13
Celina	Very limited		Very limited	
	restricted permeability	1.00	frost action	1.00
	susceptible to compaction	0.50	restricted permeability	1.00
	surface crusting	0.45	susceptible to compaction	0.50
	erosion hazard	0.27	surface crusting	0.45
	root restrictive layer	0.20	erosion hazard	0.27
			root restrictive layer	0.20
MfB2:				
Miamian	Very limited		Very limited	
	surface crusting	1.00	surface crusting	1.00
	susceptible to compaction	0.50	susceptible to compaction	0.50
	erosion hazard	0.27	erosion hazard	0.27
	tilth	0.25	tilth	0.25
	root restrictive layer	0.09	root restrictive layer	0.09

TABLE 8.--Cropland Limitations and Hazards--Continued

Map symbol and soil name	Limitations for Corn and Soybeans: Rating class and limiting features	Value	Limitations for Wheat: Rating class and limiting features	Value
Celina	Very limited		Very limited	
	surface crusting	1.00	frost action	1.00
	restricted permeability	1.00	surface crusting	1.00
	susceptible to compaction	0.50	restricted permeability	1.00
	erosion hazard	0.27	susceptible to compaction	0.50
	tilth	0.25	erosion hazard	0.27
	root restrictive layer	0.25	tilth	0.25
			root restrictive layer	0.25
MgE2:				
Miamian	Very limited		Very limited	
	easily eroded	1.00	easily eroded	1.00
	surface crusting	1.00	surface crusting	1.00
	susceptible to compaction	0.50	susceptible to compaction	0.50
	tilth	0.25	tilth	0.25
	slope	0.10	slope	0.10
	root restrictive layer	0.02	root restrictive layer	0.02
Kendallville	Very limited		Very limited	
	easily eroded	1.00	easily eroded	1.00
	surface crusting	1.00	surface crusting	1.00
	root restrictive layer	0.59	root restrictive layer	0.59
	susceptible to compaction	0.50	susceptible to compaction	0.50
	tilth	0.25	tilth	0.25
	slope	0.10	slope	0.10
MgF2:				
Miamian	Very limited		Very limited	
	easily eroded	1.00	easily eroded	1.00
	slope	1.00	slope	1.00
	surface crusting	1.00	surface crusting	1.00
	root restrictive layer	0.69	root restrictive layer	0.69
	susceptible to compaction	0.50	susceptible to compaction	0.50
	tilth	0.25	tilth	0.25
Kendallville	Very limited		Very limited	
	easily eroded	1.00	easily eroded	1.00
	slope	1.00	slope	1.00
	surface crusting	1.00	surface crusting	1.00
	susceptible to compaction	0.50	susceptible to compaction	0.50
	tilth	0.25	tilth	0.25
	root restrictive layer	0.13	root restrictive layer	0.13

TABLE 8.--Cropland Limitations and Hazards--Continued

Map symbol and soil name	Limitations for Corn and Soybeans: Rating class and limiting features	Value	Limitations for Wheat: Rating class and limiting features	Value
MhC3:				
Miamian	Very limited		Very limited	
	easily eroded	1.00	easily eroded	1.00
	tilth	1.00	tilth	1.00
	susceptible to compaction	1.00	susceptible to compaction	1.00
	surface crusting	1.00	surface crusting	1.00
	root restrictive layer	0.83	root restrictive layer	0.83
Losantville	Very limited		Very limited	
	seasonal high water table	1.00	root restrictive layer	1.00
	root restrictive layer	1.00	easily eroded	1.00
	easily eroded	1.00	tilth	1.00
	tilth	1.00	susceptible to compaction	1.00
	susceptible to compaction	1.00	surface crusting	1.00
	surface crusting	1.00	seasonal high water table	1.00
	available water capacity	0.91	available water capacity	0.91
	ground water pollution	0.50	ground water pollution	0.50
MhD3:				
Miamian	Very limited		Very limited	
	tilth	1.00	tilth	1.00
	susceptible to compaction	1.00	susceptible to compaction	1.00
	surface crusting	1.00	surface crusting	1.00
	easily eroded	0.96	easily eroded	0.96
	root restrictive layer	0.25	root restrictive layer	0.25
Losantville	Very limited		Very limited	
	seasonal high water table	1.00	root restrictive layer	1.00
	root restrictive layer	1.00	tilth	1.00
	tilth	1.00	susceptible to compaction	1.00
	susceptible to compaction	1.00	surface crusting	1.00
	surface crusting	1.00	seasonal high water table	1.00
	available water capacity	0.99	available water capacity	0.99
	easily eroded	0.96	easily eroded	0.96
	ground water pollution	0.50	ground water pollution	0.50
MmE2:				
Miamian	Very limited		Very limited	
	easily eroded	1.00	easily eroded	1.00
	surface crusting	1.00	surface crusting	1.00
	root restrictive layer	0.83	root restrictive layer	0.83
	susceptible to compaction	0.50	susceptible to compaction	0.50
	tilth	0.25	tilth	0.25
	slope	0.10	slope	0.10

TABLE 8.--Cropland Limitations and Hazards--Continued

Map symbol and soil name	Limitations for Corn and Soybeans: Rating class and limiting features	Value	Limitations for Wheat: Rating class and limiting features	Value
Hennepin	Very limited		Very limited	
	root restrictive layer	1.00	root restrictive layer	1.00
	easily eroded	1.00	easily eroded	1.00
	surface crusting	1.00	surface crusting	1.00
	susceptible to compaction	0.50	susceptible to compaction	0.50
	tilth	0.40	tilth	0.40
	slope	0.10	slope	0.10
MnE3:				
Miamian	Very limited		Very limited	
	easily eroded	1.00	easily eroded	1.00
	tilth	1.00	tilth	1.00
	susceptible to compaction	1.00	susceptible to compaction	1.00
	surface crusting	1.00	surface crusting	1.00
	root restrictive layer	0.83	root restrictive layer	0.83
	slope	0.10	slope	0.10
Hennepin	Very limited		Very limited	
	root restrictive layer	1.00	root restrictive layer	1.00
	easily eroded	1.00	easily eroded	1.00
	tilth	1.00	tilth	1.00
	susceptible to compaction	1.00	susceptible to compaction	1.00
	surface crusting	1.00	surface crusting	1.00
	slope	0.10	slope	0.10
MpA:				
Milford	Very limited		Very limited	
	seasonal high water table	1.00	ponding	1.00
	tilth	1.00	frost action	1.00
	ponding	1.00	tilth	1.00
	susceptible to compaction	0.50	seasonal high water table	1.00
	ground water pollution	0.50	susceptible to compaction	0.50
	clay content	0.01	ground water pollution	0.50
			clay content	0.01
MrA:				
Milford	Very limited		Very limited	
	seasonal high water table	1.00	ponding	1.00
	tilth	1.00	frost action	1.00
	ponding	1.00	tilth	1.00
	susceptible to compaction	0.50	seasonal high water table	1.00
	ground water pollution	0.50	susceptible to compaction	0.50
	clay content	0.01	ground water pollution	0.50
			clay content	0.01

TABLE 8.--Cropland Limitations and Hazards--Continued

Map symbol and soil name	Limitations for Corn and Soybeans: Rating class and limiting features	Value	Limitations for Wheat: Rating class and limiting features	Value
MsA:				
Millsdale	Very limited		Very limited	
	seasonal high water table	1.00	ponding	1.00
	ponding	1.00	frost action	1.00
	root restrictive layer	0.87	seasonal high water table	1.00
	ground water pollution	0.65	root restrictive layer	0.87
	available water capacity	0.51	ground water pollution	0.65
	susceptible to compaction	0.50	available water capacity	0.51
	clay content	0.01	susceptible to compaction	0.50
			clay content	0.01
MtA:				
Millsdale	Very limited		Very limited	
	seasonal high water table	1.00	ponding	1.00
	ponding	1.00	frost action	1.00
	root restrictive layer	0.52	seasonal high water table	1.00
	susceptible to compaction	0.50	root restrictive layer	0.52
	ground water pollution	0.50	susceptible to compaction	0.50
	tilth	0.25	ground water pollution	0.50
	available water capacity	0.21	tilth	0.25
	clay content	0.01	available water capacity	0.21
			clay content	0.01
MuA:				
Milton	Somewhat limited		Somewhat limited	
	susceptible to compaction	0.50	susceptible to compaction	0.50
	ground water pollution	0.46	ground water pollution	0.46
	surface crusting	0.45	surface crusting	0.45
	root restrictive layer	0.41	root restrictive layer	0.41
	available water capacity	0.14	available water capacity	0.14
MuB:				
Milton	Somewhat limited		Somewhat limited	
	root restrictive layer	0.69	root restrictive layer	0.69
	ground water pollution	0.56	ground water pollution	0.56
	susceptible to compaction	0.50	susceptible to compaction	0.50
	surface crusting	0.45	surface crusting	0.45
	available water capacity	0.36	available water capacity	0.36
	erosion hazard	0.27	erosion hazard	0.27

TABLE 8.--Cropland Limitations and Hazards--Continued

Map symbol and soil name	Limitations for Corn and Soybeans: Rating class and limiting features	Value	Limitations for Wheat: Rating class and limiting features	Value
MuB2:				
Milton	Very limited		Very limited	
	surface crusting	1.00	surface crusting	1.00
	root restrictive layer	0.69	root restrictive layer	0.69
	ground water pollution	0.56	ground water pollution	0.56
	available water capacity	0.53	available water capacity	0.53
	susceptible to compaction	0.50	susceptible to compaction	0.50
	erosion hazard	0.27	erosion hazard	0.27
	tilth	0.25	tilth	0.25
MuC2:				
Milton	Very limited		Very limited	
	surface crusting	1.00	surface crusting	1.00
	easily eroded	0.98	easily eroded	0.98
	root restrictive layer	0.69	root restrictive layer	0.69
	available water capacity	0.60	available water capacity	0.60
	ground water pollution	0.56	ground water pollution	0.56
	susceptible to compaction	0.50	susceptible to compaction	0.50
	tilth	0.25	tilth	0.25
MuD2:				
Milton	Very limited		Very limited	
	surface crusting	1.00	surface crusting	1.00
	easily eroded	0.98	easily eroded	0.98
	root restrictive layer	0.59	root restrictive layer	0.59
	ground water pollution	0.53	ground water pollution	0.53
	susceptible to compaction	0.50	susceptible to compaction	0.50
	available water capacity	0.42	available water capacity	0.42
	tilth	0.25	tilth	0.25
MuE2:				
Milton	Very limited		Very limited	
	easily eroded	1.00	easily eroded	1.00
	surface crusting	1.00	surface crusting	1.00
	root restrictive layer	0.96	root restrictive layer	0.96
	available water capacity	0.92	available water capacity	0.92
	ground water pollution	0.71	ground water pollution	0.71
	susceptible to compaction	0.50	susceptible to compaction	0.50
	tilth	0.25	tilth	0.25
	slope	0.10	slope	0.10
	clay content	0.02	clay content	0.02

TABLE 8.--Cropland Limitations and Hazards--Continued

Map symbol and soil name	Limitations for Corn and Soybeans: Rating class and limiting features	Value	Limitations for Wheat: Rating class and limiting features	Value
MwA:				
Morningsun	Somewhat limited		Very limited	
	susceptible to compaction	0.50	frost action	1.00
	ground water pollution	0.50	susceptible to compaction	0.50
	surface crusting	0.45	ground water pollution	0.50
			surface crusting	0.45
MxA:				
Morningsun	Somewhat limited		Very limited	
	susceptible to compaction	0.50	frost action	1.00
	ground water pollution	0.50	susceptible to compaction	0.50
	surface crusting	0.45	ground water pollution	0.50
			surface crusting	0.45
Xenia	Somewhat limited		Very limited	
	susceptible to compaction	0.50	frost action	1.00
	surface crusting	0.45	susceptible to compaction	0.50
			surface crusting	0.45
MxB:				
Morningsun	Somewhat limited		Very limited	
	susceptible to compaction	0.50	frost action	1.00
	ground water pollution	0.50	susceptible to compaction	0.50
	surface crusting	0.45	ground water pollution	0.50
	erosion hazard	0.27	surface crusting	0.45
			erosion hazard	0.27
Xenia	Somewhat limited		Very limited	
	susceptible to compaction	0.50	frost action	1.00
	surface crusting	0.45	susceptible to compaction	0.50
	erosion hazard	0.27	surface crusting	0.45
			erosion hazard	0.27
MxB2:				
Morningsun	Very limited		Very limited	
	surface crusting	1.00	frost action	1.00
	susceptible to compaction	0.50	surface crusting	1.00
	ground water pollution	0.50	susceptible to compaction	0.50
	erosion hazard	0.27	ground water pollution	0.50
	tilth	0.25	erosion hazard	0.27
			tilth	0.25

TABLE 8.--Cropland Limitations and Hazards--Continued

Map symbol and soil name	Limitations for Corn and Soybeans: Rating class and limiting features	Value	Limitations for Wheat: Rating class and limiting features	Value
Xenia	Very limited		Very limited	
	surface crusting	1.00	frost action	1.00
	susceptible to compaction	0.50	surface crusting	1.00
	erosion hazard	0.27	susceptible to compaction	0.50
	tilth	0.25	erosion hazard	0.27
			tilth	0.25
MyA:				
Mahalasville	Very limited		Very limited	
	seasonal high water table	1.00	ponding	1.00
	ponding	1.00	frost action	1.00
	ground water pollution	0.75	seasonal high water table	1.00
	susceptible to compaction	0.50	ground water pollution	0.75
			susceptible to compaction	0.50
OcA:				
Ockley	Very limited		Very limited	
	ground water pollution	1.00	ground water pollution	1.00
	surface crusting	0.70	surface crusting	0.70
	susceptible to compaction	0.50	susceptible to compaction	0.50
	tilth	0.04	tilth	0.04
	available water capacity	0.01	available water capacity	0.01
OcB:				
Ockley	Very limited		Very limited	
	ground water pollution	1.00	ground water pollution	1.00
	surface crusting	0.70	surface crusting	0.70
	susceptible to compaction	0.50	susceptible to compaction	0.50
	erosion hazard	0.27	erosion hazard	0.27
	tilth	0.04	tilth	0.04
	available water capacity	0.01	available water capacity	0.01
Pg:				
Pits, gravel	Not Rated		Not Rated	
Pq:				
Pits, quarry	Not Rated		Not Rated	
PtB:				
Plattville	Somewhat limited		Somewhat limited	
	susceptible to compaction	0.50	susceptible to compaction	0.50
	ground water pollution	0.50	ground water pollution	0.50
	erosion hazard	0.14	erosion hazard	0.14
	surface crusting	0.01	surface crusting	0.01

TABLE 8.--Cropland Limitations and Hazards--Continued

Map symbol and soil name	Limitations for Corn and Soybeans: Rating class and limiting features	Value	Limitations for Wheat: Rating class and limiting features	Value
RaA:				
Rainsville	Somewhat limited		Somewhat limited	
	susceptible to compaction	0.50	susceptible to compaction	0.50
	surface crusting	0.45	surface crusting	0.45
RaB:				
Rainsville	Very limited		Very limited	
	easily eroded	0.80	easily eroded	0.80
	susceptible to compaction	0.50	susceptible to compaction	0.50
	surface crusting	0.45	surface crusting	0.45
RaB2:				
Rainsville	Very limited		Very limited	
	surface crusting	1.00	surface crusting	1.00
	easily eroded	0.80	easily eroded	0.80
	susceptible to compaction	0.50	susceptible to compaction	0.50
	tilth	0.25	tilth	0.25
RcA:				
Randolph	Very limited		Very limited	
	seasonal high water table	1.00	frost action	1.00
	susceptible to compaction	0.50	seasonal high water table	1.00
	ground water pollution	0.50	susceptible to compaction	0.50
	surface crusting	0.45	ground water pollution	0.50
	root restrictive layer	0.25	surface crusting	0.45
	available water capacity	0.21	root restrictive layer	0.25
	clay content	0.04	available water capacity	0.21
			clay content	0.04
RcB:				
Randolph	Very limited		Very limited	
	seasonal high water table	1.00	frost action	1.00
	susceptible to compaction	0.50	seasonal high water table	1.00
	ground water pollution	0.50	susceptible to compaction	0.50
	available water capacity	0.48	ground water pollution	0.50
	surface crusting	0.45	available water capacity	0.48
	root restrictive layer	0.34	surface crusting	0.45
	erosion hazard	0.27	root restrictive layer	0.34
	clay content	0.04	erosion hazard	0.27
			clay content	0.04

TABLE 8.--Cropland Limitations and Hazards--Continued

Map symbol and soil name	Limitations for Corn and Soybeans: Rating class and limiting features	Value	Limitations for Wheat: Rating class and limiting features	Value
RnE2:				
Rodman	Very limited		Very limited	
	ground water pollution	1.00	ground water pollution	1.00
	available water capacity	1.00	available water capacity	1.00
	easily eroded	0.96	easily eroded	0.96
	slope	0.10	slope	0.10
RnF2:				
Rodman	Very limited		Very limited	
	ground water pollution	1.00	easily eroded	1.00
	easily eroded	1.00	ground water pollution	1.00
	available water capacity	1.00	available water capacity	1.00
	slope	1.00	slope	1.00
RoE2:				
Rodman	Very limited		Very limited	
	ground water pollution	1.00	ground water pollution	1.00
	available water capacity	1.00	available water capacity	1.00
	easily eroded	0.96	easily eroded	0.96
	slope	0.10	slope	
Kendallville	Very limited		Very limited	
	easily eroded	1.00	easily eroded	1.00
	tilth	0.25	tilth	0.25
	slope	0.10	slope	0.10
RoF2:				
Rodman	Very limited		Very limited	
	ground water pollution	1.00	easily eroded	1.00
	easily eroded	1.00	ground water pollution	1.00
	available water capacity	1.00	available water capacity	1.00
	slope	1.00	slope	1.00
Kendallville	Very limited		Very limited	
	easily eroded	1.00	easily eroded	1.00
	slope	1.00	slope	1.00
	tilth	0.25	tilth	0.25
RpA:				
Rossburg	Very limited		Very limited	
	ground water pollution	1.00	ground water pollution	1.00
	flooding	1.00	flooding	1.00
	susceptible to compaction	0.50	susceptible to compaction	0.50

TABLE 8.--Cropland Limitations and Hazards--Continued

Map symbol and soil name	Limitations for Corn and Soybeans: Rating class and limiting features	Value	Limitations for Wheat: Rating class and limiting features	Value
RuB:				
Russell	Very limited		Very limited	
	surface crusting	1.00	frost action	1.00
	susceptible to compaction	0.50	surface crusting	1.00
	tilth	0.40	susceptible to compaction	0.50
	erosion hazard	0.27	tilth	0.40
			erosion hazard	0.27
Miamian	Somewhat limited		Somewhat limited	
	susceptible to compaction	0.50	susceptible to compaction	0.50
	surface crusting	0.45	surface crusting	0.45
	root restrictive layer	0.34	root restrictive layer	0.34
	erosion hazard	0.27	erosion hazard	0.27
RuB2:				
Russell	Very limited		Very limited	
	surface crusting	1.00	frost action	1.00
	tilth	1.00	surface crusting	1.00
	susceptible to compaction	0.50	tilth	1.00
	erosion hazard	0.27	susceptible to compaction	0.50
			erosion hazard	0.27
Miamian	Very limited		Very limited	
	surface crusting	1.00	surface crusting	1.00
	susceptible to compaction	0.50	susceptible to compaction	0.50
	erosion hazard	0.27	erosion hazard	0.27
	tilth	0.25	tilth	0.25
	root restrictive layer	0.25	root restrictive layer	0.25
SeA:				
Savona	Very limited		Very limited	
	seasonal high water table	1.00	frost action	1.00
	ground water pollution	1.00	ground water pollution	1.00
	surface crusting	0.70	seasonal high water table	1.00
	susceptible to compaction	0.50	surface crusting	0.70
	tilth	0.04	susceptible to compaction	0.50
			tilth	0.04

TABLE 8.--Cropland Limitations and Hazards--Continued

Map symbol and soil name	Limitations for Corn and Soybeans: Rating class and limiting features	Value	Limitations for Wheat: Rating class and limiting features	Value
SnA:				
Sloan	Very limited		Very limited	
	seasonal high water table	1.00	ponding	1.00
	ground water pollution	1.00	frost action	1.00
	ponding	1.00	ground water pollution	1.00
	flooding	1.00	seasonal high water table	1.00
	susceptible to compaction	0.50	flooding	1.00
			susceptible to compaction	0.50
StA:				
Stonelick	Very limited		Very limited	
	ground water pollution	1.00	ground water pollution	1.00
	flooding	1.00	flooding	1.00
	tilth	0.40	tilth	0.40
SvA:				
Sugarvalley	Very limited		Very limited	
	seasonal high water table	1.00	frost action	1.00
	susceptible to compaction	0.50	seasonal high water table	1.00
	ground water pollution	0.50	susceptible to compaction	0.50
	surface crusting	0.45	ground water pollution	0.50
			surface crusting	0.45
SwA:				
Sugarvalley	Very limited		Very limited	
	seasonal high water table	1.00	frost action	1.00
	susceptible to compaction	0.50	seasonal high water table	1.00
	ground water pollution	0.50	susceptible to compaction	0.50
	surface crusting	0.45	ground water pollution	0.50
			surface crusting	0.45
Fincastle	Very limited		Very limited	
	seasonal high water table	1.00	frost action	1.00
	susceptible to compaction	0.50	seasonal high water table	1.00
	surface crusting	0.45	susceptible to compaction	0.50
			surface crusting	0.45

TABLE 8.--Cropland Limitations and Hazards--Continued

Map symbol and soil name	Limitations for Corn and Soybeans: Rating class and limiting features	Value	Limitations for Wheat: Rating class and limiting features	Value
ThA:				
Thackery	Very limited		Very limited	
	seasonal high water table	1.00	frost action	1.00
	ground water pollution	1.00	ground water pollution	1.00
	susceptible to compaction	0.50	seasonal high water table	1.00
	surface crusting	0.45	susceptible to compaction	0.50
			surface crusting	0.45
ThB:				
Thackery	Very limited		Very limited	
	ground water pollution	1.00	frost action	1.00
	susceptible to compaction	0.50	ground water pollution	1.00
	surface crusting	0.45	susceptible to compaction	0.50
	erosion hazard	0.27	surface crusting	0.45
			erosion hazard	0.27
Ud:				
Udorthents	Not Rated		Not Rated	
W:				
Water	Not Rated		Not Rated	
WbA:				
Warsaw	Very limited		Very limited	
	ground water pollution	1.00	ground water pollution	1.00
	root restrictive layer	0.52	root restrictive layer	0.52
WnA:				
Westland	Very limited		Very limited	
	seasonal high water table	1.00	ponding	1.00
	ground water pollution	1.00	frost action	1.00
	ponding	1.00	ground water pollution	1.00
	susceptible to compaction	0.50	seasonal high water table	1.00
			susceptible to compaction	0.50
WyB:				
Wynn	Somewhat limited		Somewhat limited	
	susceptible to compaction	0.50	susceptible to compaction	0.50
	ground water pollution	0.46	ground water pollution	0.46
	surface crusting	0.45	surface crusting	0.45
	root restrictive layer	0.41	root restrictive layer	0.41
	erosion hazard	0.27	erosion hazard	0.27
	available water capacity	0.11	available water capacity	0.11

TABLE 8.--Cropland Limitations and Hazards--Continued

Map symbol and soil name	Limitations for Corn and Soybeans: Rating class and limiting features	Value	Limitations for Wheat: Rating class and limiting features	Value
WyB2:				
Wynn	Very limited		Very limited	
	surface crusting	1.00	surface crusting	1.00
	root restrictive layer	0.69	root restrictive layer	0.69
	ground water pollution	0.56	ground water pollution	0.56
	susceptible to compaction	0.50	susceptible to compaction	0.50
	erosion hazard	0.27	erosion hazard	0.27
	tilth	0.25	tilth	0.25
	available water capacity	0.14	available water capacity	0.14
WyC2:				
Wynn	Very limited		Very limited	
	surface crusting	1.00	surface crusting	1.00
	easily eroded	0.98	easily eroded	0.98
	root restrictive layer	0.96	root restrictive layer	0.96
	ground water pollution	0.71	ground water pollution	0.71
	available water capacity	0.59	available water capacity	0.59
	susceptible to compaction	0.50	susceptible to compaction	0.50
	tilth	0.25	tilth	0.25
WyD2:				
Wynn	Very limited		Very limited	
	surface crusting	1.00	surface crusting	1.00
	easily eroded	0.98	easily eroded	0.98
	root restrictive layer	0.69	root restrictive layer	0.69
	ground water pollution	0.56	ground water pollution	0.56
	susceptible to compaction	0.50	susceptible to compaction	0.50
	tilth	0.25	tilth	0.25
	available water capacity	0.12	available water capacity	0.12
XeA:				
Xenia	Somewhat limited		Very limited	
	susceptible to compaction	0.50	frost action	1.00
	surface crusting	0.45	susceptible to compaction	0.50
			surface crusting	0.45
XeB:				
Xenia	Somewhat limited		Very limited	
	susceptible to compaction	0.50	frost action	1.00
	surface crusting	0.45	susceptible to compaction	0.50
	erosion hazard	0.27	surface crusting	0.45
			erosion hazard	0.27

TABLE 8.--Cropland Limitations and Hazards--Continued

Map symbol and soil name	Limitations for Corn and Soybeans: Rating class and limiting features	Value	Limitations for Wheat: Rating class and limiting features	Value
XeB2:				
Xenia	Very limited		Very limited	
	surface crusting	1.00	frost action	1.00
	susceptible to compaction	0.50	surface crusting	1.00
	erosion hazard	0.27	susceptible to compaction	0.50
	tilth	0.25	erosion hazard	0.27
			tilth	0.25
XfB:				
Xenia	Somewhat limited		Very limited	
	susceptible to compaction	0.50	frost action	1.00
	surface crusting	0.45	susceptible to compaction	0.50
	erosion hazard	0.27	surface crusting	0.45
			erosion hazard	0.27

TABLE 9.--CROP YIELD INDEX

(This table is based on yields from the years 1992-2000. Estimated yields for soils with a yield index of 100 are: corn - 160 bushels; soybeans - 60 bushels; and wheat - 70 bushels. Refer to Crop Yield Index section in the text on page 195 for more information on how this table was developed, and instructions on converting yield index numbers to estimated yields. Absence of a yield index indicates that the soil is not suited to the crop or the crop is generally not grown on the soil.)

Map symbol and soil name	Corn	Soybeans	Winter Wheat
CeA: Celina	88	77	97
CeB: Celina	84	72	87
CeB2: Celina	80	67	79
CoA: Corwin	97	97	100
CtA: Crosby Celina	81	80	83
CtB: Crosby Celina	79	72	79
CvA: Crosby Lewisburg	81	80	83
CyA: Cyclone	100	100	93
DaA: Dana	91	83	91
DaB: Dana	88	75	91
EeA: Eel	86	78	---
EgA: Eldean	78	72	86
EgB: Eldean	70	65	77
EgB2: Eldean	62	57	69
EhC3: Eldean	46	43	51
EhD3: Eldean	39	37	43
EkA: Eldean	78	72	86
EkB: Eldean	70	65	77

TABLE 9.--CROP YIELD INDEX--Continued

Map symbol and soil name	Corn	Soybeans	Winter Wheat
EkB2:			
Eldean	62	58	57
FcA:			
Fincastle	91	82	93
FdA:			
Fincastle	91	82	93
FmA:			
Fox	72	67	80
FmB:			
Fox	65	60	71
FmB2:			
Fox	58	53	64
KeC2:			
Kendallville	56	52	63
Eldean			
KeD2:			
Kendallville	45	42	51
Eldean			
KnA:			
Kokomo	97	87	93
KoA:			
Kokomo	97	87	93
LeB:			
Lewisburg	68	63	76
Celina			
LfB2:			
Lewisburg	61	55	67
Celina			
LgC3:			
Lewisburg	45	42	50
LpA:			
Lippincott	83	77	86
MaA:			
Medway	95	87	---
MbB2:			
Miami	72	67	83
MdC2:			
Miami	62	57	69
MdD2:			
Miami	57	50	64
MeC:			
Miamian	66	62	74
MeC2:			
Miamian	62	57	69

TABLE 9.--CROP YIELD INDEX--Continued

Map symbol and soil name	Corn	Soybeans	Winter Wheat
MeD2:	54	48	60
Miamian			
MfB:	78	72	87
Miamian			
Celina			
MfB2:	70	63	77
Miamian			
Celina			
MhC3:	52	48	59
Miamian			
Losantville			
MhD3:	43	40	49
Miamian			
Losantville			
MpA:	90	83	86
Milford			
MrA:	90	83	86
Milford			
MsA:	86	78	79
Millsdale			
MtA:	83	77	79
Millsdale			
MuA:	88	70	86
Milton			
MuB:	77	63	77
Milton			
MuB2:	69	57	69
Milton			
MuC2:	54	48	60
Milton			
MuD2:	47	40	51
Milton			
MwA:	92	87	97
Morningsun			
MxA:	92	87	97
Morningsun			
Xenia			
MxB:	88	80	97
Morningsun			
Xenia			
MxB2:	84	73	93
Morningsun			
Xenia			
MyA:	90	83	86
Mahalasville			

TABLE 9.--CROP YIELD INDEX--Continued

Map symbol and soil name	Corn	Soybeans	Winter Wheat
OcA:	88	87	93
Ockley			
OcB:	86	83	93
Ockley			
PtB:	97	97	97
Plattville			
RaA:	84	78	94
Rainsville			
RaB:	81	75	89
Rainsville			
RaB2:	80	67	83
Rainsville			
RcA:	79	67	79
Randolph			
RcB:	71	60	71
Randolph			
RpA:	94	92	---
Rossburg			
RuB:	80	73	86
Russell			
Miamian			
RuB2:	74	70	79
Russell			
Miamian			
SeA:	88	77	80
Savona			
SnA:	80	73	---
Sloan			
StA:	74	68	---
Stonelick			
SvA:	91	82	93
Sugarvalley			
SwA:	91	82	93
Sugarvalley			
Fincastle			
ThA:	84	75	86
Thackery			
ThB:	84	72	83
Thackery			
WbA:	81	75	90
Warsaw			
WnA:	97	97	97
Westland			
WyB:	72	67	80
Wynn			

TABLE 9.--CROP YIELD INDEX--Continued

Map symbol and soil name	Corn	Soybeans	Winter Wheat
WyB2: Wynn	65	60	71
WyC2: Wynn	57	53	63
WyD2: Wynn	50	47	54
XeA: Xenia	92	87	97
XeB: Xenia	88	80	97
XeB2: Xenia	84	73	86
XfB: Xenia	88	80	97

TABLE 10.--ACREAGE BY CAPABILITY CLASSES AND SUBCLASSES

(See text on page 195 for additional information.)

Capability class	Capability subclass	Acreage
Unclassified	---	2070
1	---	14,037
2	e	103,923
	w	89,288
	s	2,914
3	e	20,587
	w	6,318
4	e	16,356
	w	256
6	e	9,864
7	e	6,685
	s	649

TABLE 11.--Pasture and Hayland Suitability Group and Yields per Acre of Pasture and Hayland

(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	Pasture and hayland suitability group	Kentucky bluegrass	Tall fesue	Orchardgrass - alfalfa hay	Orchardgrass - Red clover hay
		AUM	AUM	tons	tons
CeA:		3.6	5.6	5.4	4.5
Celina	A-6				
CeB:		3.6	5.6	5.4	4.5
Celina	A-6				
CeB2:		3.6	5.6	5.4	4.5
Celina	A-6				
CoA:		3.6	6.0	5.0	5.0
Corwin	A-1				
CtA:		3.6	5.6	5.4	4.5
Celina	A-6				
Crosby	C-1				
CtB:		3.6	5.6	5.4	4.5
Crosby	C-1				
Celina	A-6				
CvA:		3.6	5.6	5.4	4.5
Crosby	C-1				
Lewisburg	A-6				
CyA:		3.2	4.8	5.0	5.8
Cyclone	C-1				
DaA:		3.2	5.2	5.4	5.8
Dana	A-6				
DaB:		3.2	5.6	5.4	5.2
Dana	A-6				
EeA:		3.0	5.6	5.0	4.5
Eel	A-5				
EgA:		3.2	6.0	5.0	4.5
Eldean	B-1				
EgB:		3.2	5.5	5.0	4.5
Eldean	B-1				
EgB2:		3.2	5.0	5.0	4.0
Eldean	B-1				
EhC3:		2.5	4.0	3.0	3.0
Eldean	B-1				
EhD3:		2.5	3.0	2.5	2.5
Eldean	B-1				

Table 11.--Pasture and Hayland Suitability Group and Yields Per Acre of Pasture--Continued

Map symbol and soil name	Pasture and hayland suitability group	Kentucky bluegrass	Tall fesue	Orchardgrass - alfalfa hay	Orchardgrass - Red clover hay
		AUM	AUM	tons	tons
EkA:		3.2	4.5	5.0	5.0
Eldean	B-1				
EkB:		3.2	5.0	5.0	4.5
Eldean	B-1				
EkB2:		3.2	4.5	5.0	4.5
Eldean	B-1				
FcA:		3.2	4.5	5.0	5.5
Fincastle	C-1				
FdA:		3.2	4.5	5.0	5.5
Fincastle	C-1				
FmA:		3.2	5.5	5.0	4.5
Fox	A-1				
FmB:		3.2	5.0	5.0	4.5
Fox	A-1				
FmB2:		3.2	4.5	5.0	4.2
Fox	A-1				
HeF2:		1.0	2.0	2.0	2.0
Miamian	A-3				
Hennepin	A-3				
HwE2:		1.5	3.0	2.0	2.0
Hennepin	A-2				
Wynn	F-1				
HwF2:		1.0	2.0	2.0	2.0
Wynn	F-2				
Hennepin	A-3				
KeC2:		2.8	3.4	3.6	4.0
Kendallville	A-1				
Eldean	B-1				
KeD2:		2.5	3.0	3.0	3.2
Kendallville	A-1				
Eldean	B-1				
KnA:		3.2	4.0	5.0	5.8
Kokomo	C-1				
KoA:		3.2	4.0	5.0	5.8
Kokomo	C-1				
LeB:		2.8	3.2	4.0	4.0
Celina	A-6				
Lewisburg	A-6				
LfB2:		2.8	3.2	4.0	4.0
Lewisburg	A-6				
Celina	A-6				
LgC3:		2.0	2.8	3.0	2.3
Lewisburg	A-6				

Table 11.--Pasture and Hayland Suitability Group and Yields Per Acre of Pasture--Continued

Map symbol and soil name	Pasture and hayland suitability group	Kentucky bluegrass	Tall fesue	Orchardgrass - alfalfa hay	Orchardgrass - Red clover hay
		AUM	AUM	tons	tons
LpA:		3.2	3.2	5.5	5.0
Lippincott----------	C-1				
MaA:		3.0	3.2	5.0	5.8
Medway----------	A-5				
MbB2:		2.8	3.2	5.0	4.0
Miami----------	B-1				
McE2:		1.5	3.0	2.0	2.0
Kendallville--------	A-2				
Miami----------	B-1				
McF2:		1.0	2.0	2.0	2.0
Kendallville--------	A-3				
Miami----------	B-2				
MdC2:		2.8	3.2	5.0	4.0
Miami----------	B-1				
MdD2:		2.8	3.2	5.0	4.0
Miami----------	B-1				
MeC:		2.8	3.2	5.0	4.0
Miamian----------	A-1				
MeC2:		2.8	3.2	5.0	4.0
Miamian----------	A-1				
MeD2:		2.5	3.0	4.5	3.5
Miamian----------	A-1				
MfB:		2.8	3.2	5.0	4.0
Miamian----------	A-1				
Celina----------	A-6				
MfB2:		2.8	3.2	5.0	4.0
Celina----------	A-6				
Miamian----------	A-1				
MgE2:		1.5	3.0	2.0	2.0
Miamian----------	A-2				
Kendallville--------	A-2				
MgF2:		1.0	2.0	2.0	2.0
Miamian----------	A-3				
Kendallville--------	A-3				
MhC3:		2.5	2.8	4.0	3.5
Miamian----------	A-1				
Losantville---------	B-1				
MhD3:		2.3	2.2	3.0	3.0
Miamian----------	A-1				
Losantville---------	B-1				
MmE2:		1.5	3.0	2.0	2.0
Miamian----------	A-2				
Hennepin----------	A-2				
MnE3:		1.0	2.0	2.0	2.0
Miamian----------	A-2				
Hennepin----------	A-2				

Table 11.--Pasture and Hayland Suitability Group and Yields Per Acre of Pasture--Continued

Map symbol and soil name	Pasture and hayland suitability group	Kentucky bluegrass	Tall fesue	Orchardgrass - alfalfa hay	Orchardgrass - Red clover hay
		AUM	AUM	tons	tons
MpA:		2.8	3.2	5.0	4.0
Milford----------	C-1				
MrA:		2.8	3.2	5.0	4.0
Milford----------	C-1				
MsA:		2.8	2.5	5.0	4.0
Millsdale----------	C-2				
MtA:		2.5	2.5	5.0	4.0
Millsdale----------	C-2				
MpA:		2.8	3.2	5.0	4.0
Milford----------	C-1				
MrA:		2.8	3.2	5.0	4.0
Milford----------	C-1				
MsA:		2.8	2.5	5.0	4.0
Millsdale----------	C-2				
MtA:		2.5	2.5	5.0	4.0
Millsdale----------	C-2				
MuA:		2.8	3.2	5.0	4.0
Milton----------	F-1				
MuB:		2.8	3.2	5.0	4.0
Milton----------	F-1				
MuB2:		2.8	3.2	5.0	4.0
Milton----------	F-1				
MuC2:		2.8	3.2	5.0	4.0
Milton----------	F-1				
MuD2:		2.8	3.2	5.0	4.0
Milton----------	F-1				
MuE2:		1.5	3.0	2.0	2.0
Milton----------	F-1				
MwA:		3.8	4.5	5.8	6.0
Morningsun----------	A-6				
MxA:		3.8	4.5	5.8	6.0
Morningsun----------	A-6				
Xenia----------	A-6				
MxB:		3.8	4.5	5.8	6.0
Morningsun----------	A-6				
Xenia----------	A-6				
MxB2:		3.8	4.5	5.8	6.0
Morningsun----------	A-6				
Xenia----------	A-6				
MyA:		2.8	3.2	5.0	4.0
Mahalasville--------	C-1				
OcA:		3.8	4.5	5.8	6.0
Ockley----------	B-1				

Table 11.--Pasture and Hayland Suitability Group and Yields Per Acre of Pasture--Continued

Map symbol and soil name	Pasture and hayland suitability group	Kentucky bluegrass	Tall fesue	Orchardgrass - alfalfa hay	Orchardgrass - Red clover hay
		AUM	AUM	tons	tons
OcB:		3.8	4.5	5.8	6.0
Ockley	B-1				
PtB:		3.6	6.0	5.0	5.0
Plattville	A-1				
RaA:		3.8	4.5	5.8	6.0
Rainsville	A-1				
RaB:		3.8	4.5	5.8	6.0
Rainsville	A-1				
RaB2:		3.8	4.5	5.8	6.0
Rainsville	A-1				
RcA:		3.8	4.5	5.8	6.0
Randolph	C-2				
RcB:		3.8	4.5	5.8	6.0
Randolph	C-2				
RnE2:		1.5	3.0	2.0	2.0
Rodman	B-1				
RnF2:		1.0	2.0	2.0	2.0
Rodman	B-2				
RoE2:		1.5	3.0	2.0	2.0
Rodman	B-1				
Kendallville	A-2				
RoF2:		1.0	2.0	2.0	2.0
Rodman	B-2				
Kendallville	A-3				
RpA:		3.8	4.5	5.8	6.0
Rossburg	A-5				
RuB:		3.8	4.5	5.8	6.0
Miamian	A-1				
Russell	A-6				
RuB2:		3.8	4.5	5.8	6.0
Russell	A-6				
Miamian	A-1				
SeA:		3.8	3.5	4.5	5.0
Savona	C-1				
SnA:		3.8	4.5	5.8	6.0
Sloan	C-3				
StA:		3.8	4.5	5.8	6.0
Stonelick	A-5				
SvA:		3.8	4.5	5.8	6.0
Sugarvalley	C-1				
SwA:		3.8	4.5	5.8	6.0
Fincastle	C-1				
Sugarvalley	C-1				

Table 11.--Pasture and Hayland Suitability Group and Yields Per Acre of Pasture--Continued

Map symbol and soil name	Pasture and hayland suitability group	Kentucky bluegrass	Tall fesue	Orchardgrass - alfalfa hay	Orchardgrass - Red clover hay
		AUM	AUM	tons	tons
ThA: Thackery	A-6	3.8	4.5	5.8	6.0
ThB: Thackery	A-6	3.8	4.5	5.8	6.0
WbA: Warsaw	A-1	3.8	4.5	5.8	6.0
WnA: Westland	C-1	3.5	4.0	5.4	5.8
WyB: Wynn	F-1	3.0	4.0	4.5	5.0
WyB2: Wynn	F-1	3.0	4.0	4.5	5.0
WyC2: Wynn	F-1	3.0	4.0	4.5	5.0
WyD2: Wynn	F-1	3.0	4.0	4.5	5.0
XeA: Xenia	A-6	3.2	4.5	5.5	5.0
XeB: Xenia	A-6	3.2	4.5	5.5	5.0
XeB2: Xenia	A-6	3.2	4.5	5.5	5.0
XfB: Xenia	A-6	3.2	4.5	5.5	5.0

TABLE 12.--WOODLAND MANAGEMENT

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text on page 200 for further explanation of ratings in this table.)

Map symbol and soil name	Erosion hazard		Seedling mortality		Soil rutting hazard	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CeA:						
Celina	Slight Water erosion	0.02	Low		Severe Low strength	1.00
CeB:						
Celina	Slight Water erosion	0.10	Low		Severe Low strength	1.00
CeB2:						
Celina	Slight Water erosion	0.10	Low		Severe Low strength	1.00
CoA:						
Corwin	Slight Water erosion	0.02	Low		Severe Low strength	1.00
CtA:						
Crosby	Slight Water erosion	0.02	High Wetness	1.00	Severe Low strength	1.00
Celina	Slight Water erosion	0.02	Low		Severe Low strength	1.00
CtB:						
Crosby	Slight Water erosion	0.07	High Wetness	1.00	Severe Low strength	1.00
Celina	Slight Water erosion	0.07	Low		Severe Low strength	1.00
CvA:						
Crosby	Slight Water erosion	0.02	High Wetness	1.00	Severe Low strength	1.00
Lewisburg	Slight Water erosion	0.02	High Wetness	1.00	Severe Low strength	1.00
CyA:						
Cyclone	Slight Water erosion	0.01	High Wetness	1.00	Severe Low strength	1.00
DaA:						
Dana	Slight Water erosion	0.01	Low		Severe Low strength	1.00
DaB:						
Dana	Slight Water erosion	0.05	Low		Severe Low strength	1.00
EeA:						
Eel	Slight Water erosion	0.01	Low		Severe Low strength	1.00
EgA:						
Eldean	Slight Water erosion	0.01	Low		Severe Low strength	1.00

Table 12.--Woodland Management--Continued

Map symbol and soil name	Erosion hazard		Seedling mortality		Soil rutting hazard	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
EgB:						
Eldean	Slight		Low		Severe	
	Water erosion	0.05			Low strength	1.00
EgB2:						
Eldean	Slight		Low		Severe	
	Water erosion	0.05			Low strength	1.00
EhC3:						
Eldean	Slight		Low		Severe	
	Water erosion	0.13			Low strength	1.00
EhD3:						
Eldean	Moderate		Low		Severe	
	Water erosion	0.25			Low strength	1.00
EkA:						
Eldean	Slight		Low		Severe	
	Water erosion	0.02			Low strength	1.00
EkB:						
Eldean	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
EkB2:						
Eldean	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
FcA:						
Fincastle	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00
FdA:						
Fincastle	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00
FmA:						
Fox	Slight		Moderate		Severe	
	Water erosion	0.02	Carbonate content	0.50	Low strength	1.00
FmB:						
Fox	Slight		Moderate		Severe	
	Water erosion	0.10	Carbonate content	0.50	Low strength	1.00
FmB2:						
Fox	Slight		Moderate		Severe	
	Water erosion	0.10	Carbonate content	0.50	Low strength	1.00
HeF2:						
Hennepin	Severe		Moderate		Severe	
	Water erosion	0.68	Carbonate content	0.50	Low strength	1.00
Miamian	Severe		Low		Severe	
	Water erosion	0.93			Low strength	1.00
HwE2:						
Hennepin	Moderate		Moderate		Severe	
	Water erosion	0.36	Carbonate content	0.50	Low strength	1.00
Wynn	Moderate		Low		Severe	
	Water erosion	0.52			Low strength	1.00

Table 12.--Woodland Management--Continued

Map symbol and soil name	Erosion hazard		Seedling mortality		Soil rutting hazard	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HwF2:						
Hennepin	Severe		Moderate		Severe	
	Water erosion	0.68	Carbonate content	0.50	Low strength	1.00
Wynn	Severe		Low		Severe	
	Water erosion	0.93			Low strength	1.00
KeC2:						
Kendallville	Slight		Low		Severe	
	Water erosion	0.22			Low strength	1.00
Eldean	Slight		Moderate		Severe	
	Water erosion	0.22	Carbonate content	0.50	Low strength	1.00
KeD2:						
Kendallville	Moderate		Low		Severe	
	Water erosion	0.37			Low strength	1.00
Eldean	Moderate		Moderate		Severe	
	Water erosion	0.37	Carbonate content	0.50	Low strength	1.00
KnA:						
Kokomo	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
KoA:						
Kokomo	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
LeB:						
Lewisburg	Slight		High		Severe	
	Water erosion	0.10	Wetness	1.00	Low strength	1.00
Celina	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
LfB2:						
Lewisburg	Slight		High		Severe	
	Water erosion	0.10	Wetness	1.00	Low strength	1.00
Celina	Slight		Low		Severe	
	Water erosion	0.05			Low strength	1.00
LgC3:						
Lewisburg	Slight		High		Severe	
	Water erosion	0.22	Wetness	1.00	Low strength	1.00
LpA:						
Lippincott	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
MaA:						
Medway	Slight		Low		Severe	
	Water erosion	0.01			Low strength	1.00
MbB2:						
Miami	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
McE2:						
Miami	Moderate		Low		Severe	
	Water erosion	0.54			Low strength	1.00

Table 12.--Woodland Management--Continued

Map symbol and soil name	Erosion hazard		Seedling mortality		Soil rutting hazard	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Kendallville	Moderate Water erosion	0.54	Low		Severe Low strength	1.00
McF2:						
Miami	Severe Water erosion	0.91	Low		Severe Low strength	1.00
Kendallville	Severe Water erosion	0.91	Low		Severe Low strength	1.00
MdC2:						
Miami	Slight Water erosion	0.22	Low		Severe Low strength	1.00
MdD2:						
Miami	Moderate Water erosion	0.37	Low		Severe Low strength	1.00
MeC:						
Miamian	Slight Water erosion	0.22	Low		Severe Low strength	1.00
MeC2:						
Miamian	Slight Water erosion	0.22	Low		Severe Low strength	1.00
MeD2:						
Miamian	Moderate Water erosion	0.37	Low		Severe Low strength	1.00
MfB:						
Miamian	Slight Water erosion	0.10	Low		Severe Low strength	1.00
Celina	Slight Water erosion	0.10	Low		Severe Low strength	1.00
MfB2:						
Miamian	Slight Water erosion	0.10	Low		Severe Low strength	1.00
Celina	Slight Water erosion	0.10	Low		Severe Low strength	1.00
MgE2:						
Miamian	Moderate Water erosion	0.54	Low		Severe Low strength	1.00
Kendallville	Moderate Water erosion	0.54	Low		Severe Low strength	1.00
MgF2:						
Miamian	Severe Water erosion	0.91	Low		Severe Low strength	1.00
Kendallville	Severe Water erosion	0.91	Low		Severe Low strength	1.00
MhC3:						
Miamian	Slight Water erosion	0.13	Low		Severe Low strength	1.00
Losantville	Slight Water erosion	0.13	Low		Severe Low strength	1.00

Table 12.--Woodland Management--Continued

Map symbol and soil name	Erosion hazard		Seedling mortality		Soil rutting hazard	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MhD3:						
Miamian	Moderate Water erosion	0.25	Low		Severe Low strength	1.00
Losantville	Moderate Water erosion	0.25	Low		Severe Low strength	1.00
MmE2:						
Miamian	Moderate Water erosion	0.54	Low		Severe Low strength	1.00
Hennepin	Moderate Water erosion	0.37	Moderate Carbonate content	0.50	Severe Low strength	1.00
MnE3:						
Miamian	Moderate Water erosion	0.37	Low		Severe Low strength	1.00
Hennepin	Moderate Water erosion	0.37	Moderate Carbonate content	0.50	Severe Low strength	1.00
MpA:						
Milford	Slight Water erosion	0.01	High Wetness	1.00	Severe Low strength	1.00
MrA:						
Milford	Slight Water erosion	0.01	High Wetness	1.00	Severe Low strength	1.00
MsA:						
Millsdale	Slight Water erosion	0.01	High Wetness	1.00	Severe Low strength	1.00
MtA:						
Millsdale	Slight Water erosion	0.01	High Wetness	1.00	Severe Low strength	1.00
MuA:						
Milton	Slight Water erosion	0.02	Low		Severe Low strength	1.00
MuB:						
Milton	Slight Water erosion	0.10	Low		Severe Low strength	1.00
MuB2:						
Milton	Slight Water erosion	0.10	Low		Severe Low strength	1.00
MuC2:						
Milton	Slight Water erosion	0.22	Low		Severe Low strength	1.00
MuD2:						
Milton	Moderate Water erosion	0.37	Low		Severe Low strength	1.00
MuE2:						
Milton	Moderate Water erosion	0.52	Low		Severe Low strength	1.00
MwA:						
Morningsun	Slight Water erosion	0.02	Low		Severe Low strength	1.00

Table 12.--Woodland Management--Continued

Map symbol and soil name	Erosion hazard		Seedling mortality		Soil rutting hazard	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MxA:						
Morningsun	Slight		Low		Severe	
	Water erosion	0.02			Low strength	1.00
Xenia	Slight		Low		Severe	
	Water erosion	0.02			Low strength	1.00
MxB:						
Morningsun	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
Xenia	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
MxB2:						
Morningsun	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
Xenia	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
MyA:						
Mahalasville	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
OcA:						
Ockley	Slight		Low		Severe	
	Water erosion	0.02			Low strength	1.00
OcB:						
Ockley	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
Pg:						
Pits, Gravel	Not rated		Not rated		Not rated	
Pq:						
Pits, Quarry	Not rated		Not rated		Not rated	
PtB:						
Plattville	Slight		Low		Severe	
	Water erosion	0.05			Low strength	1.00
RaA:						
Rainsville	Slight		Low		Severe	
	Water erosion	0.02			Low strength	1.00
RaB:						
Rainsville	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
RaB2:						
Rainsville	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
RcA:						
Randolph	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00
RcB:						
Randolph	Slight		High		Severe	
	Water erosion	0.10	Wetness	1.00	Low strength	1.00

Table 12.--Woodland Management--Continued

Map symbol and soil name	Erosion hazard		Seedling mortality		Soil rutting hazard	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
RnE2:						
Rodman	Moderate		Moderate		Severe	
	Water erosion	0.36	Carbonate content	0.50	Low strength	1.00
			Soil reaction	0.50		
RnF2:						
Rodman	Severe		Moderate		Severe	
	Water erosion	0.66	Carbonate content	0.50	Low strength	1.00
			Soil reaction	0.50		
RoE2:						
Rodman	Moderate		Moderate		Severe	
	Water erosion	0.36	Carbonate content	0.50	Low strength	1.00
			Soil reaction	0.50		
Kendallville	Moderate		Low		Severe	
	Water erosion	0.52			Low strength	1.00
RoF2:						
Rodman	Severe		Moderate		Severe	
	Water erosion	0.66	Carbonate content	0.50	Low strength	1.00
			Soil reaction	0.50		
Kendallville	Severe		Low		Severe	
	Water erosion	0.91			Low strength	1.00
RpA:						
Rossburg	Slight		Low		Severe	
	Water erosion	0.01			Low strength	1.00
RuB:						
Russell	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
Miamian	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
RuB2:						
Russell	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
Miamian	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
SeA:						
Savona	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00
SnA:						
Sloan	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
StA:						
Stonelick	Slight		Moderate		Severe	
	Water erosion	0.01	Carbonate content	0.50	Low strength	1.00
			Soil reaction	0.50		
SvA:						
Sugarvalley	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00
SwA:						
Sugarvalley	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00

Table 12.--Woodland Management--Continued

Map symbol and soil name	Erosion hazard		Seedling mortality		Soil rutting hazard	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Fincastle	Slight Water erosion	0.02	High Wetness	1.00	Severe Low strength	1.00
ThA:						
Thackery	Slight Water erosion	0.02	Low		Severe Low strength	1.00
ThB:						
Thackery	Slight Water erosion	0.10	Low		Severe Low strength	1.00
Ud:						
Udorthents	Not rated		Not rated		Not rated	
W:						
Water	Not rated		Not rated		Not rated	
WbA:						
Warsaw	Slight Water erosion	0.01	Low		Severe Low strength	1.00
WnA:						
Westland	Slight Water erosion	0.01	High Wetness	1.00	Severe Low strength	1.00
WyB:						
Wynn	Slight Water erosion	0.10	Low		Severe Low strength	1.00
WyB2:						
Wynn	Slight Water erosion	0.10	Low		Severe Low strength	1.00
WyC2:						
Wynn	Slight Water erosion	0.22	Low		Severe Low strength	1.00
WyD2:						
Wynn	Moderate Water erosion	0.37	Low		Severe Low strength	1.00
XeA:						
Xenia	Slight Water erosion	0.02	Low		Severe Low strength	1.00
XeB:						
Xenia	Slight Water erosion	0.10	Low		Severe Low strength	1.00
XeB2:						
Xenia	Slight Water erosion	0.10	Low		Severe Low strength	1.00
XfB:						
Xenia	Slight Water erosion	0.10	Low		Severe Low strength	1.00

TABLE 13.--WOODLAND PRODUCTIVITY

(See text on page 202 for additional information.)

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber (cu ft/ac)	Trees to manage
CeA:				
Celina	black cherry	---	0	Norway spruce, black walnut, eastern white pine, northern red oak, tuliptree, white ash, white oak
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	110	129	
	white ash	---	0	
	white oak	---	0	
	northern red oak	90	72	
CeB:				
Celina	black cherry	---	0	Norway spruce, black walnut, eastern white pine, northern red oak, tuliptree, white ash, white oak
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	110	129	
	white ash	---	0	
	white oak	---	0	
	northern red oak	90	72	
CeB2:				
Celina	black cherry	---	0	Norway spruce, black walnut, eastern white pine, northern red oak, tuliptree, white ash, white oak
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	110	129	
	white ash	---	0	
	white oak	---	0	
	northern red oak	90	72	
CoA:				
Corwin	black cherry	---	0	American sycamore, black oak, eastern white pine, green ash, northern red oak, red maple, river birch, tuliptree, white ash, white oak
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	100	129	
	white ash	---	0	
	white oak	---	0	
	northern red oak	86	72	
CtA:				
Crosby	black oak	88	72	American sycamore, black oak, eastern white pine, green ash, northern red oak, red maple, river birch, tuliptree, white ash, white oak
	tuliptree	94	100	
	white ash	87	86	
	northern red oak	86	72	
Celina	black cherry	---	0	Norway spruce, black walnut, eastern white pine, northern red oak, tuliptree, white ash, white oak
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	110	129	
	white ash	---	0	
	white oak	---	0	
	northern red oak	90	72	

Table 13.--Woodland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber (cu ft/ac)	Trees to manage
CtB:				
Crosby	black oak	88	72	American sycamore, black oak, eastern white pine, green ash, northern red oak, red maple, river birch, tuliptree, white ash, white oak
	tuliptree	94	100	
	white ash	87	86	
	northern red oak	86	72	
Celina	black cherry	---	0	Norway spruce, black walnut, eastern white pine, northern red oak, tuliptree, white ash, white oak
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	110	129	
	white ash	---	0	
	white oak	---	0	
	northern red oak	90	72	
CvA:				
Crosby	black oak	88	72	American sycamore, black oak, eastern white pine, green ash, northern red oak, red maple, river birch, tuliptree, white ash, white oak
	tuliptree	94	100	
	white ash	87	86	
	northern red oak	86	72	
Lewisburg	black cherry	---	0	Norway spruce, black walnut, eastern white pine, northern red oak, tuliptree, white ash, white oak
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	100	129	
	white ash	---	0	
	white oak	---	0	
	northern red oak	80	57	
CyA:				
Cyclone	white oak	75	57	Norway spruce, baldcypress, eastern white pine, red maple, sweetgum, white ash
	pin oak	90	72	
DaA:				
Dana	tuliptree	98	100	Norway spruce, black walnut, eastern white pine, northern red oak, tuliptree, white ash, white oak
	white oak	90	72	
DaB:				
Dana	tuliptree	98	100	Norway spruce, black walnut, eastern white pine, northern red oak, tuliptree, white ash, white oak
	white oak	90	72	

Table 13.--Woodland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber (cu ft/ac)	Trees to manage
EeA:				
Eel	black walnut	---	0	black locust, black walnut, eastern white pine, tuliptree
	eastern cottonwood	---	0	
	tuliptree	108	114	
	white ash	---	0	
	white oak	---	0	
	northern red oak	80	57	
EgA:				
Eldean	black cherry	---	0	black walnut, eastern white pine, red pine, tuliptree, white ash, white oak
	black oak	80	57	
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	---	0	
	white ash	---	0	
	white oak	80	57	
	northern red oak	80	57	
EgB:				
Eldean	black cherry	---	0	black walnut, eastern white pine, red pine, tuliptree, white ash, white oak
	black oak	80	57	
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	---	0	
	white ash	---	0	
	white oak	80	57	
	northern red oak	80	57	
EgB2:				
Eldean	black cherry	---	0	black walnut, eastern white pine, red pine, tuliptree, white ash, white oak
	black oak	80	57	
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	---	0	
	white ash	---	0	
	white oak	80	57	
	northern red oak	80	57	
EhC3:				
Eldean	black cherry	---	0	black walnut, eastern white pine, red pine, tuliptree, white ash, white oak
	black oak	70	55	
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	---	0	
	white ash	---	0	
	white oak	70	55	
	northern red oak	70	55	
EhD3:				
Eldean	black cherry	---	0	black walnut, eastern white pine, red pine, tuliptree, white ash, white oak
	black oak	70	50	
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	---	0	
	white ash	---	0	
	white oak	70	50	
	northern red oak	70	50	

Table 13.--Woodland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber (cu ft/ac)	Trees to manage
EkA:				
Eldean	black cherry	---	0	black walnut,
	black oak	80	57	eastern white
	black walnut	---	0	pine, red pine,
	sugar maple	---	0	tuliptree, white
	tuliptree	---	0	ash, white oak
	white ash	---	0	
	white oak	80	57	
	northern red oak	80	57	
EkB:				
Eldean	black cherry	---	0	black walnut,
	black oak	80	57	eastern white
	black walnut	---	0	pine, red pine,
	sugar maple	---	0	tuliptree, white
	tuliptree	---	0	ash, white oak
	white ash	---	0	
	white oak	80	57	
	northern red oak	80	57	
EkB2:				
Eldean	black cherry	---	0	black walnut,
	black oak	80	57	eastern white
	black walnut	---	0	pine, red pine,
	sugar maple	---	0	tuliptree, white
	tuliptree	---	0	ash, white oak
	white ash	---	0	
	white oak	80	57	
	northern red oak	80	57	
FcA:				
Fincastle	pin oak	85	72	American sycamore,
	tuliptree	85	86	baldcypress,
	white oak	75	57	eastern white
	northern red oak	75	57	pine, red maple,
				sweetgum,
				tuliptree, white
				ash
FdA:				
Fincastle	pin oak	85	72	American sycamore,
	tuliptree	85	86	baldcypress,
	white oak	75	57	eastern white
	northern red oak	75	57	pine, red maple,
				sweetgum,
				tuliptree, white
				ash
FmA:				
Fox	black cherry	---	0	black locust,
	sugar maple	---	0	chinkapin oak,
	white ash	---	0	eastern white
	white oak	---	0	pine, northern red
	northern red oak	80	57	oak, tuliptree,
				white ash, white
				oak

Table 13.--Woodland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber (cu ft/ac)	Trees to manage
FmB:				
Fox	black cherry	---	0	black locust,
	sugar maple	---	0	chinkapin oak,
	white ash	---	0	eastern white
	white oak	---	0	pine, northern red
	northern red oak	80	57	oak, tuliptree, white ash, white oak
FmB2:				
Fox	black cherry	---	0	black locust,
	sugar maple	---	0	chinkapin oak,
	white ash	---	0	eastern white
	white oak	---	0	pine, northern red
	northern red oak	80	57	oak, tuliptree, white ash, white oak
HeF2:				
Hennepin	black cherry	---	0	Norway spruce,
	black walnut	---	0	eastern white
	sugar maple	---	0	pine, northern red
	tuliptree	---	0	oak, tuliptree,
	white ash	---	0	white ash, white
	white oak	---	0	oak
	northern red oak	80	57	
Miamian	black cherry	---	0	Norway spruce,
	black walnut	---	0	chinkapin oak,
	sugar maple	---	0	eastern white
	tuliptree	---	0	pine, northern red
	white ash	---	0	oak, shagbark
	white oak	---	0	hickory, sugar
	northern red oak	87	72	maple, white ash, white oak
HwE2:				
Hennepin	black cherry	---	0	Norway spruce,
	black walnut	---	0	eastern white
	sugar maple	---	0	pine, northern red
	tuliptree	---	0	oak, tuliptree,
	white ash	---	0	white ash, white
	white oak	---	0	oak
	northern red oak	80	57	
Wynn	northern red oak	85	72	black walnut,
	white oak	85	72	eastern white
	black cherry	---	0	pine, red pine,
	tuliptree	95	100	tuliptree, white
	black walnut	---	0	ash, white oak
	white ash	---	0	
	sugar maple	---	0	
HwF2:				
Hennepin	black cherry	---	0	Norway spruce,
	black walnut	---	0	eastern white
	sugar maple	---	0	pine, northern red
	tuliptree	---	0	oak, tuliptree,
	white ash	---	0	white ash, white
	white oak	---	0	oak
	northern red oak	80	57	

Table 13.--Woodland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber (cu ft/ac)	Trees to manage
Wynn	northern red oak	85	72	black walnut, eastern white pine, red pine, tuliptree, white ash, white oak
	white oak	85	72	
	black cherry	---	0	
	tuliptree	95	100	
	black walnut	---	0	
	white ash	---	0	
	sugar maple	---	0	
KeC2:				
Kendallville	black cherry	---	0	black walnut, eastern white pine, northern red oak, red pine, tuliptree, white ash, white oak
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	95	100	
	white ash	---	0	
	white oak	---	0	
	northern red oak	87	72	
Eldean	black cherry	---	0	black walnut, eastern white pine, red pine, tuliptree, white ash, white oak
	black oak	80	57	
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	---	0	
	white ash	---	0	
	white oak	80	57	
	northern red oak	80	57	
KeD2:				
Kendallville	black cherry	---	0	black walnut, eastern white pine, northern red oak, red pine, tuliptree, white ash, white oak
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	95	100	
	white ash	---	0	
	white oak	---	0	
	northern red oak	87	72	
Eldean	black cherry	---	0	black walnut, eastern white pine, red pine, tuliptree, white ash, white oak
	black oak	80	57	
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	---	0	
	white ash	---	0	
	white oak	80	57	
	northern red oak	80	57	
KnA:				
Kokomo	pin oak	85	72	Norway spruce, baldcypress, eastern white pine, red maple, sweetgum, white ash
	sweetgum	90	100	
	white oak	75	57	
	northern red oak	75	57	
KoA:				
Kokomo	pin oak	85	72	Norway spruce, baldcypress, eastern white pine, red maple, sweetgum, white ash
	sweetgum	90	100	
	white oak	75	57	
	northern red oak	75	57	

Table 13.--Woodland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber (cu ft/ac)	Trees to manage
LeB:				
Lewisburg	black cherry	---	0	American sycamore, black cherry, black locust, eastern white pine, green ash, northern red oak, red pine, tuliptree, white ash, white oak
	sugar maple	---	0	
	tuliptree	---	0	
	white ash	---	0	
	white oak	75	57	
	northern red oak	80	57	
Celina	black cherry	---	0	Norway spruce, black walnut, eastern white pine, northern red oak, tuliptree, white ash, white oak
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	110	129	
	white ash	---	0	
	white oak	---	0	
	northern red oak	90	72	
LfB2:				
Lewisburg	black cherry	---	0	American sycamore, black cherry, black locust, eastern white pine, green ash, northern red oak, red pine, tuliptree, white ash, white oak
	sugar maple	---	0	
	tuliptree	---	0	
	white ash	---	0	
	white oak	75	57	
	northern red oak	80	57	
Celina	black cherry	---	0	Norway spruce, black walnut, eastern white pine, northern red oak, tuliptree, white ash, white oak
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	110	129	
	white ash	---	0	
	white oak	---	0	
	northern red oak	90	72	
LgC3:				
Lewisburg	black cherry	---	0	American sycamore, black cherry, black locust, eastern white pine, green ash, northern red oak, red pine, tuliptree, white ash, white oak
	sugar maple	---	0	
	tuliptree	---	0	
	white ash	---	0	
	white oak	75	57	
	northern red oak	75	55	
LpA:				
Lippincott	black cherry	---	0	American sycamore, baldcypress, eastern cottonwood, green ash, pin oak, red maple, silver maple, swamp white oak, sweetgum
	black oak	80	57	
	eastern cottonwood	---	0	
	green ash	---	0	
	pin oak	88	72	
	red maple	---	0	
	swamp white oak	85	72	
	northern red oak	80	57	

Table 13.--Woodland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber (cu ft/ac)	Trees to manage
MaA:				
Medway	black cherry	---	0	black walnut, eastern white pine, northern red oak, red pine, tuliptree, white ash, white oak
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	96	100	
	white ash	---	0	
	white oak	---	0	
	northern red oak	86	72	
MbB2:				
Miami	white oak	90	72	Shumard's oak, black cherry, black walnut, eastern white pine, green ash, northern red oak, tuliptree, white ash, white oak
	tuliptree	98	100	
	sweetgum	76	72	
McE2:				
Miami	white oak	90	72	Shumard's oak, black cherry, black walnut, eastern white pine, green ash, northern red oak, tuliptree, white ash, white oak
	tuliptree	98	100	
	sweetgum	76	72	
Kendallville	black cherry	---	0	black walnut, eastern white pine, northern red oak, red pine, tuliptree, white ash, white oak
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	95	100	
	white ash	---	0	
	white oak	---	0	
	northern red oak	87	72	
McF2:				
Miami	white oak	90	72	Shumard's oak, black cherry, black walnut, eastern white pine, green ash, northern red oak, tuliptree, white ash, white oak
	tuliptree	98	100	
	sweetgum	76	72	
Kendallville	black cherry	---	0	black walnut, eastern white pine, northern red oak, red pine, tuliptree, white ash, white oak
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	95	100	
	white ash	---	0	
	white oak	---	0	
	northern red oak	87	72	

Table 13.--Woodland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber (cu ft/ac)	Trees to manage
MdC2:				
Miami	white oak	90	72	Shumard's oak, black cherry, black walnut, eastern white pine, green ash, northern red oak, tuliptree, white ash, white oak
	tuliptree	98	100	
	sweetgum	76	72	
MdD2:				
Miami	white oak	90	72	Shumard's oak, black cherry, black walnut, eastern white pine, green ash, northern red oak, tuliptree, white ash, white oak
	tuliptree	98	100	
	sweetgum	76	72	
MeC:				
Miamian	black cherry	---	0	Norway spruce, chinkapin oak, eastern white pine, northern red oak, shagbark hickory, sugar maple, tuliptree, white ash, white oak
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	---	0	
	white ash	---	0	
	white oak	---	0	
	northern red oak	87	72	
MeC2:				
Miamian	black cherry	---	0	Norway spruce, chinkapin oak, eastern white pine, northern red oak, shagbark hickory, sugar maple, tuliptree, white ash, white oak
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	---	0	
	white ash	---	0	
	white oak	---	0	
	northern red oak	87	72	
MeD2:				
Miamian	black cherry	---	0	Norway spruce, chinkapin oak, eastern white pine, northern red oak, shagbark hickory, sugar maple, tuliptree, white ash, white oak
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	---	0	
	white ash	---	0	
	white oak	---	0	
	northern red oak	87	72	

Table 13.--Woodland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber (cu ft/ac)	Trees to manage
MfB:				
Miamian	black cherry	---	0	Norway spruce, chinkapin oak, eastern white pine, northern red oak, shagbark hickory, sugar maple, tuliptree, white ash, white oak
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	---	0	
	white ash	---	0	
	white oak	---	0	
	northern red oak	87	72	
Celina	black cherry	---	0	Norway spruce, black walnut, eastern white pine, northern red oak, tuliptree, white ash, white oak
	black walnut	---	0	
	northern red oak	90	72	
	sugar maple	---	0	
	tuliptree	110	129	
	white ash	---	0	
	white oak	---	0	
MfB2:				
Miamian	black cherry	---	0	Norway spruce, chinkapin oak, eastern white pine, northern red oak, shagbark hickory, sugar maple, tuliptree, white ash, white oak
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	---	0	
	white ash	---	0	
	white oak	---	0	
	northern red oak	87	72	
Celina	black cherry	---	0	Norway spruce, black walnut, eastern white pine, northern red oak, tuliptree, white ash, white oak
	black walnut	---	0	
	northern red oak	90	72	
	sugar maple	---	0	
	tuliptree	110	129	
	white ash	---	0	
	white oak	---	0	
MgE2:				
Miamian	black cherry	---	0	Norway spruce, chinkapin oak, eastern white pine, northern red oak, shagbark hickory, sugar maple, tuliptree, white ash, white oak
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	---	0	
	white ash	---	0	
	white oak	---	0	
	northern red oak	87	72	
Kendallville	black cherry	---	0	black walnut, eastern white pine, northern red oak, red pine, tuliptree, white ash, white oak
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	95	100	
	white ash	---	0	
	white oak	---	0	
	northern red oak	87	72	

Table 13.--Woodland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber (cu ft/ac)	Trees to manage
MgF2:				
Miamian	black cherry	---	0	Norway spruce, chinkapin oak, eastern white pine, northern red oak, shagbark hickory, sugar maple, tuliptree, white ash, white oak
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	---	0	
	white ash	---	0	
	white oak	---	0	
	northern red oak	87	72	
Kendallville	black cherry	---	0	black walnut, eastern white pine, northern red oak, red pine, white ash, white oak
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	95	100	
	white ash	---	0	
	white oak	---	0	
	northern red oak	87	72	
MhC3:				
Miamian	black cherry	---	0	Norway spruce, chinkapin oak, eastern white pine, northern red oak, shagbark hickory, sugar maple, tuliptree, white ash, white oak
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	---	0	
	white ash	---	0	
	white oak	---	0	
	northern red oak	87	72	
Losantville	black cherry	---	0	American sycamore, black cherry, black locust, eastern white pine, green ash, northern red oak, red pine, tuliptree, white ash, white oak
	sugar maple	---	0	
	tuliptree	---	0	
	white ash	---	0	
	white oak	75	57	
	northern red oak	80	57	
MhD3:				
Miamian	black cherry	---	0	Norway spruce, chinkapin oak, eastern white pine, northern red oak, shagbark hickory, sugar maple, tuliptree, white ash, white oak
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	---	0	
	white ash	---	0	
	white oak	---	0	
	northern red oak	87	72	
Losantville	black cherry	---	0	American sycamore, black cherry, black locust, eastern white pine, green ash, northern red oak, red pine, tuliptree, white ash, white oak
	sugar maple	---	0	
	tuliptree	---	0	
	white ash	---	0	
	white oak	75	57	
	northern red oak	80	57	

Table 13.--Woodland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber (cu ft/ac)	Trees to manage
MmE2:				
Miamian	black cherry	---	0	Norway spruce, chinkapin oak, eastern white pine, northern red oak, shagbark hickory, sugar maple, tuliptree, white ash, white oak
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	---	0	
	white ash	---	0	
	white oak	---	0	
	northern red oak	87	72	
Hennepin	black cherry	---	0	Norway spruce, eastern white pine, northern red oak, tuliptree, white ash, white oak
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	---	0	
	white ash	---	0	
	white oak	---	0	
	northern red oak	80	57	
MnE3:				
Miamian	black cherry	---	0	Norway spruce, chinkapin oak, eastern white pine, northern red oak, shagbark hickory, sugar maple, tuliptree, white ash, white oak
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	---	0	
	white ash	---	0	
	white oak	---	0	
	northern red oak	80	57	
Hennepin	black cherry	---	0	Norway spruce, eastern white pine, northern red oak, tuliptree, white ash, white oak
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	---	0	
	white ash	---	0	
	white oak	---	0	
	northern red oak	80	57	
MpA:				
Milford	pin oak	85	72	Norway spruce, baldcypress, eastern white pine, red maple, sweetgum, white ash
	sweetgum	90	100	
	white oak	75	57	
	northern red oak	75	57	
MrA:				
Milford	pin oak	85	72	Norway spruce, baldcypress, eastern white pine, red maple, sweetgum, white ash
	sweetgum	90	100	
	white oak	75	57	
	northern red oak	75	57	

Table 13.--Woodland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber (cu ft/ac)	Trees to manage
MsA:				
Millsdale	black cherry	---	0	American sycamore,
	eastern cottonwood	---	0	baldcypress,
	green ash	---	0	eastern
	red maple	---	0	cottonwood, green
	swamp white oak	---	0	ash, pin oak, red
	pin oak	86	72	maple, swamp white
				oak, sweetgum
MtA:				
Millsdale	black cherry	---	0	American sycamore,
	eastern cottonwood	---	0	baldcypress,
	green ash	---	0	eastern
	red maple	---	0	cottonwood, green
	swamp white oak	---	0	ash, pin oak, red
	pin oak	86	72	maple, swamp white
				oak, sweetgum
MuA:				
Milton	black cherry	---	0	black walnut,
	black walnut	---	0	eastern white
	sugar maple	---	0	pine, northern red
	tuliptree	95	100	oak, red pine,
	white ash	---	0	tuliptree, white
	white oak	---	0	ash, white oak
	northern red oak	80	57	
MuB:				
Milton	black cherry	---	0	black walnut,
	black walnut	---	0	eastern white
	sugar maple	---	0	pine, northern red
	tuliptree	95	100	oak, red pine,
	white ash	---	0	tuliptree, white
	white oak	---	0	ash, white oak
	northern red oak	80	57	
MuB2:				
Milton	black cherry	---	0	black walnut,
	black walnut	---	0	eastern white
	sugar maple	---	0	pine, northern red
	tuliptree	95	100	oak, red pine,
	white ash	---	0	tuliptree, white
	white oak	---	0	ash, white oak
	northern red oak	80	57	
MuC2:				
Milton	black cherry	---	0	black walnut,
	black walnut	---	0	eastern white
	sugar maple	---	0	pine, northern red
	tuliptree	95	100	oak, red pine,
	white ash	---	0	tuliptree, white
	white oak	---	0	ash, white oak
	northern red oak	80	57	

Table 13.--Woodland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber (cu ft/ac)	Trees to manage
MuD2:				
Milton	black cherry	---	0	black walnut, eastern white pine, northern red oak, red pine, tuliptree, white ash, white oak
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	95	100	
	white ash	---	0	
	white oak	---	0	
	northern red oak	80	57	
MuE2:				
Milton	black cherry	---	0	black walnut, eastern white pine, northern red oak, red pine, tuliptree, white ash, white oak
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	95	100	
	white ash	---	0	
	white oak	---	0	
	northern red oak	80	57	
MwA:				
Morningsun	green ash	---	0	Scotch pine, black walnut, eastern white pine, green ash, northern red oak, red pine, white oak
	northern red oak	---	0	
	white oak	86	72	
MxA:				
Morningsun	green ash	---	0	Scotch pine, black walnut, eastern white pine, green ash, northern red oak, red pine, white oak
	northern red oak	---	0	
	white oak	86	72	
Xenia	tuliptree	98	100	black walnut, eastern white pine, red pine, sweetgum, tuliptree, white ash
	white oak	90	72	
MxB:				
Morningsun	green ash	---	0	Scotch pine, black walnut, eastern white pine, green ash, northern red oak, red pine, white oak
	white oak	86	72	
	northern red oak	---	0	
Xenia	tuliptree	98	100	black walnut, eastern white pine, red pine, sweetgum, tuliptree, white ash
	white oak	90	72	

Table 13.--Woodland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber (cu ft/ac)	Trees to manage
MxB2:				
Morningsun	green ash	---	0	Scotch pine, black walnut, eastern white pine, green ash, northern red oak, red pine, white oak
	white oak	86	72	
	northern red oak	---	0	
Xenia	tuliptree	98	100	black walnut, eastern white pine, red pine, sweetgum, tuliptree, white ash
	white oak	90	72	
MyA:				
Mahalasville	pin oak	85	72	blackgum, bur oak, green ash, pin oak, red maple, shellbark hickory, silver maple, swamp white oak, tamarack
	white oak	75	57	
OcA:				
Ockley	tuliptree	98	100	black walnut, eastern white pine, red pine, sweetgum, tuliptree, white ash
	northern red oak	90	72	
	white oak	90	72	
OcB:				
Ockley	tuliptree	98	100	black walnut, eastern white pine, red pine, sweetgum, tuliptree, white ash
	northern red oak	90	72	
	white oak	90	72	
Pg:				
Pits, Gravel	---	---	---	---
Pq:				
Pits, Quarry	---	---	---	---
PtB:				
Plattville	black cherry	---	0	American sycamore, black oak, eastern white pine, green ash, northern red oak, red maple, river birch, tuliptree, white ash, white oak
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	100	129	
	white ash	---	0	
	white oak	---	0	
	northern red oak	86	72	

Table 13.--Woodland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
RaA:				
Rainsville	northern red oak	90	72	bur oak, eastern white pine, green ash, northern red oak, tuliptree, white ash, white oak
	tuliptree	98	100	
	white oak	88	72	
	shagbark hickory	---	0	
RaB:				
Rainsville	northern red oak	90	72	bur oak, eastern white pine, green ash, northern red oak, tuliptree, white ash, white oak
	tuliptree	98	100	
	white oak	88	72	
	shagbark hickory	---	0	
RaB2:				
Rainsville	northern red oak	90	72	bur oak, eastern white pine, green ash, northern red oak, tuliptree, white ash, white oak
	tuliptree	98	100	
	white oak	88	72	
	shagbark hickory	---	0	
RcA:				
Randolph	sugar maple	90	57	American sycamore, baldcypress, eastern cottonwood, eastern white pine, green ash, pin oak, red maple, swamp white oak, sweetgum, tuliptree
	tuliptree	85	86	
	northern red oak	75	57	
RcB:				
Randolph	sugar maple	90	57	American sycamore, baldcypress, eastern cottonwood, eastern white pine, green ash, pin oak, red maple, swamp white oak, sweetgum, tuliptree
	tuliptree	85	86	
	northern red oak	75	57	
RnE2:				
Rodman	eastern white pine	85	200	eastern white pine, jack pine, red pine
	red pine	75	143	
	white oak	70	57	
	northern red oak	70	57	
RnF2:				
Rodman	eastern white pine	85	200	eastern white pine, jack pine, red pine
	red pine	75	143	
	white oak	70	57	
	northern red oak	70	57	

Table 13.--Woodland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber (cu ft/ac)	Trees to manage
RoE2:				
Rodman	eastern white pine	85	200	eastern white pine, jack pine, red pine
	red pine	75	143	
	northern red oak	70	57	
	white oak	70	57	
Kendallville	black cherry	---	0	black walnut, eastern white pine, northern red oak, red pine, tuliptree, white ash, white oak, northern red oak
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	95	100	
	white ash	---	0	
	white oak	---	0	
	northern red oak	87	72	
RoF2:				
Rodman	eastern white pine	85	200	eastern white pine, jack pine, red pine
	red pine	75	143	
	northern red oak	70	57	
	white oak	70	57	
Kendallville	black cherry	---	0	black walnut, eastern white pine, northern red oak, red pine, tuliptree, white ash, white oak, northern red oak
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	95	100	
	white ash	---	0	
	white oak	---	0	
	northern red oak	87	72	
RpA:				
Rossburg	tuliptree	---	0	black walnut, northern red oak, tuliptree, white oak
	northern red oak	86	72	
	white oak	90	75	
RuB:				
Russell	northern red oak	90	72	black cherry, black locust, black walnut, eastern white pine, green ash, northern red oak, red pine, sweetgum, tuliptree, white ash, white oak
	white oak	90	72	
	tuliptree	98	100	
Miamian	black cherry	---	0	Norway spruce, chinkapin oak, eastern white pine, northern red oak, shagbark hickory, sugar maple, tuliptree, white ash, white oak
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	---	0	
	white ash	---	0	
	white oak	---	0	
	northern red oak	87	72	

Table 13.--Woodland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber (cu ft/ac)	Trees to manage
RuB2:				
Russell	northern red oak	90	72	black cherry, black locust, black walnut, eastern white pine, green ash, northern red oak, red pine, sweetgum, tuliptree, white ash, white oak
	white oak	90	72	
	tuliptree	98	100	
Miamian	black cherry	---	0	Norway spruce, chinkapin oak, eastern white pine, northern red oak, shagbark hickory, sugar maple, tuliptree, white ash, white oak
	black walnut	---	0	
	sugar maple	---	0	
	tuliptree	---	0	
	white ash	---	0	
	white oak	---	0	
	northern red oak	87	72	
SeA:				
Savona	black cherry	---	0	American sycamore, black cherry, black locust, eastern cottonwood, eastern white pine, green ash, northern red oak, red pine, tuliptree, white ash, white oak
	northern red oak	---	0	
	sugar maple	---	0	
	tuliptree	---	0	
	white ash	---	0	
	white oak	---	0	
	pin oak	80	57	
SnA:				
Sloan	eastern cottonwood	---	0	American sycamore, eastern cottonwood, green ash, pin oak, red maple, silver maple, swamp white oak, sweetgum
	green ash	---	0	
	red maple	---	0	
	swamp white oak	---	0	
	pin oak	86	72	
StA:				
Stonelick	American sycamore	---	0	American sycamore, black walnut, bur oak, eastern cottonwood, green ash, tuliptree
	eastern cottonwood	---	0	
	green ash	---	0	
	swamp white oak	---	0	
	sweetgum	---	0	
	tuliptree	95	100	
	pin oak	86	72	
SvA:				
Sugarvalley	black cherry	---	0	American sycamore, baldcypress, eastern cottonwood, green ash, pin oak, red maple, silver maple, swamp white oak, sweetgum
	eastern cottonwood	---	0	
	green ash	---	0	
	pin oak	---	0	
	red maple	---	0	
	sugar maple	90	57	
	swamp white oak	---	0	
	tuliptree	86	86	
	northern red oak	76	57	

Table 13.--Woodland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber (cu ft/ac)	Trees to manage
SwA:				
Sugarvalley	black cherry	---	0	American sycamore,
	eastern cottonwood	---	0	baldcypress,
	green ash	---	0	eastern
	pin oak	---	0	cottonwood, green
	red maple	---	0	ash, pin oak, red
	sugar maple	90	57	maple, red pine,
	swamp white oak	---	0	silver maple,
	tuliptree	86	86	swamp white oak,
	northern red oak	76	57	sweetgum
Fincastle	northern red oak	75	57	American sycamore,
	pin oak	85	72	baldcypress, bur
	white oak	75	57	oak, green ash,
	sweetgum	80	86	red maple,
	tuliptree	85	86	sweetgum,
				tuliptree, white
				ash
ThA:				
Thackery	northern red oak	90	72	black cherry, black
	white oak	90	72	locust, black
	black cherry	---	0	walnut, eastern
	tuliptree	98	100	white pine, green
	black walnut	---	0	ash, northern red
	white ash	---	0	oak, red pine,
	sugar maple	---	0	tuliptree, white
				ash, white oak
ThB:				
Thackery	northern red oak	90	72	black cherry, black
	white oak	90	72	locust, black
	black cherry	---	0	walnut, eastern
	tuliptree	98	100	white pine, green
	black walnut	---	0	ash, northern red
	white ash	---	0	oak, red pine,
	sugar maple	---	0	tuliptree, white
				ash, white oak
Ud:				
Udorthents	---	---	---	---
W:				
Water	---	---	---	---
WbA:				
Warsaw	northern red oak	80	57	black locust,
	white oak	75	57	chinkapin oak,
	black cherry	---	0	eastern white
	white ash	---	0	pine, northern red
	sugar maple	---	0	oak, tuliptree,
				white ash, white
				oak

Table 13.--Woodland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber (cu ft/ac)	Trees to manage
WnA:				
Westland	pin oak	85	72	American sycamore, baldcypress, bur oak, eastern cottonwood, green ash, pin oak, red maple, swamp white oak, sweetgum, white ash
	white oak	75	57	
	sweetgum	90	100	
WyB:				
Wynn	northern red oak	85	72	black walnut, eastern white pine, red pine, tuliptree, white ash, white oak
	white oak	85	72	
	black cherry	---	0	
	tuliptree	95	100	
	black walnut	---	0	
	white ash	---	0	
	sugar maple	---	0	
WyB2:				
Wynn	northern red oak	85	72	black walnut, eastern white pine, red pine, tuliptree, white ash, white oak
	white oak	85	72	
	black cherry	---	0	
	tuliptree	95	100	
	black walnut	---	0	
	white ash	---	0	
	sugar maple	---	0	
WyC2:				
Wynn	northern red oak	85	72	black walnut, eastern white pine, red pine, tuliptree, white ash, white oak
	white oak	85	72	
	black cherry	---	0	
	tuliptree	95	100	
	black walnut	---	0	
	white ash	---	0	
	sugar maple	---	0	
WyD2:				
Wynn	northern red oak	85	72	black walnut, eastern white pine, red pine, tuliptree, white ash, white oak
	white oak	85	72	
	black cherry	---	0	
	tuliptree	95	100	
	black walnut	---	0	
	white ash	---	0	
	sugar maple	---	0	
XeA:				
Xenia	white oak	90	72	black walnut, eastern white pine, red pine, sweetgum, tuliptree, white ash
	tuliptree	98	100	
XeB:				
Xenia	white oak	90	72	black walnut, eastern white pine, red pine, sweetgum, tuliptree, white ash
	tuliptree	98	100	

Table 13.--Woodland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber (cu ft/ac)	Trees to manage
XeB2:				
Xenia	white oak	90	72	black walnut, eastern white pine, red pine, sweetgum, tuliptree, white ash
	tuliptree	98	100	
XfB:				
Xenia	white oak	90	72	black walnut, eastern white pine, red pine, sweetgum, tuliptree, white ash
	tuliptree	98	100	

TABLE 14.--WOODLAND HARVESTING ACTIVITIES

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text on page 199 for further explanation of ratings in this table.)

Map symbol and soil name	Limitations affecting construction of haul roads and log landings		Suitability for roads (natural surface)		Harvest equipment operability	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CeA:						
Celina	Moderate Low strength	 0.50	Moderately suited Low strength	 0.50	Moderately suited Low strength	 0.50
CeB:						
Celina	Moderate Low strength	 0.50	Moderately suited Low strength	 0.50	Moderately suited Low strength	 0.50
CeB2:						
Celina	Moderate Low strength	 0.50	Moderately suited Low strength	 0.50	Moderately suited Low strength	 0.50
CoA:						
Corwin	Moderate Low strength	 0.50	Moderately suited Low strength	 0.50	Moderately suited Low strength	 0.50
CtA:						
Crosby	Moderate Low strength	 0.50	Moderately suited Depth to saturated zone Low strength	 0.50 0.50	Moderately suited Low strength	 0.50
Celina	Moderate Low strength	 0.50	Moderately suited Low strength	 0.50	Moderately suited Low strength	 0.50
CtB:						
Crosby	Moderate Low strength	 0.50	Moderately suited Depth to saturated zone Low strength	 0.50 0.50	Moderately suited Low strength	 0.50
Celina	Moderate Low strength	 0.50	Moderately suited Low strength	 0.50	Moderately suited Low strength	 0.50
CvA:						
Crosby	Moderate Low strength	 0.50	Moderately suited Depth to saturated zone Low strength	 0.50 0.50	Moderately suited Low strength	 0.50
Lewisburg	Moderate Low strength	 0.50	Moderately suited Depth to saturated zone Low strength	 0.50 0.50	Moderately suited Low strength	 0.50
CyA:						
Cyclone	Moderate Low strength	 0.50	Poorly suited Ponding Depth to saturated zone Low strength	 1.00 1.00 0.50	Moderately suited Low strength	 0.50
DaA:						
Dana	Moderate Low strength	 0.50	Moderately suited Low strength	 0.50	Moderately suited Low strength	 0.50

Table 14.--Woodland Harvesting Activities--Continued

Map symbol and soil name	Limitations affecting construction of haul roads and log landings		Suitability for roads (natural surface)		Harvest equipment operability	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
DaB:						
Dana	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
EeA:						
Eel	Severe		Poorly suited		Moderately suited	
	Flooding	1.00	Flooding	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50		
			Depth to saturated zone	0.50		
EgA:						
Eldean	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
EgB:						
Eldean	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
EgB2:						
Eldean	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
EhC3:						
Eldean	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Slope	0.50	Low strength	0.50
			Low strength	0.50		
EhD3:						
Eldean	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50		
EkA:						
Eldean	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
EkB:						
Eldean	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
EkB2:						
Eldean	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
FcA:						
Fincastle	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
			Low strength	0.50		
FdA:						
Fincastle	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
			Low strength	0.50		
FmA:						
Fox	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50

Table 14.--Woodland Harvesting Activities--Continued

Map symbol and soil name	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value	Harvest equipment operability: Rating class and limiting features	Value
FmB:						
Fox	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
FmB2:						
Fox	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
HeF2:						
Hennepin	Severe		Poorly suited		Poorly suited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	0.50	Low strength	0.50	Low strength	0.50
Miamian	Severe		Poorly suited		Poorly suited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	0.50	Low strength	0.50	Low strength	0.50
HwE2:						
Hennepin	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50	Slope	0.50
Wynn	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50	Slope	0.50
HwF2:						
Hennepin	Severe		Poorly suited		Poorly suited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	0.50	Low strength	0.50	Low strength	0.50
Wynn	Severe		Poorly suited		Poorly suited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	0.50	Low strength	0.50	Low strength	0.50
KeC2:						
Kendallville	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Slope	0.50	Low strength	0.50
			Low strength	0.50		
Eldean	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Slope	0.50	Low strength	0.50
			Low strength	0.50		
KeD2:						
Kendallville	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50		
Eldean	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50		
KnA:						
Kokomo	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		

Table 14.--Woodland Harvesting Activities--Continued

Map symbol and soil name	Limitations affecting construction of haul roads and log landings		Suitability for roads (natural surface)		Harvest equipment operability	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
KoA:						
Kokomo	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		
LeB:						
Lewisburg	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
			Low strength	0.50		
Celina	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
LfB2:						
Lewisburg	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
	Stickiness	0.50	Low strength	0.50		
Celina	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
LgC3:						
Lewisburg	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
	Stickiness	0.50	Slope	0.50		
			Low strength	0.50		
LpA:						
Lippincott	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		
MaA:						
Medway	Severe		Poorly suited		Moderately suited	
	Flooding	1.00	Flooding	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50		
MbB2:						
Miami	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
McE2:						
Miami	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50	Slope	0.50
Kendallville	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50	Slope	0.50

Table 14.--Woodland Harvesting Activities--Continued

Map symbol and soil name	Limitations affecting construction of haul roads and log landings		Suitability for roads (natural surface)		Harvest equipment operability	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
McF2:						
Miami	Severe		Poorly suited		Poorly suited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	0.50	Low strength	0.50	Low strength	0.50
Kendallville	Severe		Poorly suited		Poorly suited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	0.50	Low strength	0.50	Low strength	0.50
MdC2:						
Miami	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Slope	0.50	Low strength	0.50
			Low strength	0.50		
MdD2:						
Miami	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50		
MeC:						
Miamian	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Slope	0.50	Low strength	0.50
			Low strength	0.50		
MeC2:						
Miamian	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Slope	0.50	Low strength	0.50
			Low strength	0.50		
MeD2:						
Miamian	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50		
MfB:						
Miamian	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
Celina	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
MfB2:						
Miamian	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
Celina	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
MgE2:						
Miamian	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50	Slope	0.50
	Stickiness	0.50				
Kendallville	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50	Slope	0.50

Table 14.--Woodland Harvesting Activities--Continued

Map symbol and soil name	Limitations affecting construction of haul roads and log landings		Suitability for roads (natural surface)		Harvest equipment operability	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MgF2:						
Miamian	Severe		Poorly suited		Poorly suited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	0.50	Low strength	0.50	Low strength	0.50
Kendallville	Severe		Poorly suited		Poorly suited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	0.50	Low strength	0.50	Low strength	0.50
MhC3:						
Miamian	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Slope	0.50	Low strength	0.50
			Low strength	0.50		
Losantville	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Slope	0.50	Low strength	0.50
			Low strength	0.50		
			Depth to saturated zone	0.50		
MhD3:						
Miamian	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Stickiness	0.50	Low strength	0.50		
	Low strength	0.50				
Losantville	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50		
			Depth to saturated zone	0.50		
MmE2:						
Miamian	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50	Slope	0.50
	Stickiness	0.50				
Hennepin	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50	Slope	0.50
MnE3:						
Miamian	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50	Slope	0.50
	Stickiness	0.50				
Hennepin	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50	Slope	0.50
MpA:						
Milford	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		

Table 14.--Woodland Harvesting Activities--Continued

Map symbol and soil name	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value	Harvest equipment operability: Rating class and limiting features	Value
MrA:						
Milford	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		
MsA:						
Millsdale	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
	Depth to bedrock	0.50	Depth to saturated zone	1.00		
			Low strength	0.50		
MtA:						
Millsdale	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
	Depth to bedrock	0.50	Depth to saturated zone	1.00		
			Low strength	0.50		
MuA:						
Milton	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
	Depth to bedrock	0.50				
MuB:						
Milton	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
	Depth to bedrock	0.50				
MuB2:						
Milton	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
	Stickiness	0.50				
	Depth to bedrock	0.50				
MuC2:						
Milton	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Slope	0.50	Low strength	0.50
	Stickiness	0.50	Low strength	0.50		
	Depth to bedrock	0.50				
MuD2:						
Milton	Severe		Poorly suited		Moderately suited	
	Depth to bedrock	1.00	Slope	1.00	Low strength	0.50
	Slope	0.50	Low strength	0.50		
	Stickiness	0.50				
	Low strength	0.50				
MuE2:						
Milton	Severe		Poorly suited		Moderately suited	
	Depth to bedrock	1.00	Slope	1.00	Low strength	0.50
	Slope	0.50	Low strength	0.50	Slope	0.50
	Low strength	0.50				
	Stickiness	0.50				
MwA:						
Morningsun	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50

Table 14.--Woodland Harvesting Activities--Continued

Map symbol and soil name	Limitations affecting construction of haul roads and log landings		Suitability for roads (natural surface)		Harvest equipment operability	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MxA:						
Morningsun	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
Xenia	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
MxB:						
Morningsun	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
Xenia	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
MxB2:						
Morningsun	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
Xenia	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
MyA:						
Mahalasville	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		
OcA:						
Ockley	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
OcB:						
Ockley	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
Pg:						
Pits, Gravel	Not rated		Not rated		Not rated	
Pq:						
Pits, Quarry	Not rated		Not rated		Not rated	
PtB:						
Plattville	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
RaA:						
Rainsville	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
RaB:						
Rainsville	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
RaB2:						
Rainsville	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50

Table 14.--Woodland Harvesting Activities--Continued

Map symbol and soil name	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value	Harvest equipment operability: Rating class and limiting features	Value
RcA:						
Randolph	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	1.00	Low strength	0.50
	Depth to bedrock	0.50	Low strength	0.50		
RcB:						
Randolph	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	1.00	Low strength	0.50
	Depth to bedrock	0.50	Low strength	0.50		
RnE2:						
Rodman	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Too sandy	0.50	Low strength	0.50	Slope	0.50
RnF2:						
Rodman	Severe		Poorly suited		Poorly suited	
	Slope	1.00	Slope	1.00	Slope	1.00
			Low strength	0.50	Low strength	0.50
RoE2:						
Rodman	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Too sandy	0.50	Low strength	0.50	Slope	0.50
Kendallville	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50	Slope	0.50
RoF2:						
Rodman	Severe		Poorly suited		Poorly suited	
	Slope	1.00	Slope	1.00	Slope	1.00
			Low strength	0.50	Low strength	0.50
Kendallville	Severe		Poorly suited		Poorly suited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	0.50	Low strength	0.50	Low strength	0.50
RpA:						
Rossburg	Severe		Poorly suited		Moderately suited	
	Flooding	1.00	Flooding	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50		
RuB:						
Russell	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
Miamian	Slight		Moderately suited		Moderately suited	
			Low strength	0.50	Low strength	0.50
RuB2:						
Russell	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
Miamian	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50

Table 14.--Woodland Harvesting Activities--Continued

Map symbol and soil name	Limitations affecting construction of haul roads and log landings		Suitability for roads (natural surface)		Harvest equipment operability	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SeA:						
Savona	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
			Low strength	0.50		
SnA:						
Sloan	Severe		Poorly suited		Moderately suited	
	Flooding	1.00	Ponding	1.00	Low strength	0.50
	Low strength	0.50	Flooding	1.00		
			Depth to saturated zone	1.00		
			Low strength	0.50		
StA:						
Stonelick	Severe		Poorly suited		Moderately suited	
	Flooding	1.00	Flooding	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50		
SvA:						
Sugarvalley	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
			Low strength	0.50		
SwA:						
Sugarvalley	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
			Low strength	0.50		
Fincastle	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
			Low strength	0.50		
ThA:						
Thackery	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
			Depth to saturated zone	0.50		
ThB:						
Thackery	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
Ud:						
Udorthents	Not rated		Not rated		Not rated	
W:						
Water	Not rated		Not rated		Not rated	
WbA:						
Warsaw	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50

Table 14.--Woodland Harvesting Activities--Continued

Map symbol and soil name	Limitations affecting construction of haul roads and log landings		Suitability for roads (natural surface)		Harvest equipment operability	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WnA:						
Westland	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		
WyB:						
Wynn	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
WyB2:						
Wynn	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
WyC2:						
Wynn	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Slope	0.50	Low strength	0.50
			Low strength	0.50		
WyD2:						
Wynn	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50		
XeA:						
Xenia	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
XeB:						
Xenia	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
XeB2:						
Xenia	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
XfB:						
Xenia	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50

TABLE 15.--WOODLAND REGENERATION ACTIVITIES

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text on page 199 for further explanation of ratings in this table.)

Map symbol and soil name	Suitability for mechanical planting		Suitability for site preparation		Potential for damage to soil by fire	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CeA:						
Celina	Moderately suited Stickiness	0.50	Poorly suited Stickiness	0.50	Low Texture/rock fragments	0.01
CeB:						
Celina	Moderately suited Stickiness	0.50	Poorly suited Stickiness	0.50	Low Texture/rock fragments	0.01
CeB2:						
Celina	Moderately suited Stickiness	0.50	Poorly suited Stickiness	0.50	Moderate Texture/rock fragments	0.50
CoA:						
Corwin	Well suited		Well suited		Low Texture/rock fragments	0.01
CtA:						
Crosby	Moderately suited Stickiness	0.50	Well suited		Low Texture/rock fragments	0.01
Celina	Moderately suited Stickiness	0.50	Poorly suited Stickiness	0.50	Low Texture/rock fragments	0.01
CtB:						
Crosby	Moderately suited Stickiness	0.50	Well suited		Low Texture/rock fragments	0.01
Celina	Moderately suited Stickiness	0.50	Poorly suited Stickiness	0.50	Low Texture/rock fragments	0.01
CvA:						
Crosby	Moderately suited Stickiness	0.50	Well suited		Low Texture/rock fragments	0.01
Lewisburg	Moderately suited Stickiness	0.50	Poorly suited Stickiness	0.50	Low Texture/rock fragments	0.01
CyA:						
Cyclone	Well suited		Well suited		Low Texture/rock fragments	0.01
DaA:						
Dana	Moderately suited Stickiness	0.50	Well suited		Low Texture/rock fragments	0.01

Table 15.--Woodland Regeneration Activities--Continued

Map symbol and soil name	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for site preparation: Rating class and limiting features	Value	Potential for damage to soil by fire: Rating class and limiting features	Value
DaB:						
Dana	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.01
EeA:						
Eel	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
EgA:						
Eldean	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/surface depth/rock fragments	0.30
	Rock fragment content	0.31				
EgB:						
Eldean	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/surface depth/rock fragments	0.30
	Rock fragment content	0.31				
EgB2:						
Eldean	Moderately suited		Well suited		Moderate	
	Stickiness	0.50			Texture/surface depth/rock fragments	0.50
	Rock fragment content	0.31				
EhC3:						
Eldean	Moderately suited		Well suited		Moderate	
	Slope	0.50			Texture/rock fragments	0.50
	Rock fragment content	0.31				
EhD3:						
Eldean	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/rock fragments	0.50
	Rock fragment content	0.31				
EkA:						
Eldean	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.01
	Rock fragment content	0.22				
EkB:						
Eldean	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.01

Table 15.--Woodland Regeneration Activities--Continued

Map symbol and soil name	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for site preparation: Rating class and limiting features	Value	Potential for damage to soil by fire: Rating class and limiting features	Value
EkB2:						
Eldean	Moderately suited		Well suited		Moderate	
	Stickiness	0.50			Texture/rock fragments	0.50
	Rock fragment content	0.22				
FcA:						
Fincastle	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.01
FdA:						
Fincastle	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.01
FmA:						
Fox	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
FmB:						
Fox	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
FmB2:						
Fox	Well suited		Well suited		Moderate	
					Texture/rock fragments	0.50
HeF2:						
Hennepin	Unsuited		Unsuited		High	
	Slope	1.00	Slope	1.00	Texture/slope/surface depth/rock fragments	1.00
	Stickiness	0.50				
Miamian	Unsuited		Unsuited		High	
	Slope	1.00	Slope	1.00	Texture/slope/surface depth/rock fragments	1.00
	Stickiness	0.50				
HwE2:						
Hennepin	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/surface depth/rock fragments	0.50
	Stickiness	0.50				
Wynn	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/rock fragments	0.50
	Stickiness	0.50				

Table 15.--Woodland Regeneration Activities--Continued

Map symbol and soil name	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for site preparation: Rating class and limiting features	Value	Potential for damage to soil by fire: Rating class and limiting features	Value
HwF2:						
Hennepin	Unsuited		Unsuited		High	
	Slope	1.00	Slope	1.00	Texture/slope/surface depth/rock fragments	1.00
	Stickiness	0.50				
Wynn	Unsuited		Unsuited		High	
	Slope	1.00	Slope	1.00	Texture/slope/surface depth/rock fragments	1.00
	Stickiness	0.50				
KeC2:						
Kendallville	Moderately suited		Well suited		Moderate	
	Slope	0.50			Texture/rock fragments	0.50
	Rock fragment content	0.28				
Eldean	Moderately suited		Well suited		Moderate	
	Slope	0.50			Texture/rock fragments	0.50
	Stickiness	0.50				
KeD2:						
Kendallville	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/surface depth/rock fragments	0.50
	Rock fragment content	0.28				
Eldean	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/surface depth/rock fragments	0.50
	Stickiness	0.50				
KnA:						
Kokomo	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.01
KoA:						
Kokomo	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.30
LeB:						
Lewisburg	Moderately suited		Poorly suited		Low	
	Stickiness	0.50	Stickiness	0.50	Texture/rock fragments	0.01
Celina	Moderately suited		Poorly suited		Low	
	Stickiness	0.50	Stickiness	0.50	Texture/rock fragments	0.01
LfB2:						
Lewisburg	Moderately suited		Poorly suited		Moderate	
	Stickiness	0.50	Stickiness	0.50	Texture/rock fragments	0.50

Table 15.--Woodland Regeneration Activities--Continued

Map symbol and soil name	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for site preparation: Rating class and limiting features	Value	Potential for damage to soil by fire: Rating class and limiting features	Value
Celina	Moderately suited		Poorly suited		Moderate	
	Stickiness	0.50	Stickiness	0.50	Texture/rock fragments	0.50
LgC3:						
Lewisburg	Moderately suited		Poorly suited		Moderate	
	Stickiness	0.50	Stickiness	0.50	Texture/surface depth/rock fragments	0.50
	Slope	0.50				
LpA:						
Lippincott	Well suited		Well suited		Low	
					Texture/rock fragments	0.30
MaA:						
Medway	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
MbB2:						
Miami	Well suited		Well suited		Moderate	
					Texture/rock fragments	0.50
McE2:						
Miami	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/rock fragments	0.50
Kendallville	Poorly suited		Poorly suited		Low	
	Slope	0.75	Slope	0.75	Texture/rock fragments	0.01
	Rock fragment content	0.05				
McF2:						
Miami	Unsuited		Unsuited		High	
	Slope	1.00	Slope	1.00	Texture/slope/surface depth/rock fragments	1.00
Kendallville	Unsuited		Unsuited		Moderate	
	Slope	1.00	Slope	1.00	Texture/slope/surface depth/rock fragments	0.50
MdC2:						
Miami	Moderately suited		Well suited		Moderate	
	Slope	0.50			Texture/rock fragments	0.50
MdD2:						
Miami	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/rock fragments	0.50

Table 15.--Woodland Regeneration Activities--Continued

Map symbol and soil name	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for site preparation: Rating class and limiting features	Value	Potential for damage to soil by fire: Rating class and limiting features	Value
MeC:						
Miamian	Moderately suited		Poorly suited		Low	
	Stickiness	0.50	Stickiness	0.50	Texture/rock fragments	0.01
	Slope	0.50				
MeC2:						
Miamian	Moderately suited		Well suited		Moderate	
	Slope	0.50			Texture/rock fragments	0.50
	Stickiness	0.50				
MeD2:						
Miamian	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/rock fragments	0.50
	Stickiness	0.50				
MfB:						
Miamian	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.01
Celina	Moderately suited		Poorly suited		Low	
	Stickiness	0.50	Stickiness	0.50	Texture/rock fragments	0.01
MfB2:						
Miamian	Moderately suited		Well suited		Moderate	
	Stickiness	0.50			Texture/rock fragments	0.50
Celina	Moderately suited		Poorly suited		Moderate	
	Stickiness	0.50	Stickiness	0.50	Texture/rock fragments	0.50
MgE2:						
Miamian	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/surface depth/rock fragments	0.50
	Stickiness	0.50				
Kendallville	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/surface depth/rock fragments	0.50
	Rock fragment content	0.05				
MgF2:						
Miamian	Unsuited		Unsuited		Moderate	
	Slope	1.00	Slope	1.00	Texture/slope/rock fragments	0.70
	Stickiness	0.50				
Kendallville	Unsuited		Unsuited		High	
	Slope	1.00	Slope	1.00	Texture/slope/surface depth/rock fragments	1.00
	Rock fragment content	0.05				

Table 15.--Woodland Regeneration Activities--Continued

Map symbol and soil name	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for site preparation: Rating class and limiting features	Value	Potential for damage to soil by fire: Rating class and limiting features	Value
MhC3:						
Miamian	Moderately suited		Well suited		Moderate	
	Slope	0.50			Texture/surface depth/rock fragments	0.50
	Stickiness	0.50				
Losantville	Moderately suited		Well suited		Moderate	
	Stickiness	0.50			Texture/surface depth/rock fragments	0.50
	Slope	0.50				
MhD3:						
Miamian	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/surface depth/rock fragments	0.50
	Stickiness	0.50				
Losantville	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/surface depth/rock fragments	0.50
	Stickiness	0.50				
MmE2:						
Miamian	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/surface depth/rock fragments	0.50
	Stickiness	0.50				
Hennepin	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/surface depth/rock fragments	0.50
	Stickiness	0.50				
MnE3:						
Miamian	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/surface depth/rock fragments	0.50
	Stickiness	0.50				
Hennepin	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/surface depth/rock fragments	0.50
	Stickiness	0.50				
MpA:						
Milford	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.30
MrA:						
Milford	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.30

Table 15.--Woodland Regeneration Activities--Continued

Map symbol and soil name	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for site preparation: Rating class and limiting features	Value	Potential for damage to soil by fire: Rating class and limiting features	Value
MsA:						
Millsdale	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.01
MtA:						
Millsdale	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.30
MuA:						
Milton	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.01
MuB:						
Milton	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.01
MuB2:						
Milton	Moderately suited		Poorly suited		Moderate	
	Stickiness	0.50	Stickiness	0.50	Texture/rock fragments	0.50
MuC2:						
Milton	Moderately suited		Poorly suited		Moderate	
	Stickiness	0.50	Stickiness	0.50	Texture/surface depth/rock fragments	0.50
	Slope	0.50				
MuD2:						
Milton	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/rock fragments	0.50
	Stickiness	0.50	Stickiness	0.50		
MuE2:						
Milton	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/surface depth/rock fragments	0.50
	Stickiness	0.50	Stickiness	0.50		
MwA:						
Morningsun	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
MxA:						
Morningsun	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
Xenia	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.01
MxB:						
Morningsun	Well suited		Well suited		Low	
					Texture/rock fragments	0.01

Table 15.--Woodland Regeneration Activities--Continued

Map symbol and soil name	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for site preparation: Rating class and limiting features	Value	Potential for damage to soil by fire: Rating class and limiting features	Value
Xenia	Moderately suited Stickiness	0.50	Well suited		Low Texture/rock fragments	0.01
MxB2:						
Morningsun	Well suited		Well suited		Moderate Texture/rock fragments	0.50
Xenia	Moderately suited Stickiness	0.50	Well suited		Moderate Texture/rock fragments	0.50
MyA:						
Mahalasville	Moderately suited Stickiness	0.50	Poorly suited Stickiness	0.50	Low Texture/rock fragments	0.01
OcA:						
Ockley	Well suited		Well suited		Moderate Texture/rock fragments	0.50
OcB:						
Ockley	Well suited		Well suited		Moderate Texture/rock fragments	0.50
Pg:						
Pits, Gravel	Not rated		Not rated		Not rated	
Pq:						
Pits, Quarry	Not rated		Not rated		Not rated	
PtB:						
Plattville	Well suited		Well suited		Low Texture/rock fragments	0.01
RaA:						
Rainsville	Well suited		Well suited		Low Texture/rock fragments	0.01
RaB:						
Rainsville	Well suited		Well suited		Low Texture/rock fragments	0.01
RaB2:						
Rainsville	Well suited		Well suited		Moderate Texture/rock fragments	0.50
RcA:						
Randolph	Moderately suited Stickiness	0.50	Poorly suited Stickiness	0.50	Low Texture/rock fragments	0.01

Table 15.--Woodland Regeneration Activities--Continued

Map symbol and soil name	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for site preparation: Rating class and limiting features	Value	Potential for damage to soil by fire: Rating class and limiting features	Value
RcB:						
Randolph	Moderately suited		Poorly suited		Low	
	Stickiness	0.50	Stickiness	0.50	Texture/rock fragments	0.01
RnE2:						
Rodman	Poorly suited		Poorly suited		Low	
	Slope	0.75	Slope	0.75	Texture/rock fragments	0.01
	Rock fragment content	0.25	Rock fragment content	0.50		
RnF2:						
Rodman	Unsuited		Unsuited		Moderate	
	Slope	1.00	Slope	1.00	Texture/slope/surface depth/rock fragments	0.50
	Rock fragment content	0.69	Rock fragment content	0.50		
RoE2:						
Rodman	Poorly suited		Poorly suited		Low	
	Slope	0.75	Slope	0.75	Texture/rock fragments	0.01
	Rock fragment content	0.69	Rock fragment content	0.50		
Kendallville	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/rock fragments	0.50
RoF2:						
Rodman	Unsuited		Unsuited		Moderate	
	Slope	1.00	Slope	1.00	Texture/slope/surface depth/rock fragments	0.50
	Rock fragment content	0.69	Rock fragment content	0.50		
Kendallville	Unsuited		Unsuited		Moderate	
	Slope	1.00	Slope	1.00	Texture/slope/rock fragments	0.70
	Rock fragment content	0.05				
RpA:						
Rossburg	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
RuB:						
Russell	Moderately suited		Well suited		Moderate	
	Stickiness	0.50			Texture/rock fragments	0.50
Miamian	Moderately suited		Poorly suited		Low	
	Stickiness	0.50	Stickiness	0.50	Texture/rock fragments	0.01

Table 15.--Woodland Regeneration Activities--Continued

Map symbol and soil name	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for site preparation: Rating class and limiting features	Value	Potential for damage to soil by fire: Rating class and limiting features	Value
RuB2:						
Russell	Moderately suited		Well suited		Moderate	
	Stickiness	0.50			Texture/rock fragments	0.50
Miamian	Moderately suited		Well suited		Moderate	
	Stickiness	0.50			Texture/surface depth/rock fragments	0.50
SeA:						
Savona	Moderately suited		Well suited		Moderate	
	Stickiness	0.50			Texture/rock fragments	0.50
	Rock fragment content	0.14				
SnA:						
Sloan	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
StA:						
Stonelick	Well suited		Well suited		Moderate	
					Texture/rock fragments	0.50
SvA:						
Sugarvalley	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
SwA:						
Sugarvalley	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
Fincastle	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.01
ThA:						
Thackery	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
ThB:						
Thackery	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
Ud:						
Udorthents	Not rated		Not rated		Not rated	
W:						
Water	Not rated		Not rated		Not rated	
WbA:						
Warsaw	Well suited		Well suited		Low	
					Texture/rock fragments	0.01

Table 15.--Woodland Regeneration Activities--Continued

Map symbol and soil name	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for site preparation: Rating class and limiting features	Value	Potential for damage to soil by fire: Rating class and limiting features	Value
WnA:						
Westland	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
WyB:						
Wynn	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.01
WyB2:						
Wynn	Moderately suited		Well suited		Moderate	
	Stickiness	0.50			Texture/rock fragments	0.50
WyC2:						
Wynn	Moderately suited		Well suited		Moderate	
	Stickiness	0.50			Texture/rock fragments	0.50
	Slope	0.50				
WyD2:						
Wynn	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/rock fragments	0.50
	Stickiness	0.50				
XeA:						
Xenia	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.01
XeB:						
Xenia	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.01
XeB2:						
Xenia	Moderately suited		Well suited		Moderate	
	Stickiness	0.50			Texture/rock fragments	0.50
XfB:						
Xenia	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.01

TABLE 16.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS

(Absence of an entry indicates that trees generally do not grow to the given height. See text on page 202 for additional information.)

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
CeA:					
Celina	silky dogwood	American cranberrybush	American witchhazel; blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine
CeB:					
Celina	silky dogwood	American cranberrybush	American witchhazel; blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine
CeB2:					
Celina	silky dogwood	American cranberrybush	American witchhazel; blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine
CoA:					
Corwin	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
CtA:					
Crosby	American cranberrybush	southern arrowwood	Austrian pine; eastern redcedar; green ash; osageorange; Washington hawthorn	eastern white pine	pin oak
Celina	silky dogwood	American cranberrybush	American witchhazel; blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine
CtB:					
Crosby	American cranberrybush	southern arrowwood	Austrian pine; eastern redcedar; green ash; osageorange; Washington hawthorn	eastern white pine	pin oak
Celina	silky dogwood	American cranberrybush	American witchhazel; blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine
CvA:					
Crosby	American cranberrybush	southern arrowwood	Austrian pine; eastern redcedar; green ash; osageorange; Washington hawthorn	eastern white pine	pin oak
Lewisburg	silky dogwood	American cranberrybush	American witchhazel; blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine
CyA:					
Cyclone	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern white-cedar; Washington hawthorn; white fir	eastern white pine; Norway spruce	pin oak

Table 16.--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
DaA:					
Dana	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
DaB:					
Dana	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
EeA:					
Eel	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
EgA:					
Eldean	common lilac; Siberian peashrub	eastern redcedar; radiant crabapple; Washington hawthorn	Austrian pine; eastern white pine; jack pine; red pine	---	---
EgB:					
Eldean	common lilac; Siberian peashrub	eastern redcedar; radiant crabapple; Washington hawthorn	Austrian pine; eastern white pine; jack pine; red pine	---	---
EgB2:					
Eldean	common lilac; Siberian peashrub	eastern redcedar; radiant crabapple; Washington hawthorn	Austrian pine; eastern white pine; jack pine; red pine	---	---
EhC3:					
Eldean	common lilac; Siberian peashrub	eastern redcedar; radiant crabapple; Washington hawthorn	Austrian pine; eastern white pine; jack pine; red pine	---	---
EhD3:					
Eldean	common lilac; Siberian peashrub	eastern redcedar; radiant crabapple; Washington hawthorn	Austrian pine; eastern white pine; jack pine; red pine	---	---
EkA:					
Eldean	common lilac; Siberian peashrub	eastern redcedar; radiant crabapple; Washington hawthorn	Austrian pine; eastern white pine; jack pine; red pine	---	---
EkB:					
Eldean	common lilac; Siberian peashrub	eastern redcedar; radiant crabapple; Washington hawthorn	Austrian pine; eastern white pine; jack pine; red pine	---	---
EkB2:					
Eldean	common lilac; Siberian peashrub	eastern redcedar; radiant crabapple; Washington hawthorn	Austrian pine; eastern white pine; jack pine; red pine	---	---
FcA:					
Fincastle	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
FdA:					
Fincastle	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
FmA:					
Fox	common lilac; Siberian peashrub	American hazelnut; eastern redcedar; radiant crabapple; southern arrowwood; Washington hawthorn	American plum; Austrian pine; eastern white pine; serviceberry; Virginia pine	---	---

Table 16.--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
FmB:					
Fox	common lilac; Siberian peashrub	American hazelnut; eastern redcedar; radiant crabapple; southern arrowwood; Washington hawthorn	American plum; Austrian pine; eastern white pine; serviceberry; Virginia pine	---	---
FmB2:					
Fox	common lilac; Siberian peashrub	American hazelnut; eastern redcedar; radiant crabapple; southern arrowwood; Washington hawthorn	American plum; Austrian pine; eastern white pine; serviceberry; Virginia pine	---	---
HeF2:					
Hennepin	silky dogwood	American cranberrybush; American hazelnut; southern arrowwood	American plum; northern white-cedar; serviceberry; Washington hawthorn	Austrian pine; Norway spruce	eastern white pine
Miamian	silky dogwood	American cranberrybush; American hazelnut; southern arrowwood	American plum; northern white-cedar; serviceberry; Washington hawthorn	Austrian pine; Norway spruce	eastern white pine
HwE2:					
Hennepin	silky dogwood	American cranberrybush; American hazelnut; southern arrowwood	American plum; northern white-cedar; serviceberry; Washington hawthorn	Austrian pine; Norway spruce	eastern white pine
Wynn	common lilac; Siberian peashrub	eastern redcedar; radiant crabapple; Washington hawthorn	Austrian pine; eastern white pine; jack pine; red pine	---	---
HwF2:					
Hennepin	silky dogwood	American cranberrybush; American hazelnut; southern arrowwood	American plum; northern white-cedar; serviceberry; Washington hawthorn	Austrian pine; Norway spruce	eastern white pine
Wynn	common lilac; Siberian peashrub	eastern redcedar; radiant crabapple; Washington hawthorn	Austrian pine; eastern white pine; jack pine; red pine	---	---
KeC2:					
Kendallville	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
Eldean	common lilac; Siberian peashrub	eastern redcedar; radiant crabapple; Washington hawthorn	Austrian pine; eastern white pine; jack pine; red pine	---	---
KeD2:					
Kendallville	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
Eldean	common lilac; Siberian peashrub	eastern redcedar; radiant crabapple; Washington hawthorn	Austrian pine; eastern white pine; jack pine; red pine	---	---
KnA:					
Kokomo	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern white-cedar; Washington hawthorn; white fir	eastern white pine; Norway spruce	pin oak

Table 16.--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
KoA:					
Kokomo	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern white-cedar; Washington hawthorn; white fir	eastern white pine; Norway spruce	pin oak
LeB:					
Lewisburg	Siberian peashrub	eastern redcedar; jack pine; osageorange; Russian olive; Washington hawthorn	honeylocust; northern catalpa	---	---
Celina	silky dogwood	American cranberrybush	American witchhazel; blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine
LfB2:					
Lewisburg	Siberian peashrub	eastern redcedar; jack pine; osageorange; Russian olive; Washington hawthorn	honeylocust; northern catalpa	---	---
Celina	silky dogwood	American cranberrybush	American witchhazel; blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine
LgC3:					
Lewisburg	Siberian peashrub	eastern redcedar; jack pine; osageorange; Russian olive; Washington hawthorn	honeylocust; northern catalpa	---	---
LpA:					
Lippincott	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern white-cedar; Washington hawthorn; white fir	eastern white pine; Norway spruce	pin oak
MaA:					
Medway	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine
MbB2:					
Miami	American cranberrybush; common juniper; coralberry; gray dogwood; silky dogwood	blackhaw; hazelnut; nannyberry; prairie crabapple; roughleaf dogwood; smooth sumac; southern arrowwood; staghorn sumac	American plum; eastern redcedar; northern white-cedar; serviceberry; Washington hawthorn	black oak; blackgum; common hackberry; green ash; Norway spruce; Virginia pine	eastern cottonwood; eastern white pine; imperial Carolina poplar
McE2:					
Miami	American cranberrybush; common juniper; coralberry; gray dogwood; silky dogwood	blackhaw; hazelnut; nannyberry; prairie crabapple; roughleaf dogwood; smooth sumac; southern arrowwood; staghorn sumac	American plum; eastern redcedar; northern white-cedar; serviceberry; Washington hawthorn	black oak; blackgum; common hackberry; green ash; Norway spruce; Virginia pine	eastern cottonwood; eastern white pine; imperial Carolina poplar
Kendallville	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak

Table 16.--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
McF2:					
Miami	American cranberrybush; common juniper; coralberry; gray dogwood; silky dogwood	blackhaw; hazelnut; nannyberry; prairie crabapple; roughleaf dogwood; smooth sumac; southern arrowwood; staghorn sumac	American plum; eastern redcedar; northern white-cedar; serviceberry; Washington hawthorn	black oak; blackgum; common hackberry; green ash; Norway spruce; Virginia pine	eastern cottonwood; eastern white pine; imperial Carolina poplar
Kendallville	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
MdC2:					
Miami	American cranberrybush; common juniper; coralberry; gray dogwood; silky dogwood	blackhaw; hazelnut; nannyberry; prairie crabapple; roughleaf dogwood; smooth sumac; southern arrowwood; staghorn sumac	American plum; eastern redcedar; northern white-cedar; serviceberry; Washington hawthorn	black oak; blackgum; common hackberry; green ash; Norway spruce; Virginia pine	eastern cottonwood; eastern white pine; imperial Carolina poplar
MdD2:					
Miami	American cranberrybush; common juniper; coralberry; gray dogwood; silky dogwood	blackhaw; hazelnut; nannyberry; prairie crabapple; roughleaf dogwood; smooth sumac; southern arrowwood; staghorn sumac	American plum; eastern redcedar; northern white-cedar; serviceberry; Washington hawthorn	black oak; blackgum; common hackberry; green ash; Norway spruce; Virginia pine	eastern cottonwood; eastern white pine; imperial Carolina poplar
MeC:					
Miamian	silky dogwood	American cranberrybush; American hazelnut; southern arrowwood	American plum; blue spruce; northern white-cedar; serviceberry; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine
MeC2:					
Miamian	silky dogwood	American cranberrybush; American hazelnut; southern arrowwood	American plum; blue spruce; northern white-cedar; serviceberry; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine
MeD2:					
Miamian	silky dogwood	American cranberrybush; American hazelnut; southern arrowwood	American plum; blue spruce; northern white-cedar; serviceberry; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine
MfB:					
Miamian	silky dogwood	American cranberrybush; American hazelnut; southern arrowwood	American plum; blue spruce; northern white-cedar; serviceberry; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine
Celina	silky dogwood	American cranberrybush	American witchhazel; blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine
MfB2:					
Miamian	silky dogwood	American cranberrybush; American hazelnut; southern arrowwood	American plum; blue spruce; northern white-cedar; serviceberry; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine

Table 16.--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
Celina	silky dogwood	American cranberrybush	American witchhazel; blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine
MgE2:					
Miamian	silky dogwood	American cranberrybush; American hazelnut; southern arrowwood	American plum; blue spruce; northern white-cedar; serviceberry; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine
Kendallville	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
MgF2:					
Miamian	silky dogwood	American cranberrybush; American hazelnut; southern arrowwood	American plum; blue spruce; northern white-cedar; serviceberry; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine
Kendallville	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
MhC3:					
Miamian	silky dogwood	American cranberrybush; American hazelnut; southern arrowwood	American plum; blue spruce; northern white-cedar; serviceberry; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine
Losantville	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
MhD3:					
Miamian	silky dogwood	American cranberrybush; American hazelnut; southern arrowwood	American plum; blue spruce; northern white-cedar; serviceberry; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine
Losantville	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
MmE2:					
Miamian	silky dogwood	American cranberrybush; American hazelnut; southern arrowwood	American plum; blue spruce; northern white-cedar; serviceberry; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine
Hennepin	silky dogwood	American cranberrybush; American hazelnut; southern arrowwood	American plum; northern white-cedar; serviceberry; Washington hawthorn	Austrian pine; Norway spruce	eastern white pine

Table 16.--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
MnE3:					
Miamian	silky dogwood	American cranberrybush; American hazelnut; southern arrowwood	American plum; blue spruce; northern white-cedar; serviceberry; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine
Hennepin	silky dogwood	American cranberrybush; American hazelnut; southern arrowwood	American plum; northern white-cedar; serviceberry; Washington hawthorn	Austrian pine; Norway spruce	eastern white pine
MpA:					
Milford	American elder; black chokeberry; buttonbush; common winterberry; gray dogwood; highbush blueberry; highbush cranberry; ninebark; redosier dogwood; silky dogwood; spicebush	cockspur hawthorn; hazel alder; nannyberry; roughleaf dogwood	green hawthorn; hackberry; northern white-cedar; shingle oak	blackgum; Norway spruce; river birch; swamp white oak; sweetgum	eastern cottonwood; green ash; imperial Carolina poplar; pin oak; red maple
MrA:					
Milford	American elder; black chokeberry; buttonbush; common winterberry; gray dogwood; highbush blueberry; highbush cranberry; ninebark; redosier dogwood; silky dogwood; spicebush	cockspur hawthorn; hazel alder; nannyberry; roughleaf dogwood	green hawthorn; hackberry; northern white-cedar; shingle oak	blackgum; Norway spruce; river birch; swamp white oak; sweetgum	eastern cottonwood; green ash; imperial Carolina poplar; pin oak; red maple
MsA:					
Millsdale	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern white-cedar; Washington hawthorn; white fir	eastern white pine; Norway spruce	---
MtA:					
Millsdale	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern white-cedar; Washington hawthorn; white fir	eastern white pine; Norway spruce	---
MuA:					
Milton	common lilac; Siberian peashrub	eastern redcedar; radiant crabapple; Washington hawthorn	Austrian pine; eastern white pine; jack pine; red pine	---	---
MuB:					
Milton	common lilac; Siberian peashrub	eastern redcedar; radiant crabapple; Washington hawthorn	Austrian pine; eastern white pine; jack pine; red pine	---	---
MuB2:					
Milton	common lilac; Siberian peashrub	eastern redcedar; radiant crabapple; Washington hawthorn	Austrian pine; eastern white pine; jack pine; red pine	---	---
MuC2:					
Milton	common lilac; Siberian peashrub	eastern redcedar; radiant crabapple; Washington hawthorn	Austrian pine; eastern white pine; jack pine; red pine	---	---
MuD2:					
Milton	common lilac; Siberian peashrub	eastern redcedar; radiant crabapple; Washington hawthorn	Austrian pine; eastern white pine; jack pine; red pine	---	---

Table 16.--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
MuE2:					
Milton	common lilac; Siberian peashrub	eastern redcedar; radiant crabapple; Washington hawthorn	Austrian pine; eastern white pine; jack pine; red pine	---	---
MwA:					
Morningsun	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
MxA:					
Morningsun	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
Xenia	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
MxB:					
Morningsun	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
Xenia	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
MxB2:					
Morningsun	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
Xenia	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
MyA:					
Mahalasville	American elder; black chokeberry; buttonbush; gray dogwood; highbush cranberry; ninebark; redosier dogwood; silky dogwood; spicebush	cockspur hawthorn; hazel alder; nannyberry; roughleaf dogwood	green hawthorn; hackberry; northern white-cedar; shingle oak	blackgum; bur oak; green ash; Norway spruce; pin oak; swamp white oak	eastern cottonwood; imperial Carolina poplar; red maple; river birch; silver maple
OcA:					
Ockley	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
OcB:					
Ockley	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
Pg:					
Pits, gravel	---	---	---	---	---
Pq:					
Pits, quarry	---	---	---	---	---
PtB:					
Plattville	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak

Table 16.--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
RaA:					
Rainsville	American elder; black chokeberry; common juniper; common winterberry; coralberry; gray dogwood; highbush cranberry; ninebark; redosier dogwood; silky dogwood; spicebush	arrowwood; blackhaw; hazelnut; nannyberry; roughleaf dogwood; shining sumac; smooth sumac; staghorn sumac; wild sweet crab; witchhazel	American plum; common persimmon; eastern redcedar; hackberry; northern white-cedar; pecan; prairie crabapple; serviceberry; Washington hawthorn	black cherry; black walnut; blackgum; green ash; northern red oak; Norway spruce; pin oak; red pine; tuliptree; white oak; baldcypress	eastern cottonwood; eastern white pine; imperial Carolina poplar; cherrybark oak
RaB:					
Rainsville	American elder; black chokeberry; common juniper; common winterberry; coralberry; gray dogwood; highbush cranberry; ninebark; redosier dogwood; silky dogwood; spicebush	arrowwood; blackhaw; hazelnut; nannyberry; roughleaf dogwood; shining sumac; smooth sumac; staghorn sumac; wild sweet crab; witchhazel	American plum; common persimmon; eastern redcedar; hackberry; northern white-cedar; pecan; prairie crabapple; serviceberry; Washington hawthorn	black cherry; black walnut; blackgum; green ash; northern red oak; Norway spruce; pin oak; red pine; tuliptree; white oak; baldcypress	eastern cottonwood; eastern white pine; imperial Carolina poplar; cherrybark oak
RaB2:					
Rainsville	American elder; black chokeberry; common juniper; common winterberry; coralberry; gray dogwood; highbush cranberry; ninebark; redosier dogwood; silky dogwood; spicebush	arrowwood; blackhaw; hazelnut; nannyberry; roughleaf dogwood; shining sumac; smooth sumac; staghorn sumac; wild sweet crab; witchhazel	American plum; common persimmon; eastern redcedar; hackberry; northern white-cedar; pecan; prairie crabapple; serviceberry; Washington hawthorn	black cherry; black walnut; blackgum; green ash; northern red oak; Norway spruce; pin oak; red pine; tuliptree; white oak; baldcypress	eastern cottonwood; eastern white pine; imperial Carolina poplar; cherrybark oak
RcA:					
Randolph	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
RcB:					
Randolph	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
RnE2:					
Rodman	gray dogwood; Siberian peashrub; silky dogwood	eastern redcedar; radiant crabapple; Washington hawthorn	black locust; jack pine; Virginia pine	---	---
RnF2:					
Rodman	gray dogwood; Siberian peashrub; silky dogwood	eastern redcedar; radiant crabapple; Washington hawthorn	black locust; jack pine; Virginia pine	---	---
RoE2:					
Rodman	gray dogwood; Siberian peashrub; silky dogwood	eastern redcedar; radiant crabapple; Washington hawthorn	black locust; jack pine; Virginia pine	---	---
Kendallville	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
RoF2:					
Rodman	gray dogwood; Siberian peashrub; silky dogwood	eastern redcedar; radiant crabapple; Washington hawthorn	black locust; jack pine; Virginia pine	---	---
Kendallville	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak

Table 16.--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
RpA:					
Rossburg	silky dogwood	American cranberrybush; American hazelnut; southern arrowwood	blue spruce; northern white-cedar; serviceberry; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
RuB:					
Russell	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
Miamian	silky dogwood	American cranberrybush; American hazelnut; southern arrowwood	American plum; blue spruce; northern white-cedar; serviceberry; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine
RuB2:					
Russell	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
Miamian	silky dogwood	American cranberrybush; American hazelnut; southern arrowwood	American plum; blue spruce; northern white-cedar; serviceberry; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine
SeA:					
Savona	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
SnA:					
Sloan	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern white-cedar; Washington hawthorn; white fir	eastern white pine; Norway spruce	pin oak
StA:					
Stonelick	silky dogwood	Siberian peashrub	blue spruce; eastern redcedar; nannyberry; osageorange; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine
SvA:					
Sugarvalley	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
SwA:					
Sugarvalley	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
Fincastle	silky dogwood	American cranberrybush; redosier dogwood	American witchhazel; blue spruce; nannyberry; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak

Table 16.--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
ThA: Thackery	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
ThB: Thackery	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
Ud: Udorthents	---	---	---	---	---
W: Water	---	---	---	---	---
WbA: Warsaw	common lilac; Siberian peashrub	eastern redcedar; radiant crabapple; Washington hawthorn	Austrian pine; eastern white pine; jack pine; red pine	---	---
WnA: Westland	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern white-cedar; Washington hawthorn; white fir	eastern white pine; Norway spruce	pin oak
WyB: Wynn	common lilac; Siberian peashrub	eastern redcedar; radiant crabapple; Washington hawthorn	Austrian pine; eastern white pine; jack pine; red pine	---	---
WyB2: Wynn	common lilac; Siberian peashrub	eastern redcedar; radiant crabapple; Washington hawthorn	Austrian pine; eastern white pine; jack pine; red pine	---	---
WyC2: Wynn	common lilac; Siberian peashrub	eastern redcedar; radiant crabapple; Washington hawthorn	Austrian pine; eastern white pine; jack pine; red pine	---	---
WyD2: Wynn	common lilac; Siberian peashrub	eastern redcedar; radiant crabapple; Washington hawthorn	Austrian pine; eastern white pine; jack pine; red pine	---	---
XeA: Xenia	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
XeB: Xenia	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
XeB2: Xenia	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
XfB: Xenia	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak

TABLE 17.—RECREATION PART 1

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text on page 202 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
CeA:						
Celina	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.10	Depth to saturated zone	0.05	Depth to saturated zone	0.10
CeB:						
Celina	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.10	Depth to saturated zone	0.05	Slope	0.50
					Depth to saturated zone	0.10
CeB2:						
Celina	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.10	Depth to saturated zone	0.05	Slope	0.50
					Depth to saturated zone	0.10
CoA:						
Corwin	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
	Depth to saturated zone	0.47	Depth to saturated zone	0.21	Depth to saturated zone	0.47
CtA:						
Crosby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.98	Restricted permeability	0.98	Restricted permeability	0.98
Celina	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.10	Depth to saturated zone	0.05	Depth to saturated zone	0.10
CtB:						
Crosby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.98	Restricted permeability	0.98	Restricted permeability	0.98
					Slope	0.13

TABLE 17.—RECREATION PART 1--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
Celina	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.10	Depth to saturated zone	0.05	Slope	0.13
					Depth to saturated zone	0.10
CvA:						
Crosby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.98	Restricted permeability	0.98	Restricted permeability	0.98
Lewisburg	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Restricted permeability	0.96	Depth to saturated zone	1.00
	Restricted permeability	0.96	Depth to saturated zone	0.79	Restricted permeability	0.96
CyA:						
Cyclone	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
DaA:						
Dana	Not limited		Not limited		Not limited	
DaB:						
Dana	Not limited		Not limited		Somewhat limited	
					Slope	0.50
EeA:						
Eel	Very limited		Somewhat limited		Somewhat limited	
	Flooding	1.00	Depth to saturated zone	0.46	Depth to saturated zone	0.83
	Depth to saturated zone	0.83			Flooding	0.60
EgA:						
Eldean	Somewhat limited		Somewhat limited		Very limited	
	Gravel content	0.04	Gravel content	0.04	Gravel content	1.00
					Content of large stones	0.01
EgB:						
Eldean	Somewhat limited		Somewhat limited		Very limited	
	Gravel content	0.04	Gravel content	0.04	Gravel content	1.00
					Slope	0.50
					Content of large stones	0.01
EgB2:						
Eldean	Somewhat limited		Somewhat limited		Very limited	
	Gravel content	0.04	Gravel content	0.04	Gravel content	1.00
					Slope	0.50
					Content of large stones	0.01

TABLE 17.—RECREATION PART 1--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
EhC3:						
Eldean	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.16	Slope	0.16	Slope	1.00
	Gravel content	0.04	Gravel content	0.04	Gravel content	1.00
					Content of large stones	0.01
EhD3:						
Eldean	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.99	Slope	0.99	Slope	1.00
	Gravel content	0.04	Gravel content	0.04	Gravel content	1.00
					Content of large stones	0.01
EkA:						
Eldean	Not limited		Not limited		Not limited	
EkB:						
Eldean	Not limited		Not limited		Somewhat limited	
					Slope	0.50
EkB2:						
Eldean	Not limited		Not limited		Somewhat limited	
					Slope	0.50
FcA:						
Fincastle	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	0.21	Restricted permeability	0.21	Restricted permeability	0.21
FdA:						
Fincastle	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	0.21	Restricted permeability	0.21	Restricted permeability	0.21
FmA:						
Fox	Not limited		Not limited		Not limited	
FmB:						
Fox	Not limited		Not limited		Somewhat limited	
					Slope	0.50
FmB2:						
Fox	Not limited		Not limited		Somewhat limited	
					Slope	0.50
HeF2:						
Hennepin	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96

TABLE 17.—RECREATION PART 1--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
HwE2:						
Hennepin	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
Wynn	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Depth to bedrock	0.46
					Restricted permeability	0.21
HwF2:						
Hennepin	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
Wynn	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Depth to bedrock	0.90
					Restricted permeability	0.21
KeC2:						
Kendallville	Somewhat limited		Somewhat limited		Very limited	
	Restricted permeability	0.21	Restricted permeability	0.21	Slope	1.00
	Slope	0.16	Slope	0.16	Restricted permeability	0.21
Eldean	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.16	Slope	0.16	Slope	1.00
KeD2:						
Kendallville	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.99	Slope	0.99	Slope	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
Eldean	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.99	Slope	0.99	Slope	1.00
KnA:						
Kokomo	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
KoA:						
Kokomo	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21

TABLE 17.—RECREATION PART 1--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
LeB:						
Lewisburg	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Restricted permeability	0.96	Depth to saturated zone	1.00
	Restricted permeability	0.96	Depth to saturated zone	0.79	Restricted permeability	0.96
					Slope	0.50
Celina	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.10	Depth to saturated zone	0.05	Slope	0.50
					Depth to saturated zone	0.10
LfB2:						
Lewisburg	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Restricted permeability	0.96	Depth to saturated zone	1.00
	Restricted permeability	0.96	Depth to saturated zone	0.79	Restricted permeability	0.96
					Slope	0.50
Celina	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.10	Depth to saturated zone	0.05	Slope	0.50
					Depth to saturated zone	0.10
LgC3:						
Lewisburg	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Restricted permeability	0.96	Depth to saturated zone	1.00
	Restricted permeability	0.96	Depth to saturated zone	0.79	Slope	1.00
	Slope	0.16	Slope	0.16	Restricted permeability	0.96
LpA:						
Lippincott	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
MaA:						
Medway	Very limited		Not limited		Somewhat limited	
	Flooding	1.00			Flooding	0.60
MbB2:						
Miami	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
					Slope	0.55
McE2:						
Miami	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00

TABLE 17.—RECREATION PART 1--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
McF2:						
Miami	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
MdC2:						
Miami	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Slope	1.00
	Slope	0.16	Slope	0.16	Restricted permeability	1.00
MdD2:						
Miami	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Slope	1.00
	Slope	0.99	Slope	0.99	Restricted permeability	1.00
MeC:						
Miamian	Somewhat limited		Somewhat limited		Very limited	
	Restricted permeability	0.96	Restricted permeability	0.96	Slope	1.00
	Slope	0.16	Slope	0.16	Restricted permeability	0.96
MeC2:						
Miamian	Somewhat limited		Somewhat limited		Very limited	
	Restricted permeability	0.96	Restricted permeability	0.96	Slope	1.00
	Slope	0.16	Slope	0.16	Restricted permeability	0.96
MeD2:						
Miamian	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.99	Slope	0.99	Slope	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
MfB:						
Miamian	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
					Slope	0.50
Celina	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.10	Depth to saturated zone	0.05	Slope	0.50
					Depth to saturated zone	0.10

TABLE 17.—RECREATION PART 1--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
MfB2:						
Miamian	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
					Slope	0.50
Celina	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.10	Depth to saturated zone	0.05	Slope	0.50
					Depth to saturated zone	0.10
MgE2:						
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
MgF2:						
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
MhC3:						
Miamian	Somewhat limited		Somewhat limited		Very limited	
	Restricted permeability	0.96	Restricted permeability	0.96	Slope	1.00
	Slope	0.16	Slope	0.16	Restricted permeability	0.96
Losantville	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Restricted permeability	0.98	Slope	1.00
	Restricted permeability	0.98	Depth to saturated zone	0.76	Depth to saturated zone	1.00
	Slope	0.16	Slope	0.16	Restricted permeability	0.98
MhD3:						
Miamian	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.99	Slope	0.99	Slope	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96

TABLE 17.—RECREATION PART 1--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
MmE2:						
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
Hennepin	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
MnE3:						
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
Hennepin	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
MpA:						
Milford	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
MrA:						
Milford	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
MsA:						
Millsdale	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
MtA:						
Millsdale	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
MuA:						
Milton	Not limited		Not limited		Not limited	
MuB:						
Milton	Not limited		Not limited		Somewhat limited	
					Depth to bedrock	0.65
					Slope	0.50

TABLE 17.—RECREATION PART 1--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
MuB2:						
Milton	Not limited		Not limited		Somewhat limited	
					Depth to bedrock	0.65
					Slope	0.50
MuC2:						
Milton	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.16	Slope	0.16	Slope	1.00
					Depth to bedrock	0.65
MuD2:						
Milton	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.99	Slope	0.99	Slope	1.00
					Depth to bedrock	0.54
MuE2:						
Milton	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
					Depth to bedrock	0.95
MwA:						
Morningsun	Not limited		Not limited		Not limited	
MxA:						
Morningsun	Not limited		Not limited		Not limited	
Xenia	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.47	Restricted permeability	0.21	Depth to saturated zone	0.47
	Restricted permeability	0.21	Depth to saturated zone	0.21	Restricted permeability	0.21
MxB:						
Morningsun	Not limited		Not limited		Somewhat limited	
					Slope	0.50
Xenia	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.47	Restricted permeability	0.21	Slope	0.50
	Restricted permeability	0.21	Depth to saturated zone	0.21	Depth to saturated zone	0.47
					Restricted permeability	0.21
MxB2:						
Morningsun	Not limited		Not limited		Somewhat limited	
					Slope	0.50
Xenia	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.47	Restricted permeability	0.21	Slope	0.50
	Restricted permeability	0.21	Depth to saturated zone	0.21	Depth to saturated zone	0.47
					Restricted permeability	0.21
MyA:						
Mahalasville	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00

TABLE 17.—RECREATION PART 1--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
OcA:						
Ockley	Not limited		Not limited		Not limited	
OcB:						
Ockley	Not limited		Not limited		Somewhat limited	
					Slope	0.50
Pg:						
Pits, Gravel	Not Rated		Not Rated		Not Rated	
Pq:						
Pits, Quarry	Not Rated		Not Rated		Not Rated	
PtB:						
Plattville	Not limited		Not limited		Somewhat limited	
					Slope	0.50
RaA:						
Rainsville	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
RaB:						
Rainsville	Not limited		Not limited		Somewhat limited	
					Slope	0.55
RaB2:						
Rainsville	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.21	Restricted permeability	0.21	Slope	0.55
					Restricted permeability	0.21
RcA:						
Randolph	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	0.21	Restricted permeability	0.21	Restricted permeability	0.21
RcB:						
Randolph	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	0.21	Restricted permeability	0.21	Slope	0.50
					Depth to bedrock	0.29
					Restricted permeability	0.21
RnE2:						
Rodman	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Gravel content	0.07	Gravel content	0.07	Gravel content	1.00
RnF2:						
Rodman	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Gravel content	0.07	Gravel content	0.07	Gravel content	1.00

TABLE 17.—RECREATION PART 1--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
RoE2:						
Rodman	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Gravel content	0.07	Gravel content	0.07	Gravel content	1.00
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
RoF2:						
Rodman	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Gravel content	0.07	Gravel content	0.07	Gravel content	1.00
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
RpA:						
Rossburg	Very limited		Not limited		Somewhat limited	
	Flooding	1.00			Flooding	0.60
RuB:						
Russell	Not limited		Not limited		Somewhat limited	
					Slope	0.50
Miamian	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
					Slope	0.50
RuB2:						
Russell	Not limited		Not limited		Somewhat limited	
					Slope	0.50
Miamian	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
					Slope	0.50
SeA:						
Savona	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.79	Depth to saturated zone	1.00
SnA:						
Sloan	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Flooding	1.00	Ponding	1.00	Flooding	1.00
	Ponding	1.00	Flooding	0.40	Ponding	1.00
StA:						
Stonelick	Very limited		Somewhat limited		Very limited	
	Flooding	1.00	Flooding	0.40	Flooding	1.00
SvA:						
Sugarvalley	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.79	Depth to saturated zone	1.00

TABLE 17.—RECREATION PART 1--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
SwA:						
Sugarvalley	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.79	Depth to saturated zone	1.00
Fincastle	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
ThA:						
Thackery	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.87	Depth to saturated zone	0.50	Depth to saturated zone	0.87
ThB:						
Thackery	Not limited		Not limited		Somewhat limited	
					Slope	0.50
Ud:						
Udorthents	Not Rated		Not Rated		Not Rated	
W:						
Water	Not Rated		Not Rated		Not Rated	
WbA:						
Warsaw	Not limited		Not limited		Not limited	
WnA:						
Westland	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
WyB:						
Wynn	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.43	Restricted permeability	0.43	Slope	0.50
					Restricted permeability	0.43
					Depth to bedrock	0.35
WyB2:						
Wynn	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.43	Restricted permeability	0.43	Depth to bedrock	0.65
					Slope	0.50
					Restricted permeability	0.43
WyC2:						
Wynn	Somewhat limited		Somewhat limited		Very limited	
	Restricted permeability	0.21	Restricted permeability	0.21	Slope	1.00
	Slope	0.16	Slope	0.16	Depth to bedrock	0.95
					Restricted permeability	0.21

TABLE 17.—RECREATION PART 1--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
WyD2:						
Wynn	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.99	Slope	0.99	Slope	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Depth to bedrock	0.65
					Restricted permeability	0.21
XeA:						
Xenia	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.47	Restricted permeability	0.21	Depth to saturated zone	0.47
	Restricted permeability	0.21	Depth to saturated zone	0.21	Restricted permeability	0.21
XeB:						
Xenia	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.47	Restricted permeability	0.21	Slope	0.50
	Restricted permeability	0.21	Depth to saturated zone	0.21	Depth to saturated zone	0.47
					Restricted permeability	0.21
XeB2:						
Xenia	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.47	Restricted permeability	0.21	Slope	0.50
	Restricted permeability	0.21	Depth to saturated zone	0.21	Depth to saturated zone	0.47
					Restricted permeability	0.21
XfB:						
Xenia	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.47	Restricted permeability	0.21	Slope	0.50
	Restricted permeability	0.21	Depth to saturated zone	0.21	Depth to saturated zone	0.47
					Restricted permeability	0.21

TABLE 18.—RECREATION PART 2

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text on page 202 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
CeA:						
Celina	Not limited		Not limited		Somewhat limited	
					Depth to saturated zone	0.03
CeB:						
Celina	Not limited		Not limited		Somewhat limited	
					Depth to saturated zone	0.03
CeB2:						
Celina	Not limited		Not limited		Somewhat limited	
					Depth to saturated zone	0.03
CoA:						
Corwin	Not limited		Not limited		Somewhat limited	
					Depth to saturated zone	0.19
CtA:						
Crosby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Celina	Not limited		Not limited		Somewhat limited	
					Depth to saturated zone	0.03
CtB:						
Crosby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Celina	Not limited		Not limited		Somewhat limited	
					Depth to saturated zone	0.03
CvA:						
Crosby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Lewisburg	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.50	Depth to saturated zone	0.50	Depth to saturated zone	0.78
CyA:						
Cyclone	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
DaA:						
Dana	Not limited		Not limited		Not limited	

TABLE 18.—RECREATION PART 2--Continued

Map symbol and soil name	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
DaB:						
Dana	Not limited		Not limited		Not limited	
EeA:						
Eel	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.08	Depth to saturated zone	0.08	Flooding	0.60
					Depth to saturated zone	0.43
EgA:						
Eldean	Not limited		Not limited		Very limited	
					Carbonate content	1.00
					Gravel content	0.04
					Droughty	0.02
					Content of large stones	0.01
EgB:						
Eldean	Not limited		Not limited		Very limited	
					Carbonate content	1.00
					Gravel content	0.04
					Droughty	0.02
					Content of large stones	0.01
EgB2:						
Eldean	Not limited		Not limited		Very limited	
					Carbonate content	1.00
					Droughty	0.13
					Gravel content	0.04
					Content of large stones	0.01
EhC3:						
Eldean	Not limited		Not limited		Very limited	
					Carbonate content	1.00
					Droughty	0.28
					Slope	0.04
					Gravel content	0.04
					Content of large stones	0.01
EhD3:						
Eldean	Somewhat limited		Not limited		Very limited	
	Slope	0.11			Carbonate content	1.00
					Slope	1.00
					Gravel content	0.04
					Content of large stones	0.01
EkA:						
Eldean	Not limited		Not limited		Very limited	
					Carbonate content	1.00
EkB:						
Eldean	Not limited		Not limited		Very limited	
					Carbonate content	1.00
EkB2:						
Eldean	Not limited		Not limited		Very limited	
					Carbonate content	1.00

TABLE 18.—RECREATION PART 2--Continued

Map symbol and soil name	Paths and trails		Off-road motorcycle trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
FcA:						
Fincastle	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
FdA:						
Fincastle	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
FmA:						
Fox	Not limited		Not limited		Not limited	
FmB:						
Fox	Not limited		Not limited		Not limited	
FmB2:						
Fox	Not limited		Not limited		Not limited	
HeF2:						
Hennepin	Very limited		Somewhat limited		Very limited	
	Slope	1.00	Slope	0.95	Slope	1.00
Miamian	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	1.00	Slope	0.95		
HwE2:						
Hennepin	Somewhat limited		Not limited		Very limited	
	Slope	0.85			Slope	1.00
Wynn	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	0.85			Depth to bedrock	0.46
HwF2:						
Hennepin	Very limited		Somewhat limited		Very limited	
	Slope	1.00	Slope	0.95	Slope	1.00
Wynn	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	1.00	Slope	0.95	Depth to bedrock	0.90
KeC2:						
Kendallville	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Slope	0.04
Eldean	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Carbonate content	1.00
					Slope	0.04
					Droughty	0.04
KeD2:						
Kendallville	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	0.11				
Eldean	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Carbonate content	1.00
	Slope	0.11			Slope	1.00

TABLE 18.—RECREATION PART 2--Continued

Map symbol and soil name	Paths and trails		Off-road motorcycle trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
KnA:						
Kokomo	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
KoA:						
Kokomo	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
LeB:						
Lewisburg	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.50	Depth to saturated zone	0.50	Depth to saturated zone	0.78
Celina	Not limited		Not limited		Somewhat limited	
					Depth to saturated zone	0.03
LfB2:						
Lewisburg	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.50	Depth to saturated zone	0.50	Depth to saturated zone	0.78
Celina	Not limited		Not limited		Somewhat limited	
					Depth to saturated zone	0.03
LgC3:						
Lewisburg	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	0.78
	Depth to saturated zone	0.50	Depth to saturated zone	0.50	Slope	0.04
LpA:						
Lippincott	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Carbonate content	1.00
					Ponding	1.00
MaA:						
Medway	Not limited		Not limited		Somewhat limited	
					Flooding	0.60
MbB2:						
Miami	Not limited		Not limited		Not limited	
McE2:						
Miami	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	0.89				
Kendallville	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	0.89				

TABLE 18.—RECREATION PART 2--Continued

Map symbol and soil name	Paths and trails		Off-road motorcycle trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
McF2:						
Miami	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	1.00	Slope	0.93		
Kendallville	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	1.00	Slope	0.93		
MdC2:						
Miami	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Slope	0.04
MdD2:						
Miami	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	0.11				
MeC:						
Miamian	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Slope	0.04
MeC2:						
Miamian	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Slope	0.04
MeD2:						
Miamian	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	0.11				
MfB:						
Miamian	Not limited		Not limited		Not limited	
Celina	Not limited		Not limited		Somewhat limited	
					Depth to saturated zone	0.03
MfB2:						
Miamian	Not limited		Not limited		Not limited	
Celina	Not limited		Not limited		Somewhat limited	
					Depth to saturated zone	0.03
MgE2:						
Miamian	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	0.89				
Kendallville	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	0.89				
MgF2:						
Miamian	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	1.00	Slope	0.93		
Kendallville	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	1.00	Slope	0.93		

TABLE 18.—RECREATION PART 2--Continued

Map symbol and soil name	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
MhC3:						
Miamian	Not limited		Not limited		Somewhat limited	
					Slope	0.04
Losantville	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
					Droughty	0.49
					Slope	0.04
MhD3:						
Miamian	Somewhat limited		Not limited		Very limited	
	Slope	0.11			Slope	1.00
Losantville	Somewhat limited		Somewhat limited		Very limited	
	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Slope	1.00
	Slope	0.11			Droughty	0.80
					Depth to saturated zone	0.75
MmE2:						
Miamian	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	0.89				
Hennepin	Somewhat limited		Not limited		Very limited	
	Slope	0.89			Slope	1.00
MnE3:						
Miamian	Somewhat limited		Not limited		Very limited	
	Slope	0.89			Slope	1.00
Hennepin	Somewhat limited		Not limited		Very limited	
	Slope	0.89			Slope	1.00
MpA:						
Milford	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
MrA:						
Milford	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
MsA:						
Millsdale	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
					Depth to bedrock	0.84
MtA:						
Millsdale	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
					Depth to bedrock	0.46

TABLE 18.—RECREATION PART 2--Continued

Map symbol and soil name	Paths and trails		Off-road motorcycle trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MuA:						
Milton	Not limited		Not limited		Somewhat limited	
					Depth to bedrock	0.35
MuB:						
Milton	Not limited		Not limited		Somewhat limited	
					Depth to bedrock	0.65
MuB2:						
Milton	Not limited		Not limited		Somewhat limited	
					Depth to bedrock	0.65
MuC2:						
Milton	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Depth to bedrock	0.65
					Slope	0.04
MuD2:						
Milton	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	0.11			Depth to bedrock	0.54
MuE2:						
Milton	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	0.85			Depth to bedrock	0.95
					Droughty	0.08
MwA:						
Morningsun	Not limited		Not limited		Not limited	
MxA:						
Morningsun	Not limited		Not limited		Not limited	
Xenia	Not limited		Not limited		Somewhat limited	
					Depth to saturated zone	0.19
MxB:						
Morningsun	Not limited		Not limited		Not limited	
Xenia	Not limited		Not limited		Somewhat limited	
					Depth to saturated zone	0.19
MxB2:						
Morningsun	Not limited		Not limited		Not limited	
Xenia	Not limited		Not limited		Somewhat limited	
					Depth to saturated zone	0.19
MyA:						
Mahalasville	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
OcA:						
Ockley	Not limited		Not limited		Not limited	

TABLE 18.—RECREATION PART 2--Continued

Map symbol and soil name	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
OcB:						
Ockley	Not limited		Not limited		Not limited	
Pg:						
Pits, Gravel	Not Rated		Not Rated		Not Rated	
Pq:						
Pits, Quarry	Not Rated		Not Rated		Not Rated	
PtB:						
Plattville	Not limited		Not limited		Not limited	
RaA:						
Rainsville	Not limited		Not limited		Not limited	
RaB:						
Rainsville	Not limited		Not limited		Not limited	
RaB2:						
Rainsville	Not limited		Not limited		Not limited	
RcA:						
Randolph	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
					Depth to bedrock	0.20
RcB:						
Randolph	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
					Depth to bedrock	0.29
RnE2:						
Rodman	Somewhat limited		Not limited		Very limited	
	Slope	0.85			Slope	1.00
					Droughty	0.99
					Gravel content	0.07
RnF2:						
Rodman	Very limited		Somewhat limited		Very limited	
	Slope	1.00	Slope	0.93	Slope	1.00
					Droughty	0.99
					Gravel content	0.07
RoE2:						
Rodman	Somewhat limited		Not limited		Very limited	
	Slope	0.85			Slope	1.00
					Droughty	0.99
					Gravel content	0.07
Kendallville	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	0.85				

TABLE 18.—RECREATION PART 2--Continued

Map symbol and soil name	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
RoF2:						
Rodman	Very limited		Somewhat limited		Very limited	
	Slope	1.00	Slope	0.93	Slope	1.00
					Droughty	0.99
					Gravel content	0.07
Kendallville	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	1.00	Slope	0.93		
RpA:						
Rossburg	Not limited		Not limited		Somewhat limited	
					Flooding	0.60
RuB:						
Russell	Not limited		Not limited		Not limited	
Miamian	Not limited		Not limited		Not limited	
RuB2:						
Russell	Not limited		Not limited		Not limited	
Miamian	Not limited		Not limited		Not limited	
SeA:						
Savona	Somewhat limited		Somewhat limited		Very limited	
	Depth to saturated zone	0.50	Depth to saturated zone	0.50	Carbonate content	1.00
					Depth to saturated zone	0.78
SnA:						
Sloan	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
	Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
	Flooding	0.40	Flooding	0.40	Ponding	1.00
StA:						
Stonelick	Somewhat limited		Somewhat limited		Very limited	
	Flooding	0.40	Flooding	0.40	Flooding	1.00
SvA:						
Sugarvalley	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.50	Depth to saturated zone	0.50	Depth to saturated zone	0.78
SwA:						
Sugarvalley	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.50	Depth to saturated zone	0.50	Depth to saturated zone	0.78
Fincastle	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
ThA:						
Thackery	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.11	Depth to saturated zone	0.11	Depth to saturated zone	0.48

TABLE 18.—RECREATION PART 2--Continued

Map symbol and soil name	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
ThB:						
Thackery	Not limited		Not limited		Not limited	
Ud:						
Udorthents	Not Rated		Not Rated		Not Rated	
W:						
Water	Not Rated		Not Rated		Not Rated	
WbA:						
Warsaw	Not limited		Not limited		Not limited	
WnA:						
Westland	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
WyB:						
Wynn	Not limited		Not limited		Somewhat limited	
					Depth to bedrock	0.35
WyB2:						
Wynn	Not limited		Not limited		Somewhat limited	
					Depth to bedrock	0.65
WyC2:						
Wynn	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Depth to bedrock	0.95
					Slope	0.04
WyD2:						
Wynn	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	0.11			Depth to bedrock	0.65
XeA:						
Xenia	Not limited		Not limited		Somewhat limited	
					Depth to saturated zone	0.19
XeB:						
Xenia	Not limited		Not limited		Somewhat limited	
					Depth to saturated zone	0.19
XeB2:						
Xenia	Not limited		Not limited		Somewhat limited	
					Depth to saturated zone	0.19
XfB:						
Xenia	Not limited		Not limited		Somewhat limited	
					Depth to saturated zone	0.19

TABLE 19.--WILDLIFE HABITAT

(See text on page 204 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
CeA:										
Celina	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
CeB:										
Celina	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
CeB2:										
Celina	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
CoA:										
Corwin	Good	Good	Good	Good	Good	Poor	Fair	Good	Good	Poor.
CtA:										
Crosby	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Celina	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
CtB:										
Crosby	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Celina	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
CvA:										
Crosby	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Lewisburg	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
CyA:										
Cyclone	Fair	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
DaA:										
Dana	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
DaB:										
Dana	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
EeA:										
Eel	Good	Good	Fair	Good	Good	Poor	Poor	Good	Good	Poor.
EgA:										
Eldean	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
EgB:										
Eldean	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
EgB2:										
Eldean	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
EhC3:										
Eldean	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
EhD3:										
Eldean	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

Table 19.--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
EkA:										
Eldean	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
EkB:										
Eldean	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
EkB2:										
Eldean	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
FcA:										
Fincastle	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
FdA:										
Fincastle	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
FmA:										
Fox	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
FmB:										
Fox	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
FmB2:										
Fox	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
HeF2:										
Hennepin	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Miamian	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
HwE2:										
Hennepin	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Wynn	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
HwF2:										
Hennepin	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Wynn	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
KeC2:										
Kendallville	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Eldean	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
KeD2:										
Kendallville	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Eldean	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.

Table 19.--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
KnA:										
Kokomo	Fair	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
KoA:										
Kokomo	Fair	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
LeB:										
Lewisburg	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Celina	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
LfB2:										
Lewisburg	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Celina	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
LgC3:										
Lewisburg	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
LpA:										
Lippincott	Poor	Fair	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
MaA:										
Medway	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
MbB2:										
Miami	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
McE2:										
Miami	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Kendallville	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
McF2:										
Miami	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Kendallville	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
MdC2:										
Miami	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
MdD2:										
Miami	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
MeC:										
Miamian	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MeC2:										
Miamian	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

Table 19.--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
MeD2:										
Miamian	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MfB:										
Miamian	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Celina	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
MfB2:										
Miamian	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Celina	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
MgE2:										
Miamian	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Kendallville	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
MgF2:										
Miamian	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Kendallville	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
MhC3:										
Miamian	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Losantville	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MhD3:										
Miamian	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Losantville	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MmE2:										
Miamian	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Hennepin	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
MnE3:										
Miamian	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Hennepin	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
MpA:										
Milford	Good	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
MrA:										
Milford	Good	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.

Table 19.--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
MsA:										
Millsdale	Fair	Fair	Fair	Fair	Poor	Good	Fair	Fair	Fair	Fair.
MtA:										
Millsdale	Fair	Fair	Fair	Fair	Poor	Good	Fair	Fair	Fair	Fair.
MuA:										
Milton	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MuB:										
Milton	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MuB2:										
Milton	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MuC2:										
Milton	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
MuD2:										
Milton	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
MuE2:										
Milton	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
MwA:										
Morningsun	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
MxA:										
Morningsun	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Xenia	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
MxB:										
Morningsun	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Xenia	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
MxB2:										
Morningsun	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Xenia	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
MyA:										
Mahalasville	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
OcA:										
Ockley	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
OcB:										
Ockley	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Pg:										
Pits, gravel	---	---	---	---	---	---	---	---	---	---
Pq:										
Pits, quarry	---	---	---	---	---	---	---	---	---	---

Table 19.--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
PtB:										
Plattville	Good	Good	Good	Good	Good	Poor	Fair	Good	Good	Poor.
RaA:										
Rainsville	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
RaB:										
Rainsville	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
RaB2:										
Rainsville	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
RcA:										
Randolph	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
RcB:										
Randolph	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
RnE2:										
Rodman	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
RnF2:										
Rodman	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
RoE2:										
Rodman	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Kendallville	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
RoF2:										
Rodman	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Kendallville	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
RpA:										
Rossburg	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
RuB:										
Russell	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Miamian	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
RuB2:										
Russell	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Miamian	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
SeA:										
Savona	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.

Table 19.--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
SnA:										
Sloan	Fair	Fair	Fair	Poor	Poor	Good	Good	Fair	Poor	Good.
StA:										
Stonelick	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
SvA:										
Sugarvalley	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
SwA:										
Sugarvalley	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Fincastle	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
ThA:										
Thackery	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
ThB:										
Thackery	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Ud:										
Udorthents	---	---	---	---	---	---	---	---	---	---
W:										
Water	---	---	---	---	---	---	---	---	---	---
WbA:										
Warsaw	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
WnA:										
Westland	Fair	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
WyB:										
Wynn	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
WyB2:										
Wynn	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
WyC2:										
Wynn	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
WyD2:										
Wynn	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
XeA:										
Xenia	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
XeB:										
Xenia	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
XeB2:										
Xenia	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
XfB:										
Xenia	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.

TABLE 20.--CONSTRUCTION MATERIALS PART 1

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 1.00. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text on page 206 for further explanation of ratings in this table.)

Map symbol and soil name	Potential source of gravel		Potential source of sand	
	Rating class	Value	Rating class	Value
CeA:				
Celina	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
CeB:				
Celina	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
CeB2:				
Celina	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
CoA:				
Corwin	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
CtA:				
Crosby	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Celina	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
CtB:				
Crosby	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Celina	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
CvA:				
Crosby	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Lewisburg	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
CyA:				
Cyclone	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
DaA:				
Dana	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00

Table 20.—Construction Materials Part 1--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand	
	Rating class	Value	Rating class	Value
DaB:				
Dana	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
EeA:				
Eel	Good		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	1.00	Bottom layer	0.35
EgA:				
Eldean	Good		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	1.00	Bottom layer	0.35
EgB:				
Eldean	Good		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	1.00	Bottom layer	0.35
EgB2:				
Eldean	Good		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	1.00	Bottom layer	0.35
EhC3:				
Eldean	Good		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	1.00	Bottom layer	0.35
EhD3:				
Eldean	Good		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	1.00	Bottom layer	0.35
EkA:				
Eldean	Good		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	1.00	Bottom layer	0.35
EkB:				
Eldean	Good		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	1.00	Bottom layer	0.35
EkB2:				
Eldean	Good		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	1.00	Bottom layer	0.35
FcA:				
Fincastle	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
FdA:				
Fincastle	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
FmA:				
Fox	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00

Table 20.—Construction Materials Part 1--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand	
	Rating class	Value	Rating class	Value
FmB:				
Fox	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
FmB2:				
Fox	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
HeF2:				
Hennepin	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Miamian	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
HwE2:				
Hennepin	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Wynn	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
HwF2:				
Hennepin	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Wynn	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
KeC2:				
Kendallville	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Eldean	Good		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	1.00	Bottom layer	0.35
KeD2:				
Kendallville	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Eldean	Good		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	1.00	Bottom layer	0.35
KnA:				
Kokomo	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
KoA:				
Kokomo	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00

Table 20.—Construction Materials Part 1--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand	
	Rating class	Value	Rating class	Value
LeB:				
Lewisburg	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Celina	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
LfB2:				
Lewisburg	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Celina	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
LgC3:				
Lewisburg	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
LpA:				
Lippincott	Good		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	1.00	Bottom layer	0.39
MaA:				
Medway	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
MbB2:				
Miami	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
McE2:				
Miami	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Kendallville	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
McF2:				
Miami	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Kendallville	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
MdC2:				
Miami	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
MdD2:				
Miami	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00

Table 20.—Construction Materials Part 1--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand	
	Rating class	Value	Rating class	Value
MeC:				
Miamian	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
MeC2:				
Miamian	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
MeD2:				
Miamian	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
MfB:				
Miamian	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Celina	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
MfB2:				
Miamian	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Celina	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
MgE2:				
Miamian	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Kendallville	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
MgF2:				
Miamian	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Kendallville	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
MhC3:				
Miamian	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Losantville	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
MhD3:				
Miamian	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00

Table 20.—Construction Materials Part 1--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand	
	Rating class	Value	Rating class	Value
Losantville	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
MmE2:				
Miamian	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Hennepin	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
MnE3:				
Miamian	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Hennepin	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
MpA:				
Milford	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
MrA:				
Milford	Good		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	1.00	Bottom layer	0.89
MsA:				
Millsdale	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
MtA:				
Millsdale	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
MuA:				
Milton	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
MuB:				
Milton	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
MuB2:				
Milton	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
MuC2:				
Milton	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00

Table 20.—Construction Materials Part 1--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand	
	Rating class	Value	Rating class	Value
MuD2:				
Milton	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
MuE2:				
Milton	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
MwA:				
Morningsun	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
MxA:				
Morningsun	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Xenia	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
MxB:				
Morningsun	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Xenia	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
MxB2:				
Morningsun	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Xenia	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
MyA:				
Mahalasville	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
OcA:				
Ockley	Good		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	1.00	Bottom layer	0.91
OcB:				
Ockley	Good		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	1.00	Bottom layer	0.91
Pg:				
Pits, Gravel	Not rated		Not rated	
Pq:				
Pits, Quarry	Not rated		Not rated	

Table 20.—Construction Materials Part 1--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand	
	Rating class	Value	Rating class	Value
PtB:				
Plattville	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
RaA:				
Rainsville	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
RaB:				
Rainsville	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
RaB2:				
Rainsville	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
RcA:				
Randolph	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
RcB:				
Randolph	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
RnE2:				
Rodman	Good		Fair	
	Thickest layer	0.91	Thickest layer	0.50
	Bottom layer	1.00	Bottom layer	0.91
RnF2:				
Rodman	Good		Fair	
	Thickest layer	0.91	Thickest layer	0.50
	Bottom layer	1.00	Bottom layer	0.91
RoE2:				
Rodman	Good		Fair	
	Thickest layer	0.91	Thickest layer	0.50
	Bottom layer	1.00	Bottom layer	0.91
Kendallville	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
RoF2:				
Rodman	Good		Fair	
	Thickest layer	0.91	Thickest layer	0.50
	Bottom layer	1.00	Bottom layer	0.91
Kendallville	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
RpA:				
Rossburg	Good		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	1.00	Bottom layer	0.50

Table 20.—Construction Materials Part 1--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand	
	Rating class	Value	Rating class	Value
RuB:				
Russell	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Miamian	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
RuB2:				
Russell	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Miamian	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
SeA:				
Savona	Good		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	1.00	Bottom layer	0.50
SnA:				
Sloan	Good		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	1.00	Bottom layer	0.50
StA:				
Stonelick	Good		Fair	
	Thickest layer	0.91	Thickest layer	0.50
	Bottom layer	1.00	Bottom layer	0.91
SvA:				
Sugarvalley	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
SwA:				
Sugarvalley	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Fincastle	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
ThA:				
Thackery	Good		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	1.00	Bottom layer	0.41
ThB:				
Thackery	Good		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	1.00	Bottom layer	0.41
Ud:				
Udorthents	Not rated		Not rated	
W:				
Water	Not rated		Not rated	

Table 20.—Construction Materials Part 1--Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand	
	Rating class	Value	Rating class	Value
WbA:				
Warsaw	Good		Fair	
	Thickest layer	0.91	Thickest layer	0.50
	Bottom layer	1.00	Bottom layer	0.91
WnA:				
Westland	Good		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	1.00	Bottom layer	0.87
WyB:				
Wynn	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
WyB2:				
Wynn	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
WyC2:				
Wynn	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
WyD2:				
Wynn	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
XeA:				
Xenia	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
XeB:				
Xenia	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
XeB2:				
Xenia	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
XfB:				
Xenia	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00

TABLE 21.--CONSTRUCTION MATERIALS PART 2

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text on page 206 for further explanation of ratings in this table.)

Map symbol and soil name	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CeA:						
Celina	Poor		Fair		Fair	
	Low content of organic matter	0.00	Low strength	0.22	Too clayey	0.35
	Carbonate content	0.08	Depth to saturated zone	0.76	Depth to saturated zone	0.76
	Too clayey	0.59			Hard to reclaim (dense layer)	0.94
	Water erosion	0.99				
CeB:						
Celina	Poor		Fair		Fair	
	Low content of organic matter	0.00	Low strength	0.22	Too clayey	0.35
	Carbonate content	0.08	Depth to saturated zone	0.76	Depth to saturated zone	0.76
	Too clayey	0.59			Hard to reclaim (dense layer)	0.99
	Water erosion	0.99				
CeB2:						
Celina	Poor		Fair		Fair	
	Low content of organic matter	0.00	Low strength	0.22	Too clayey	0.35
	Carbonate content	0.08	Depth to saturated zone	0.76	Hard to reclaim (dense layer)	0.35
	Too clayey	0.59			Depth to saturated zone	0.76
	Water erosion	0.99				
CoA:						
Corwin	Poor		Fair		Fair	
	Low content of organic matter	0.00	Depth to saturated zone	0.53	Depth to saturated zone	0.53
	Carbonate content	0.68			Hard to reclaim (dense layer)	0.99
	Water erosion	0.99				
CtA:						
Crosby	Poor		Poor		Poor	
	Low content of organic matter	0.00	Depth to saturated zone	0.00	Too clayey	0.00
	Too clayey	0.00			Depth to saturated zone	0.00
	Carbonate content	0.08			Not hard to reclaim (dense layer)	0.99
	Water erosion	0.90				
Celina	Poor		Fair		Fair	
	Low content of organic matter	0.00	Low strength	0.22	Too clayey	0.35
	Carbonate content	0.08	Depth to saturated zone	0.76	Depth to saturated zone	0.76
	Too clayey	0.59			Hard to reclaim (dense layer)	0.84
	Water erosion	0.99				

Table 21.—Construction Materials Part 2--Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
CtB:						
Crosby	Poor		Poor		Poor	
	Low content of organic matter	0.00	Depth to saturated zone	0.00	Too clayey	0.00
	Too clayey	0.00			Depth to saturated zone	0.00
	Carbonate content	0.08			Hard to reclaim (dense layer)	0.71
	Water erosion	0.90				
	Droughty	0.99				
Celina	Poor		Fair		Fair	
	Low content of organic matter	0.00	Low strength	0.22	Too clayey	0.35
	Carbonate content	0.08	Depth to saturated zone	0.76	Depth to saturated zone	0.76
	Too clayey	0.59			Not hard to reclaim (dense layer)	0.99
	Water erosion	0.99				
CvA:						
Crosby	Poor		Poor		Poor	
	Low content of organic matter	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Too clayey	0.08			Too clayey	0.06
	Carbonate content	0.08			Hard to reclaim (dense layer)	0.94
	Water erosion	0.90				
Lewisburg	Poor		Fair		Poor	
	Low content of organic matter	0.00	Depth to saturated zone	0.12	Hard to reclaim (dense layer)	0.00
	Carbonate content	0.08	Low strength	0.78	Carbonate content	0.08
	Water erosion	0.90			Depth to saturated zone	0.12
					Rock fragments	0.97
CyA:						
Cyclone	Fair		Poor		Poor	
	Carbonate content	0.46	Depth to saturated zone	0.00	Depth to saturated zone	0.00
			Low strength	0.00		
			Shrink-swell	0.89		
DaA:						
Dana	Fair		Poor		Fair	
	Low content of organic matter	0.88	Low strength	0.00	Depth to saturated zone	0.98
	Water erosion	0.90	Shrink-swell	0.92	Hard to reclaim (dense layer)	0.99
	Carbonate content	0.92	Depth to saturated zone	0.98		
DaB:						
Dana	Fair		Fair		Fair	
	Low content of organic matter	0.88	Shrink-swell	0.96	Hard to reclaim (dense layer)	0.97
	Water erosion	0.90	Depth to saturated zone	0.98	Depth to saturated zone	0.98
	Carbonate content	0.92				

Table 21.—Construction Materials Part 2--Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
EeA:						
Eel	Fair		Fair		Poor	
	Water erosion	0.90	Depth to saturated zone	0.32	Hard to reclaim, rock fragments	0.00
	Carbonate content	0.92			Depth to saturated zone	0.32
EgA:						
Eldean	Poor		Good		Poor	
	Carbonate content	0.00			Hard to reclaim, rock fragments	0.00
	Too clayey	0.08			Rock fragments	0.00
	Low content of organic matter	0.08			Too clayey	0.06
	Droughty	0.82				
	Water erosion	0.99				
EgB:						
Eldean	Poor		Good		Poor	
	Carbonate content	0.00			Hard to reclaim, rock fragments	0.00
	Too clayey	0.08			Rock fragments	0.00
	Low content of organic matter	0.08			Too clayey	0.06
	Droughty	0.82				
	Water erosion	0.99				
EgB2:						
Eldean	Poor		Good		Poor	
	Carbonate content	0.00			Hard to reclaim, rock fragments	0.00
	Too clayey	0.08			Rock fragments	0.00
	Low content of organic matter	0.08			Too clayey	0.06
	Droughty	0.67				
	Water erosion	0.99				
EhC3:						
Eldean	Poor		Good		Poor	
	Carbonate content	0.00			Carbonate content	0.00
	Low content of organic matter	0.08			Hard to reclaim, rock fragments	0.00
	Droughty	0.53			Rock fragments	0.00
	Too sandy	0.78			Too sandy	0.78
	Water erosion	0.99			Slope	0.96
EhD3:						
Eldean	Poor		Good		Poor	
	Carbonate content	0.00			Hard to reclaim, rock fragments	0.00
	Too clayey	0.00			Slope	0.00
	Low content of organic matter	0.08			Rock fragments	0.00
	Droughty	0.96			Too clayey	0.00
	Water erosion	0.99				
EkA:						
Eldean	Poor		Good		Poor	
	Carbonate content	0.00			Hard to reclaim, rock fragments	0.00
	Too clayey	0.00			Too clayey	0.00
	Low content of organic matter	0.88			Rock fragments	0.00
	Water erosion	0.99				

Table 21.—Construction Materials Part 2--Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
EkB:						
Eldean	Poor		Good		Poor	
	Carbonate content	0.00			Hard to reclaim, rock fragments	0.00
	Too clayey	0.00			Too clayey	0.00
	Low content of organic matter	0.88			Rock fragments	0.50
	Water erosion	0.99				
	Droughty	0.99				
EkB2:						
Eldean	Poor		Good		Poor	
	Carbonate content	0.00			Hard to reclaim, rock fragments	0.00
	Too clayey	0.00			Too clayey	0.00
	Low content of organic matter	0.88			Rock fragments	0.00
	Droughty	0.94				
	Water erosion	0.99				
FcA:						
Fincastle	Fair		Poor		Poor	
	Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Carbonate content	0.68	Shrink-swell	0.97	Hard to reclaim (dense layer)	0.90
	Water erosion	0.99				
FdA:						
Fincastle	Fair		Poor		Poor	
	Low content of organic matter	0.12	Low strength	0.00	Depth to saturated zone	0.00
	Carbonate content	0.68	Depth to saturated zone	0.00	Hard to reclaim (dense layer)	0.94
	Water erosion	0.99	Shrink-swell	0.98		
FmA:						
Fox	Fair		Fair		Fair	
	Low content of organic matter	0.12			Hard to reclaim, rock fragments	0.18
	Carbonate content	0.68			Rock fragments	0.50
	Water erosion	0.99			Carbonate content	0.80
FmB:						
Fox	Fair		Fair		Fair	
	Low content of organic matter	0.12			Hard to reclaim, rock fragments	0.18
	Carbonate content	0.68			Rock fragments	0.50
	Water erosion	0.99			Carbonate content	0.80
FmB2:						
Fox	Fair		Fair		Fair	
	Low content of organic matter	0.12			Hard to reclaim, rock fragments	0.18
	Carbonate content	0.68			Rock fragments	0.50
	Water erosion	0.99			Carbonate content	0.80
HeF2:						
Hennepin	Fair		Poor		Poor	
	Low content of organic matter	0.01	Slope	0.00	Hard to reclaim (dense layer)	0.00
	Carbonate content	0.08			Slope	0.00
					Carbonate content	0.08

Table 21.—Construction Materials Part 2--Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
Miamian	Fair		Poor		Poor	
	Carbonate content	0.01	Slope	0.00	Slope	0.00
	Low content of organic matter	0.18	Low strength	0.78	Hard to reclaim (dense layer)	0.46
	Water erosion	0.99				
HwE2:						
Hennepin	Fair		Fair		Poor	
	Low content of organic matter	0.01	Slope	0.24	Slope	0.00
	Carbonate content	0.08			Hard to reclaim (dense layer)	0.00
					Carbonate content	0.08
Wynn	Fair		Poor		Poor	
	Low content of organic matter	0.12	Depth to bedrock	0.00	Slope	0.00
	Too clayey	0.50	Low strength	0.00	Too clayey	0.29
	Depth to bedrock	0.54	Slope	0.24	Depth to bedrock	0.54
	Droughty	0.98	Shrink-swell	0.87		
	Water erosion	0.99				
HwF2:						
Hennepin	Fair		Poor		Poor	
	Low content of organic matter	0.01	Slope	0.00	Slope	0.00
	Carbonate content	0.08			Hard to reclaim (dense layer)	0.00
					Carbonate content	0.08
Wynn	Fair		Poor		Poor	
	Depth to bedrock	0.10	Depth to bedrock	0.00	Slope	0.00
	Low content of organic matter	0.12	Slope	0.00	Depth to bedrock	0.10
	Too clayey	0.50	Low strength	0.00	Too clayey	0.29
	Droughty	0.56	Shrink-swell	0.87		
	Water erosion	0.99				
KeC2:						
Kendallville	Fair		Fair		Fair	
	Low content of organic matter	0.08	Low strength	0.78	Rock fragments	0.28
	Carbonate content	0.16			Hard to reclaim (dense layer)	0.54
	Water erosion	0.99			Too clayey	0.59
	Too clayey	0.99			Slope	0.96
Eldean	Poor		Good		Poor	
	Carbonate content	0.00			Hard to reclaim, rock fragments	0.00
	Too clayey	0.08			Too clayey	0.06
	Droughty	0.79			Carbonate content	0.32
	Low content of organic matter	0.88			Rock fragments	0.50
	Water erosion	0.99			Slope	0.96
KeD2:						
Kendallville	Fair		Fair		Poor	
	Low content of organic matter	0.08	Low strength	0.78	Slope	0.00
	Carbonate content	0.16			Rock fragments	0.28
	Water erosion	0.99			Too clayey	0.59
	Too clayey	0.99			Hard to reclaim (dense layer)	0.71

Table 21.—Construction Materials Part 2--Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
Eldean	Poor		Good		Poor	
	Carbonate content	0.00			Hard to reclaim, rock fragments	0.00
	Too clayey	0.08			Slope	0.00
	Low content of organic matter	0.88			Too clayey	0.06
	Droughty	0.94			Carbonate content	0.32
	Water erosion	0.99			Rock fragments	0.50
KnA:						
Kokomo	Fair		Poor		Poor	
	Too clayey	0.32	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Carbonate content	0.68	Low strength	0.00	Too clayey	0.28
			Shrink-swell	0.87		
KoA:						
Kokomo	Fair		Poor		Poor	
	Too clayey	0.32	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Carbonate content	0.68	Low strength	0.00	Too clayey	0.28
			Shrink-swell	0.87		
LeB:						
Lewisburg	Poor		Poor		Poor	
	Low content of organic matter	0.00	Low strength	0.00	Hard to reclaim (dense layer)	0.00
	Carbonate content	0.08	Depth to saturated zone	0.12	Carbonate content	0.08
	Water erosion	0.90			Depth to saturated zone	0.12
					Rock fragments	0.97
Celina	Fair		Fair		Fair	
	Carbonate content	0.08	Low strength	0.22	Too clayey	0.43
	Low content of organic matter	0.32	Depth to saturated zone	0.76	Depth to saturated zone	0.76
	Too clayey	0.59			Hard to reclaim (dense layer)	0.84
	Water erosion	0.99				
LfB2:						
Lewisburg	Poor		Poor		Poor	
	Low content of organic matter	0.00	Low strength	0.00	Hard to reclaim (dense layer)	0.00
	Carbonate content	0.08	Depth to saturated zone	0.12	Carbonate content	0.08
	Water erosion	0.90			Depth to saturated zone	0.12
					Rock fragments	0.97
Celina	Fair		Fair		Fair	
	Carbonate content	0.08	Low strength	0.22	Too clayey	0.43
	Low content of organic matter	0.32	Depth to saturated zone	0.76	Hard to reclaim (dense layer)	0.54
	Too clayey	0.59			Depth to saturated zone	0.76
	Water erosion	0.99				

Table 21.—Construction Materials Part 2--Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
LgC3:						
Lewisburg	Poor		Poor		Poor	
	Low content of organic matter	0.00	Low strength	0.00	Hard to reclaim (dense layer)	0.00
	Carbonate content	0.08	Depth to saturated zone	0.12	Carbonate content	0.08
	Water erosion	0.90			Depth to saturated zone	0.12
					Slope	0.96
					Rock fragments	0.97
LpA:						
Lippincott	Poor		Poor		Poor	
	Carbonate content	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.00			Hard to reclaim, rock fragments	0.00
	Too clayey	0.32			Too clayey	0.32
MaA:						
Medway	Fair		Fair		Fair	
	Low content of organic matter	0.32	Depth to saturated zone	0.98	Rock fragments	0.97
					Depth to saturated zone	0.98
MbB2:						
Miami	Fair		Fair		Fair	
	Low content of organic matter	0.12	Depth to saturated zone	0.98	Hard to reclaim (dense layer)	0.54
	Carbonate content	0.16			Too clayey	0.57
	Droughty	0.95			Depth to saturated zone	0.98
	Too clayey	0.98				
	Water erosion	0.99				
McE2:						
Miami	Fair		Fair		Poor	
	Low content of organic matter	0.12	Slope	0.18	Slope	0.00
	Carbonate content	0.16	Depth to saturated zone	0.98	Too clayey	0.57
	Droughty	0.97			Hard to reclaim (dense layer)	0.65
	Too clayey	0.98			Depth to saturated zone	0.98
	Water erosion	0.99				
Kendallville	Fair		Fair		Poor	
	Low content of organic matter	0.08	Slope	0.18	Slope	0.00
	Carbonate content	0.16	Low strength	0.78	Rock fragments	0.28
	Water erosion	0.99			Hard to reclaim (dense layer)	0.65

Table 21.—Construction Materials Part 2--Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
McF2:						
Miami	Fair		Poor		Poor	
	Low content of organic matter	0.12	Slope	0.00	Slope	0.00
	Carbonate content	0.16	Depth to saturated zone	0.98	Hard to reclaim (dense layer)	0.03
	Water erosion	0.68			Too clayey	0.57
	Droughty	0.94			Depth to saturated zone	0.98
	Too clayey	0.98				
Kendallville	Fair		Poor		Poor	
	Carbonate content	0.16	Slope	0.00	Slope	0.00
	Low content of organic matter	0.18	Low strength	0.78	Rock fragments	0.72
	Water erosion	0.99	Shrink-swell	0.99		
MdC2:						
Miami	Fair		Fair		Fair	
	Low content of organic matter	0.12	Depth to saturated zone	0.98	Hard to reclaim (dense layer)	0.20
	Carbonate content	0.16			Too clayey	0.57
	Droughty	0.82			Slope	0.96
	Too clayey	0.98			Depth to saturated zone	0.98
	Water erosion	0.99				
MdD2:						
Miami	Fair		Fair		Poor	
	Low content of organic matter	0.12	Depth to saturated zone	0.98	Slope	0.00
	Carbonate content	0.16			Hard to reclaim (dense layer)	0.54
	Droughty	0.96			Too clayey	0.57
	Too clayey	0.98			Depth to saturated zone	0.98
	Water erosion	0.99				
MeC:						
Miamian	Fair		Fair		Fair	
	Carbonate content	0.01	Low strength	0.78	Carbonate content	0.01
	Low content of organic matter	0.18			Hard to reclaim (dense layer)	0.10
	Water erosion	0.99			Rock fragments	0.72
					Slope	0.96
MeC2:						
Miamian	Fair		Fair		Fair	
	Carbonate content	0.01	Low strength	0.78	Too clayey	0.03
	Too clayey	0.05			Hard to reclaim (dense layer)	0.46
	Low content of organic matter	0.18			Slope	0.96
	Water erosion	0.99				
MeD2:						
Miamian	Fair		Fair		Poor	
	Carbonate content	0.01	Low strength	0.78	Slope	0.00
	Too clayey	0.05			Too clayey	0.03
	Low content of organic matter	0.18			Hard to reclaim (dense layer)	0.29
	Water erosion	0.99				

Table 21.—Construction Materials Part 2--Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
MfB:						
Miamian	Fair		Fair		Fair	
	Carbonate content	0.01	Low strength	0.78	Too clayey	0.23
	Low content of organic matter	0.18			Hard to reclaim (dense layer)	0.90
	Too clayey	0.32				
	Water erosion	0.99				
Celina	Fair		Fair		Fair	
	Carbonate content	0.08	Low strength	0.22	Too clayey	0.43
	Low content of organic matter	0.32	Depth to saturated zone	0.76	Depth to saturated zone	0.76
	Too clayey	0.59			Hard to reclaim (dense layer)	0.84
	Water erosion	0.99				
MfB2:						
Miamian	Fair		Fair		Fair	
	Carbonate content	0.01	Low strength	0.78	Too clayey	0.23
	Low content of organic matter	0.18			Hard to reclaim (dense layer)	0.94
	Too clayey	0.32				
	Water erosion	0.99				
Celina	Fair		Fair		Fair	
	Carbonate content	0.08	Low strength	0.22	Too clayey	0.43
	Low content of organic matter	0.32	Depth to saturated zone	0.76	Depth to saturated zone	0.76
	Too clayey	0.59			Hard to reclaim (dense layer)	0.80
	Water erosion	0.99				
MgE2:						
Miamian	Fair		Fair		Poor	
	Carbonate content	0.01	Slope	0.18	Slope	0.00
	Too clayey	0.05	Low strength	0.78	Too clayey	0.03
	Low content of organic matter	0.18			Hard to reclaim (dense layer)	0.99
	Water erosion	0.99				
Kendallville	Fair		Fair		Poor	
	Low content of organic matter	0.08	Slope	0.18	Slope	0.00
	Carbonate content	0.16	Low strength	0.78	Rock fragments	0.28
	Water erosion	0.99			Hard to reclaim (dense layer)	0.46
MgF2:						
Miamian	Fair		Poor		Poor	
	Carbonate content	0.01	Slope	0.00	Slope	0.00
	Too clayey	0.05	Low strength	0.78	Too clayey	0.03
	Low content of organic matter	0.18			Hard to reclaim (dense layer)	0.35
	Water erosion	0.99				
Kendallville	Fair		Poor		Poor	
	Low content of organic matter	0.08	Slope	0.00	Slope	0.00
	Carbonate content	0.16	Low strength	0.78	Rock fragments	0.28
	Water erosion	0.99			Hard to reclaim (dense layer)	0.90

Table 21.—Construction Materials Part 2--Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
MhC3:						
Miamian	Fair		Fair		Fair	
	Carbonate content	0.01	Low strength	0.78	Hard to reclaim (dense layer)	0.20
	Low content of organic matter	0.18			Slope	0.96
	Water erosion	0.99				
Losantville	Fair		Fair		Poor	
	Carbonate content	0.08	Depth to saturated zone	0.14	Hard to reclaim (dense layer)	0.00
	Low content of organic matter	0.12			Carbonate content	0.08
	Droughty	0.37			Depth to saturated zone	0.14
	Water erosion	0.99			Slope	0.96
					Rock fragments	0.97
MhD3:						
Miamian	Fair		Fair		Poor	
	Carbonate content	0.01	Low strength	0.78	Slope	0.00
	Low content of organic matter	0.18			Hard to reclaim (dense layer)	0.80
	Water erosion	0.99				
Losantville	Fair		Fair		Poor	
	Carbonate content	0.08	Depth to saturated zone	0.14	Hard to reclaim (dense layer)	0.00
	Low content of organic matter	0.12			Slope	0.00
	Droughty	0.18			Carbonate content	0.08
	Water erosion	0.99			Depth to saturated zone	0.14
					Rock fragments	0.97
MmE2:						
Miamian	Fair		Fair		Poor	
	Carbonate content	0.01	Slope	0.18	Slope	0.00
	Too clayey	0.05	Low strength	0.78	Too clayey	0.03
	Low content of organic matter	0.18			Hard to reclaim (dense layer)	0.20
	Water erosion	0.99				
Hennepin	Fair		Fair		Poor	
	Low content of organic matter	0.01	Slope	0.18	Slope	0.00
	Carbonate content	0.08			Hard to reclaim (dense layer)	0.00
					Carbonate content	0.08
MnE3:						
Miamian	Fair		Fair		Poor	
	Carbonate content	0.01	Slope	0.18	Slope	0.00
	Low content of organic matter	0.18	Low strength	0.78	Hard to reclaim (dense layer)	0.20
	Water erosion	0.99				
Hennepin	Fair		Fair		Poor	
	Low content of organic matter	0.01	Slope	0.18	Slope	0.00
	Carbonate content	0.08			Hard to reclaim (dense layer)	0.00
					Carbonate content	0.08

Table 21.—Construction Materials Part 2--Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
MpA:						
Milford	Poor		Poor		Poor	
	Too clayey	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.50	Low strength	0.00	Too clayey	0.00
	Carbonate content	0.97	Shrink-swell	0.88		
MrA:						
Milford	Fair		Poor		Poor	
	Too clayey	0.08	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.50	Shrink-swell	0.89	Too clayey	0.07
	Carbonate content	0.97				
MsA:						
Millsdale	Fair		Poor		Poor	
	Depth to bedrock	0.16	Depth to bedrock	0.00	Depth to saturated zone	0.00
	Droughty	0.54	Depth to saturated zone	0.00	Depth to bedrock	0.16
			Low strength	0.00		
			Shrink-swell	0.41		
MtA:						
Millsdale	Poor		Poor		Poor	
	Too clayey	0.00	Depth to bedrock	0.00	Depth to saturated zone	0.00
	Depth to bedrock	0.54	Depth to saturated zone	0.00	Too clayey	0.00
	Droughty	0.83	Low strength	0.00	Depth to bedrock	0.54
			Shrink-swell	0.26		
MuA:						
Milton	Fair		Poor		Fair	
	Too clayey	0.02	Depth to bedrock	0.00	Too clayey	0.01
	Low content of organic matter	0.08	Low strength	0.00	Depth to bedrock	0.65
	Depth to bedrock	0.65	Shrink-swell	0.87		
	Droughty	0.89				
	Water erosion	0.99				
MuB:						
Milton	Fair		Poor		Fair	
	Too clayey	0.02	Depth to bedrock	0.00	Too clayey	0.01
	Low content of organic matter	0.08	Low strength	0.00	Depth to bedrock	0.35
	Depth to bedrock	0.35	Shrink-swell	0.87		
	Droughty	0.69				
	Water erosion	0.99				
MuB2:						
Milton	Fair		Poor		Fair	
	Too clayey	0.05	Depth to bedrock	0.00	Too clayey	0.03
	Depth to bedrock	0.35	Low strength	0.00	Depth to bedrock	0.35
	Droughty	0.52	Shrink-swell	0.87		
	Low content of organic matter	0.75				
	Water erosion	0.99				

Table 21.—Construction Materials Part 2--Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
MuC2:						
Milton	Fair		Poor		Fair	
	Too clayey	0.05	Depth to bedrock	0.00	Too clayey	0.03
	Depth to bedrock	0.35	Low strength	0.00	Depth to bedrock	0.35
	Droughty	0.45	Shrink-swell	0.87	Slope	0.96
	Low content of organic matter	0.75				
	Water erosion	0.99				
MuD2:						
Milton	Fair		Poor		Poor	
	Too clayey	0.05	Depth to bedrock	0.00	Slope	0.00
	Depth to bedrock	0.46	Low strength	0.00	Too clayey	0.03
	Droughty	0.63	Shrink-swell	0.87	Depth to bedrock	0.46
	Low content of organic matter	0.75				
	Water erosion	0.99				
MuE2:						
Milton	Fair		Poor		Poor	
	Too clayey	0.05	Depth to bedrock	0.00	Slope	0.00
	Depth to bedrock	0.05	Low strength	0.00	Too clayey	0.03
	Droughty	0.09	Slope	0.24	Depth to bedrock	0.05
	Low content of organic matter	0.75	Shrink-swell	0.87		
	Water erosion	0.99				
MwA:						
Morningsun	Fair		Poor		Fair	
	Carbonate content	0.32	Low strength	0.00	Hard to reclaim (dense layer)	0.80
	Low content of organic matter	0.88	Depth to saturated zone	0.98	Depth to saturated zone	0.98
	Water erosion	0.99				
MxA:						
Morningsun	Fair		Poor		Fair	
	Carbonate content	0.32	Low strength	0.00	Depth to saturated zone	0.98
	Low content of organic matter	0.88	Depth to saturated zone	0.98	Hard to reclaim (dense layer)	0.99
	Water erosion	0.99				
Xenia	Poor		Fair		Fair	
	Low content of organic matter	0.00	Depth to saturated zone	0.53	Depth to saturated zone	0.53
	Carbonate content	0.16	Shrink-swell	0.98	Hard to reclaim (dense layer)	0.54
	Water erosion	0.99				
MxB:						
Morningsun	Fair		Poor		Fair	
	Carbonate content	0.32	Low strength	0.00	Hard to reclaim (dense layer)	0.84
	Low content of organic matter	0.88	Depth to saturated zone	0.98	Depth to saturated zone	0.98
	Water erosion	0.99				
Xenia	Fair		Fair		Fair	
	Carbonate content	0.16	Depth to saturated zone	0.53	Depth to saturated zone	0.53
	Low content of organic matter	0.68	Shrink-swell	0.95	Hard to reclaim (dense layer)	0.54
	Water erosion	0.99				

Table 21.—Construction Materials Part 2--Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
MxB2:						
Morningsun	Poor		Poor		Fair	
	Low content of organic matter	0.00	Low strength	0.00	Hard to reclaim (dense layer)	0.20
	Carbonate content	0.32	Depth to saturated zone	0.98	Depth to saturated zone	0.98
	Water erosion	0.99				
Xenia	Poor		Fair		Fair	
	Low content of organic matter	0.00	Depth to saturated zone	0.53	Hard to reclaim (dense layer)	0.35
	Carbonate content	0.16	Shrink-swell	0.98	Depth to saturated zone	0.53
	Water erosion	0.99				
MyA:						
Mahalasville	Fair		Poor		Poor	
	Carbonate content	0.92	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Water erosion	0.99	Shrink-swell	0.98		
OcA:						
Ockley	Fair		Fair		Poor	
	Low content of organic matter	0.12	Shrink-swell	0.96	Hard to reclaim, rock fragments	0.00
	Carbonate content	0.68			Rock fragments	0.50
	Water erosion	0.99				
OcB:						
Ockley	Fair		Fair		Poor	
	Low content of organic matter	0.12	Shrink-swell	0.95	Hard to reclaim, rock fragments	0.00
	Carbonate content	0.68			Rock fragments	0.50
	Water erosion	0.99				
Pg:						
Pits, Gravel	Not rated		Not rated		Not rated	
Pq:						
Pits, Quarry	Not rated		Not rated		Not rated	
PtB:						
Plattville	Fair		Poor		Good	
	Low content of organic matter	0.88	Low strength	0.00		
	Carbonate content	0.97	Depth to bedrock	0.87		
RaA:						
Rainsville	Fair		Fair		Poor	
	Carbonate content	0.46	Depth to saturated zone	0.89	Hard to reclaim (dense layer)	0.00
	Water erosion	0.68	Shrink-swell	0.91	Depth to saturated zone	0.89
	Low content of organic matter	0.88			Rock fragments	0.94
					Too acid	0.98

Table 21.—Construction Materials Part 2--Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
RaB:						
Rainsville	Fair		Fair		Poor	
	Carbonate content	0.46	Depth to saturated zone	0.89	Hard to reclaim (dense layer)	0.00
	Water erosion	0.68	Shrink-swell	0.95	Depth to saturated zone	0.89
	Low content of organic matter	0.88			Rock fragments	0.94
					Too acid	0.98
RaB2:						
Rainsville	Fair		Fair		Poor	
	Carbonate content	0.46	Depth to saturated zone	0.89	Hard to reclaim (dense layer)	0.00
	Low content of organic matter	0.88	Shrink-swell	0.94	Depth to saturated zone	0.89
	Water erosion	0.90			Rock fragments	0.94
					Too acid	0.98
RcA:						
Randolph	Poor		Poor		Poor	
	Too clayey	0.00	Depth to bedrock	0.00	Depth to saturated zone	0.00
	Depth to bedrock	0.79	Depth to saturated zone	0.00	Too clayey	0.00
	Droughty	0.83	Low strength	0.00	Depth to bedrock	0.79
	Low content of organic matter	0.88	Shrink-swell	0.97	Rock fragments	0.88
	Water erosion	0.99				
RcB:						
Randolph	Poor		Poor		Poor	
	Too clayey	0.00	Depth to bedrock	0.00	Depth to saturated zone	0.00
	Droughty	0.57	Depth to saturated zone	0.00	Too clayey	0.00
	Depth to bedrock	0.71	Low strength	0.00	Depth to bedrock	0.71
	Low content of organic matter	0.88			Rock fragments	0.88
	Water erosion	0.99				
RnE2:						
Rodman	Poor		Fair		Poor	
	Too sandy	0.00	Slope	0.24	Slope	0.00
	Droughty	0.03			Too sandy	0.00
	Carbonate content	0.46			Hard to reclaim, rock fragments	0.00
	Low content of organic matter	0.50			Rock fragments	0.00
					Carbonate content	0.46
RnF2:						
Rodman	Poor		Poor		Poor	
	Too sandy	0.00	Slope	0.00	Slope	0.00
	Droughty	0.03			Too sandy	0.00
	Carbonate content	0.46			Hard to reclaim, rock fragments	0.00
	Low content of organic matter	0.50			Rock fragments	0.00
					Carbonate content	0.46

Table 21.—Construction Materials Part 2--Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
RoE2:						
Rodman	Poor		Fair		Poor	
	Too sandy	0.00	Slope	0.24	Slope	0.00
	Droughty	0.03			Too sandy	0.00
	Carbonate content	0.46			Hard to reclaim, rock fragments	0.00
	Low content of organic matter	0.50			Rock fragments	0.00
					Carbonate content	0.46
Kendallville	Fair		Poor		Poor	
	Carbonate content	0.16	Low strength	0.00	Slope	0.00
	Low content of organic matter	0.18	Slope	0.24	Rock fragments	0.72
	Water erosion	0.99	Shrink-swell	0.97		
RoF2:						
Rodman	Poor		Poor		Poor	
	Too sandy	0.00	Slope	0.00	Slope	0.00
	Droughty	0.03			Too sandy	0.00
	Carbonate content	0.46			Hard to reclaim, rock fragments	0.00
	Low content of organic matter	0.50			Rock fragments	0.00
					Carbonate content	0.46
Kendallville	Fair		Poor		Poor	
	Carbonate content	0.16	Slope	0.00	Slope	0.00
	Low content of organic matter	0.18	Low strength	0.78	Rock fragments	0.28
	Water erosion	0.99	Shrink-swell	0.99		
RpA:						
Rossburg	Fair		Good		Fair	
	Water erosion	0.99			Hard to reclaim, rock fragments	0.92
RuB:						
Russell	Fair		Poor		Fair	
	Carbonate content	0.80	Low strength	0.00	Hard to reclaim, rock fragments	0.98
	Low content of organic matter	0.88	Shrink-swell	0.89		
	Water erosion	0.99				
Miamian	Fair		Fair		Fair	
	Carbonate content	0.01	Low strength	0.78	Too clayey	0.06
	Too clayey	0.08			Hard to reclaim (dense layer)	0.71
	Low content of organic matter	0.18				
	Water erosion	0.99				
RuB2:						
Russell	Fair		Fair		Good	
	Carbonate content	0.80	Shrink-swell	0.95		
	Low content of organic matter	0.88				
	Water erosion	0.99				

Table 21.—Construction Materials Part 2--Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
Miamian	Fair		Fair		Fair	
	Carbonate content	0.01	Low strength	0.78	Too clayey	0.36
	Low content of organic matter	0.18			Hard to reclaim (dense layer)	0.80
	Too clayey	0.50				
	Water erosion	0.99				
SeA:						
Savona	Poor		Fair		Poor	
	Carbonate content	0.00	Depth to saturated zone	0.12	Hard to reclaim, rock fragments	0.00
	Low content of organic matter	0.00			Too clayey	0.05
	Too clayey	0.08			Depth to saturated zone	0.12
	Water erosion	0.99			Rock fragments	0.28
SnA:						
Sloan	Fair		Poor		Poor	
	Water erosion	0.99	Depth to saturated zone	0.00	Depth to saturated zone	0.00
			Shrink-swell	0.98	Hard to reclaim, rock fragments	0.92
StA:						
Stonelick	Fair		Good		Poor	
	Low content of organic matter	0.01			Hard to reclaim, rock fragments	0.00
	Carbonate content	0.01			Carbonate content	0.01
	Too sandy	0.32			Too sandy	0.32
SvA:						
Sugarvalley	Fair		Poor		Fair	
	Carbonate content	0.32	Low strength	0.00	Depth to saturated zone	0.12
	Low content of organic matter	0.88	Depth to saturated zone	0.12		
	Water erosion	0.99	Shrink-swell	0.96		
SwA:						
Sugarvalley	Fair		Fair		Fair	
	Carbonate content	0.32	Depth to saturated zone	0.12	Depth to saturated zone	0.12
	Low content of organic matter	0.88	Low strength	0.22	Hard to reclaim (dense layer)	0.54
	Water erosion	0.99				
Fincastle	Poor		Poor		Poor	
	Low content of organic matter	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Carbonate content	0.68	Shrink-swell	0.97	Hard to reclaim (dense layer)	0.71
	Water erosion	0.99				
ThA:						
Thackery	Poor		Poor		Poor	
	Low content of organic matter	0.00	Low strength	0.00	Hard to reclaim, rock fragments	0.00
	Carbonate content	0.68	Depth to saturated zone	0.29	Depth to saturated zone	0.29
	Water erosion	0.99	Shrink-swell	0.98	Rock fragments	0.88

Table 21.—Construction Materials Part 2--Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
ThB:						
Thackery	Poor		Poor		Fair	
	Low content of organic matter	0.00	Low strength	0.00	Rock fragments	0.88
	Carbonate content	0.68	Shrink-swell	0.89		
	Water erosion	0.99				
Ud:						
Udorthents	Not rated		Not rated		Not rated	
W:						
Water	Not rated		Not rated		Not rated	
WbA:						
Warsaw	Fair		Good		Poor	
	Low content of organic matter	0.50			Hard to reclaim, rock fragments	0.00
	Carbonate content	0.92				
WnA:						
Westland	Fair		Poor		Poor	
	Carbonate content	0.08	Depth to saturated zone	0.00	Depth to saturated zone	0.00
					Rock fragments	0.00
					Hard to reclaim, rock fragments	0.02
WyB:						
Wynn	Poor		Poor		Fair	
	Low content of organic matter	0.00	Depth to bedrock	0.00	Too clayey	0.04
	Too clayey	0.08	Low strength	0.00	Depth to bedrock	0.65
	Depth to bedrock	0.65	Shrink-swell	0.71		
	Droughty	0.92				
	Water erosion	0.99				
WyB2:						
Wynn	Fair		Poor		Fair	
	Low content of organic matter	0.12	Depth to bedrock	0.00	Too clayey	0.29
	Depth to bedrock	0.35	Low strength	0.00	Depth to bedrock	0.35
	Too clayey	0.50	Shrink-swell	0.82		
	Droughty	0.89				
	Water erosion	0.99				
WyC2:						
Wynn	Fair		Poor		Fair	
	Depth to bedrock	0.05	Depth to bedrock	0.00	Depth to bedrock	0.05
	Low content of organic matter	0.12	Low strength	0.00	Too clayey	0.29
	Droughty	0.46	Shrink-swell	0.87	Slope	0.96
	Too clayey	0.50				
	Water erosion	0.99				
WyD2:						
Wynn	Fair		Poor		Poor	
	Low content of organic matter	0.12	Depth to bedrock	0.00	Slope	0.00
	Depth to bedrock	0.35	Low strength	0.00	Too clayey	0.29
	Too clayey	0.50	Shrink-swell	0.87	Depth to bedrock	0.35
	Droughty	0.91				
	Water erosion	0.99				

Table 21.—Construction Materials Part 2--Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
XeA:						
Xenia	Fair		Fair		Fair	
	Carbonate content	0.16	Depth to saturated zone	0.53	Depth to saturated zone	0.53
	Low content of organic matter	0.68	Shrink-swell	0.96	Hard to reclaim (dense layer)	0.99
	Water erosion	0.99				
XeB:						
Xenia	Fair		Fair		Fair	
	Low content of organic matter	0.12	Depth to saturated zone	0.53	Hard to reclaim (dense layer)	0.46
	Carbonate content	0.16	Shrink-swell	0.89	Depth to saturated zone	0.53
	Water erosion	0.99				
XeB2:						
Xenia	Poor		Fair		Fair	
	Low content of organic matter	0.00	Depth to saturated zone	0.53	Hard to reclaim (dense layer)	0.10
	Carbonate content	0.16	Shrink-swell	0.98	Depth to saturated zone	0.53
	Water erosion	0.99				
XfB:						
Xenia	Fair		Fair		Fair	
	Low content of organic matter	0.12	Depth to saturated zone	0.53	Hard to reclaim (dense layer)	0.20
	Carbonate content	0.16	Shrink-swell	0.97	Depth to saturated zone	0.53
	Water erosion	0.99				

TABLE 22.--BUILDING SITE DEVELOPMENT PART 1

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text on page 207 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
CeA:						
Celina	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
	Depth to saturated zone	0.10			Depth to saturated zone	0.10
CeB:						
Celina	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
	Depth to saturated zone	0.10			Depth to saturated zone	0.10
					Slope	0.10
CeB2:						
Celina	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
	Depth to saturated zone	0.10			Depth to saturated zone	0.10
					Slope	0.10
CoA:						
Corwin	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
	Depth to saturated zone	0.47			Depth to saturated zone	0.47
CtA:						
Crosby	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
Celina	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
	Depth to saturated zone	0.10			Depth to saturated zone	0.10
CtB:						
Crosby	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
Celina	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
	Depth to saturated zone	0.10			Depth to saturated zone	0.10

Table 22.—Building Site Development Part 1--Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
CvA:						
Crosby	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
Lewisburg	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
CyA:						
Cyclone	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
DaA:						
Dana	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	0.99	Shrink-swell	0.50
			Shrink-swell	0.50		
DaB:						
Dana	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	0.99	Shrink-swell	0.50
			Shrink-swell	0.50	Slope	0.10
EeA:						
Eel	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	0.83	Depth to saturated zone	1.00	Depth to saturated zone	0.83
EgA:						
Eldean	Somewhat limited		Not limited		Somewhat limited	
	Shrink-swell	0.50			Shrink-swell	0.50
EgB:						
Eldean	Somewhat limited		Not limited		Somewhat limited	
	Shrink-swell	0.50			Shrink-swell	0.50
					Slope	0.10
EgB2:						
Eldean	Not limited		Not limited		Somewhat limited	
					Slope	0.10
EhC3:						
Eldean	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.04	Slope	0.04	Slope	1.00
EhD3:						
Eldean	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50			Shrink-swell	0.50
EkA:						
Eldean	Somewhat limited		Not limited		Somewhat limited	
	Shrink-swell	0.50			Shrink-swell	0.50

Table 22.—Building Site Development Part 1--Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
EkB:						
Eldean	Somewhat limited		Not limited		Somewhat limited	
	Shrink-swell	0.50			Shrink-swell	0.50
					Slope	0.10
EkB2:						
Eldean	Somewhat limited		Not limited		Somewhat limited	
	Shrink-swell	0.50			Shrink-swell	0.50
					Slope	0.10
FcA:						
Fincastle	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
FdA:						
Fincastle	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
FmA:						
Fox	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
FmB:						
Fox	Somewhat limited		Not limited		Somewhat limited	
	Shrink-swell	0.50			Shrink-swell	0.50
					Slope	0.10
FmB2:						
Fox	Somewhat limited		Not limited		Somewhat limited	
	Shrink-swell	0.50			Shrink-swell	0.50
					Slope	0.10
HeF2:						
Hennepin	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50	Depth to saturated zone	0.95	Shrink-swell	0.50
HwE2:						
Hennepin	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
Wynn	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
			Depth to soft bedrock	0.46		
HwF2:						
Hennepin	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
Wynn	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50	Depth to soft bedrock	0.90	Shrink-swell	0.50
			Shrink-swell	0.50		

Table 22.—Building Site Development Part 1--Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
KeC2:						
Kendallville	Somewhat limited		Somewhat limited		Very limited	
	Shrink-swell	0.50	Slope	0.04	Slope	1.00
	Slope	0.04			Shrink-swell	0.50
Eldean	Somewhat limited		Somewhat limited		Very limited	
	Shrink-swell	0.50	Slope	0.04	Slope	1.00
	Slope	0.04			Shrink-swell	0.50
KeD2:						
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50			Shrink-swell	0.50
Eldean	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50			Shrink-swell	0.50
KnA:						
Kokomo	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
KoA:						
Kokomo	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
LeB:						
Lewisburg	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	0.10
Celina	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
	Depth to saturated zone	0.10			Depth to saturated zone	0.10
					Slope	0.10
LfB2:						
Lewisburg	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	0.10
Celina	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
	Depth to saturated zone	0.10			Depth to saturated zone	0.10
					Slope	0.10
LgC3:						
Lewisburg	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Slope	0.04	Slope	0.04	Slope	1.00

Table 22.—Building Site Development Part 1--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
LpA:						
Lippincott	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Shrink-swell	0.50			Shrink-swell	0.50
MaA:						
Medway	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Flooding	1.00
			Depth to saturated zone	0.99		
MbB2:						
Miami	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	0.99	Shrink-swell	0.50
					Slope	0.19
McE2:						
Miami	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50	Depth to saturated zone	0.99	Shrink-swell	0.50
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50			Shrink-swell	0.50
McF2:						
Miami	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50	Depth to saturated zone	0.99	Shrink-swell	0.50
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50			Shrink-swell	0.50
MdC2:						
Miami	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.04	Depth to saturated zone	0.99	Slope	1.00
			Slope	0.04		
MdD2:						
Miami	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50	Depth to saturated zone	0.99	Shrink-swell	0.50
MeC:						
Miamian	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.04	Depth to saturated zone	0.95	Slope	1.00
			Slope	0.04		
MeC2:						
Miamian	Somewhat limited		Somewhat limited		Very limited	
	Shrink-swell	0.50	Depth to saturated zone	0.95	Slope	1.00
	Slope	0.04	Slope	0.04	Shrink-swell	0.50

Table 22.—Building Site Development Part 1--Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
MeD2:						
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50	Depth to saturated zone	0.95	Shrink-swell	0.50
MfB:						
Miamian	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	0.95	Shrink-swell	0.50
					Slope	0.10
Celina	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
	Depth to saturated zone	0.10			Depth to saturated zone	0.10
					Slope	0.10
MfB2:						
Miamian	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	0.95	Shrink-swell	0.50
					Slope	0.10
Celina	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
	Depth to saturated zone	0.10			Depth to saturated zone	0.10
					Slope	0.10
MgE2:						
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50	Depth to saturated zone	0.95	Shrink-swell	0.50
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50			Shrink-swell	0.50
MgF2:						
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50	Depth to saturated zone	0.95	Shrink-swell	0.50
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50			Shrink-swell	0.50
MhC3:						
Miamian	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.04	Depth to saturated zone	0.95	Slope	1.00
			Slope	0.04		
Losantville	Somewhat limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope	1.00
	Slope	0.04	Slope	0.04	Depth to saturated zone	1.00

Table 22.—Building Site Development Part 1--Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
MhD3:						
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50	Depth to saturated zone	0.95	Shrink-swell	0.50
Losantville	Very limited		Very limited		Very limited	
	Slope	1.00	Depth to saturated zone	1.00	Slope	1.00
	Depth to saturated zone	1.00	Slope	1.00	Depth to saturated zone	1.00
MmE2:						
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
			Depth to saturated zone	0.95		
Hennepin	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
MnE3:						
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
			Depth to saturated zone	0.95		
Hennepin	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
MpA:						
Milford	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Shrink-swell	0.94			Shrink-swell	0.94
MrA:						
Milford	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Shrink-swell	0.94			Shrink-swell	0.94
MsA:						
Millsdale	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
	Ponding	1.00	Depth to hard bedrock	1.00	Ponding	1.00
	Depth to hard bedrock	0.84	Ponding	1.00	Depth to hard bedrock	0.84
MtA:						
Millsdale	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
	Ponding	1.00	Depth to hard bedrock	1.00	Ponding	1.00
	Depth to hard bedrock	0.46	Ponding	1.00	Depth to hard bedrock	0.46

Table 22.—Building Site Development Part 1--Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
MuA:						
Milton	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to hard bedrock	1.00	Shrink-swell	0.50
	Depth to hard bedrock	0.35	Shrink-swell	0.50	Depth to hard bedrock	0.35
MuB:						
Milton	Somewhat limited		Very limited		Somewhat limited	
	Depth to hard bedrock	0.64	Depth to hard bedrock	1.00	Depth to hard bedrock	0.64
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
					Slope	0.10
MuB2:						
Milton	Somewhat limited		Very limited		Somewhat limited	
	Depth to hard bedrock	0.64	Depth to hard bedrock	1.00	Depth to hard bedrock	0.64
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
					Slope	0.10
MuC2:						
Milton	Somewhat limited		Very limited		Very limited	
	Depth to hard bedrock	0.64	Depth to hard bedrock	1.00	Slope	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Depth to hard bedrock	0.64
	Slope	0.04	Slope	0.04	Shrink-swell	0.50
MuD2:						
Milton	Very limited		Very limited		Very limited	
	Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
	Depth to hard bedrock	0.54	Slope	1.00	Depth to hard bedrock	0.54
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
MuE2:						
Milton	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Depth to hard bedrock	0.95	Depth to hard bedrock	1.00	Depth to hard bedrock	0.95
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
MwA:						
Morningsun	Not limited		Somewhat limited		Not limited	
			Depth to saturated zone	0.99		
MxA:						
Morningsun	Not limited		Somewhat limited		Not limited	
			Depth to saturated zone	0.99		
Xenia	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
	Depth to saturated zone	0.47			Depth to saturated zone	0.47
MxB:						
Morningsun	Not limited		Somewhat limited		Somewhat limited	
			Depth to saturated zone	0.99	Slope	0.10

Table 22.—Building Site Development Part 1--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
Xenia	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
	Depth to saturated zone	0.47			Depth to saturated zone	0.47
					Slope	0.10
MxB2:						
Morningsun	Not limited		Somewhat limited		Somewhat limited	
			Depth to saturated zone	0.99	Slope	0.10
Xenia	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
	Depth to saturated zone	0.47			Depth to saturated zone	0.47
					Slope	0.10
MyA:						
Mahalasville	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
OcA:						
Ockley	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
OcB:						
Ockley	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
					Slope	0.10
Pg:						
Pits, Gravel	Not Rated		Not Rated		Not Rated	
Pq:						
Pits, Quarry	Not Rated		Not Rated		Not Rated	
PtB:						
Plattville	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	0.95	Shrink-swell	0.50
			Shrink-swell	0.50	Slope	0.10
			Depth to hard bedrock	0.13		
RaA:						
Rainsville	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
			Shrink-swell	0.50		
RaB:						
Rainsville	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
			Shrink-swell	0.50	Slope	0.19

Table 22.—Building Site Development Part 1--Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
RaB2:						
Rainsville	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
			Shrink-swell	0.50	Slope	0.19
RcA:						
Randolph	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	Depth to hard bedrock	1.00	Shrink-swell	0.50
	Depth to hard bedrock	0.20	Shrink-swell	0.50	Depth to hard bedrock	0.20
RcB:						
Randolph	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	Depth to hard bedrock	1.00	Shrink-swell	0.50
	Depth to hard bedrock	0.29	Shrink-swell	0.50	Depth to hard bedrock	0.29
					Slope	0.10
RnE2:						
Rodman	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
RnF2:						
Rodman	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
RoE2:						
Rodman	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
RoF2:						
Rodman	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50			Shrink-swell	0.50
RpA:						
Rossburg	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Flooding	1.00
			Depth to saturated zone	0.24		
RuB:						
Russell	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
			Depth to saturated zone	0.24	Slope	0.10

Table 22.—Building Site Development Part 1--Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
Miamian	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	0.95	Shrink-swell	0.50
					Slope	0.10
RuB2:						
Russell	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
			Depth to saturated zone	0.24	Slope	0.10
Miamian	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	0.95	Shrink-swell	0.50
					Slope	0.10
SeA:						
Savona	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
SnA:						
Sloan	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
StA:						
Stonelick	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Flooding	1.00
SvA:						
Sugarvalley	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
SwA:						
Sugarvalley	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
Fincastle	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
ThA:						
Thackery	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.87	Depth to saturated zone	1.00	Depth to saturated zone	0.87
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
ThB:						
Thackery	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	0.95	Shrink-swell	0.50
			Shrink-swell	0.50	Slope	0.10

Table 22.—Building Site Development Part 1--Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
Ud:						
Udorthents	Not Rated		Not Rated		Not Rated	
W:						
Water	Not Rated		Not Rated		Not Rated	
WbA:						
Warsaw	Not limited		Not limited		Not limited	
WnA:						
Westland	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
WyB:						
Wynn	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.94	Shrink-swell	0.94	Shrink-swell	0.94
			Depth to soft bedrock	0.35	Slope	0.10
WyB2:						
Wynn	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Depth to soft bedrock	0.64	Shrink-swell	0.50
			Shrink-swell	0.50	Slope	0.10
WyC2:						
Wynn	Somewhat limited		Somewhat limited		Very limited	
	Shrink-swell	0.50	Depth to soft bedrock	0.95	Slope	1.00
	Slope	0.04	Shrink-swell	0.50	Shrink-swell	0.50
			Slope	0.04		
WyD2:						
Wynn	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50	Depth to soft bedrock	0.64	Shrink-swell	0.50
			Shrink-swell	0.50		
XeA:						
Xenia	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
	Depth to saturated zone	0.47	Shrink-swell	0.50	Depth to saturated zone	0.47
XeB:						
Xenia	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
	Depth to saturated zone	0.47	Shrink-swell	0.50	Depth to saturated zone	0.47
					Slope	0.10
XeB2:						
Xenia	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
	Depth to saturated zone	0.47			Depth to saturated zone	0.47
					Slope	0.10

Table 22.—Building Site Development Part 1--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
XfB:						
Xenia	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
	Depth to saturated zone	0.47	Shrink-swell	0.50	Depth to saturated zone	0.47
					Slope	0.10

TABLE 23.--BUILDING SITE DEVELOPMENT PART 2

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text on page 207 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
CeA:						
Celina	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.03
	Frost action	1.00				
	Shrink-swell	0.50				
	Depth to saturated zone	0.03				
CeB:						
Celina	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.03
	Frost action	1.00				
	Shrink-swell	0.50				
	Depth to saturated zone	0.03				
CeB2:						
Celina	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.03
	Frost action	1.00				
	Shrink-swell	0.50				
	Depth to saturated zone	0.03				
CoA:						
Corwin	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.19
	Shrink-swell	0.50	Depth to dense layer	0.50		
	Frost action	0.50				
	Depth to saturated zone	0.19				
CtA:						
Crosby	Very limited		Very limited		Very limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to dense layer	0.50		
	Depth to saturated zone	1.00	Too clayey	0.50		
	Shrink-swell	0.50				
Celina	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.03
	Frost action	1.00				
	Shrink-swell	0.50				
	Depth to saturated zone	0.03				

Table 23.—Building Site Development Part 2--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations		Lawns and landscaping	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CtB:						
Crosby	Very limited		Very limited		Very limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Depth to dense layer	0.50		
	Depth to saturated zone	1.00	Too clayey	0.50		
	Shrink-swell	0.50				
Celina	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.03
	Frost action	1.00				
	Shrink-swell	0.50				
	Depth to saturated zone	0.03				
CvA:						
Crosby	Very limited		Very limited		Very limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to dense layer	0.50		
	Depth to saturated zone	1.00				
	Shrink-swell	0.50				
Lewisburg	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.78
	Depth to saturated zone	0.78	Depth to dense layer	0.50		
	Low strength	0.28				
CyA:						
Cyclone	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Ponding	1.00	Ponding	1.00
	Frost action	1.00				
	Ponding	1.00				
	Shrink-swell	0.50				
DaA:						
Dana	Very limited		Somewhat limited		Not limited	
	Low strength	1.00	Depth to saturated zone	0.99		
	Frost action	1.00				
	Shrink-swell	0.50				
DaB:						
Dana	Very limited		Somewhat limited		Not limited	
	Low strength	1.00	Depth to saturated zone	0.99		
	Frost action	1.00				
	Shrink-swell	0.50				

Table 23.—Building Site Development Part 2—Continued

Map symbol and soil name	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
EeA:						
Eel	Very limited		Very limited		Somewhat limited	
	Flooding	1.00	Depth to saturated zone	1.00	Flooding	0.60
	Frost action	1.00	Flooding	0.60	Depth to saturated zone	0.43
	Depth to saturated zone	0.43				
EgA:						
Eldean	Very limited		Very limited		Very limited	
	Low strength	1.00	Cutbanks cave	1.00	Carbonate content	1.00
	Shrink-swell	0.50			Gravel content	0.04
	Frost action	0.50			Droughty	0.02
					Content of large stones	0.01
EgB:						
Eldean	Very limited		Very limited		Very limited	
	Low strength	1.00	Cutbanks cave	1.00	Carbonate content	1.00
	Shrink-swell	0.50			Gravel content	0.04
	Frost action	0.50			Droughty	0.02
					Content of large stones	0.01
EgB2:						
Eldean	Somewhat limited		Very limited		Very limited	
	Frost action	0.50	Cutbanks cave	1.00	Carbonate content	1.00
					Droughty	0.13
					Gravel content	0.04
					Content of large stones	0.01
EhC3:						
Eldean	Somewhat limited		Very limited		Very limited	
	Frost action	0.50	Cutbanks cave	1.00	Carbonate content	1.00
	Slope	0.04	Slope	0.04	Droughty	0.28
					Slope	0.04
					Gravel content	0.04
					Content of large stones	0.01
EhD3:						
Eldean	Very limited		Very limited		Very limited	
	Low strength	1.00	Cutbanks cave	1.00	Carbonate content	1.00
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50	Too clayey	0.50	Gravel content	0.04
	Frost action	0.50			Content of large stones	0.01
EkA:						
Eldean	Very limited		Very limited		Very limited	
	Low strength	1.00	Cutbanks cave	1.00	Carbonate content	1.00
	Shrink-swell	0.50	Too clayey	0.50		
	Frost action	0.50				
EkB:						
Eldean	Very limited		Very limited		Very limited	
	Low strength	1.00	Cutbanks cave	1.00	Carbonate content	1.00
	Shrink-swell	0.50	Too clayey	0.50		
	Frost action	0.50				

Table 23.—Building Site Development Part 2--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations		Lawns and landscaping	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
EkB2:						
Eldean	Very limited		Very limited		Very limited	
	Low strength	1.00	Cutbanks cave	1.00	Carbonate content	1.00
	Shrink-swell	0.50	Too clayey	0.50		
	Frost action	0.50				
FcA:						
Fincastle	Very limited		Very limited		Very limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to dense layer	0.50		
	Depth to saturated zone	1.00				
	Shrink-swell	0.50				
FdA:						
Fincastle	Very limited		Very limited		Very limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to dense layer	0.50		
	Depth to saturated zone	1.00				
	Shrink-swell	0.50				
FmA:						
Fox	Somewhat limited		Very limited		Not limited	
	Shrink-swell	0.50	Cutbanks cave	1.00		
	Frost action	0.50				
FmB:						
Fox	Somewhat limited		Very limited		Not limited	
	Shrink-swell	0.50	Cutbanks cave	1.00		
	Frost action	0.50				
FmB2:						
Fox	Somewhat limited		Very limited		Not limited	
	Shrink-swell	0.50	Cutbanks cave	1.00		
	Frost action	0.50				
HeF2:						
Hennepin	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Frost action	0.50	Depth to dense layer	0.50		
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Frost action	0.50	Depth to saturated zone	0.95		
	Low strength	0.28	Depth to dense layer	0.50		
HwE2:						
Hennepin	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Frost action	0.50	Depth to dense layer	0.50		

Table 23.—Building Site Development Part 2--Continued

Map symbol and soil name	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
Wynn	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	1.00	Depth to soft bedrock	0.46	Depth to bedrock	0.46
	Shrink-swell	0.50				
	Frost action	0.50				
HwF2:						
Hennepin	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Frost action	0.50	Depth to dense layer	0.50		
Wynn	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	1.00	Depth to soft bedrock	0.90	Depth to bedrock	0.90
	Shrink-swell	0.50				
	Frost action	0.50				
KeC2:						
Kendallville	Very limited		Somewhat limited		Somewhat limited	
	Low strength	1.00	Depth to dense layer	0.50	Slope	0.04
	Shrink-swell	0.50	Slope	0.04		
	Frost action	0.50				
	Slope	0.04				
Eldean	Very limited		Very limited		Very limited	
	Low strength	1.00	Cutbanks cave	1.00	Carbonate content	1.00
	Shrink-swell	0.50	Slope	0.04	Slope	0.04
	Frost action	0.50			Droughty	0.04
	Slope	0.04				
KeD2:						
Kendallville	Very limited		Very limited		Very limited	
	Low strength	1.00	Slope	1.00	Slope	1.00
	Slope	1.00	Depth to dense layer	0.50		
	Shrink-swell	0.50				
	Frost action	0.50				
Eldean	Very limited		Very limited		Very limited	
	Low strength	1.00	Cutbanks cave	1.00	Carbonate content	1.00
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50				
	Frost action	0.50				
KnA:						
Kokomo	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Ponding	1.00	Ponding	1.00
	Frost action	1.00				
	Ponding	1.00				
	Shrink-swell	0.50				

Table 23.—Building Site Development Part 2--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations		Lawns and landscaping	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
KoA:						
Kokomo	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Ponding	1.00	Ponding	1.00
	Frost action	1.00				
	Ponding	1.00				
	Shrink-swell	0.50				
LeB:						
Lewisburg	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.78
	Low strength	0.90	Depth to dense layer	0.50		
	Depth to saturated zone	0.78				
Celina	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.03
	Frost action	1.00				
	Shrink-swell	0.50				
	Depth to saturated zone	0.03				
LfB2:						
Lewisburg	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.78
	Low strength	0.90	Depth to dense layer	0.50		
	Depth to saturated zone	0.78				
Celina	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.03
	Frost action	1.00				
	Shrink-swell	0.50				
	Depth to saturated zone	0.03				
LgC3:						
Lewisburg	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.78
	Low strength	0.90	Depth to dense layer	0.50	Slope	0.04
	Depth to saturated zone	0.78	Slope	0.04		
	Slope	0.04				
LpA:						
Lippincott	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	Carbonate content	1.00
	Low strength	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00				
	Shrink-swell	0.50				

Table 23.—Building Site Development Part 2--Continued

Map symbol and soil name	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
MaA:						
Medway	Very limited		Somewhat limited		Somewhat limited	
	Flooding	1.00	Depth to saturated zone	0.99	Flooding	0.60
	Frost action	1.00	Flooding	0.60		
	Low strength	1.00				
MbB2:						
Miami	Very limited		Somewhat limited		Not limited	
	Low strength	1.00	Depth to saturated zone	0.99		
	Shrink-swell	0.50	Depth to dense layer	0.50		
	Frost action	0.50				
McE2:						
Miami	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	1.00	Depth to saturated zone	0.99		
	Shrink-swell	0.50	Depth to dense layer	0.50		
	Frost action	0.50				
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	1.00	Depth to dense layer	0.50		
	Shrink-swell	0.50				
	Frost action	0.50				
McF2:						
Miami	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	1.00	Depth to saturated zone	0.99		
	Shrink-swell	0.50	Depth to dense layer	0.50		
	Frost action	0.50				
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	1.00	Depth to dense layer	0.50		
	Shrink-swell	0.50				
	Frost action	0.50				
MdC2:						
Miami	Somewhat limited		Somewhat limited		Somewhat limited	
	Frost action	0.50	Depth to saturated zone	0.99	Slope	0.04
	Slope	0.04	Depth to dense layer	0.50		
			Slope	0.04		
MdD2:						
Miami	Very limited		Very limited		Very limited	
	Low strength	1.00	Slope	1.00	Slope	1.00
	Slope	1.00	Depth to saturated zone	0.99		
	Shrink-swell	0.50	Depth to dense layer	0.50		
	Frost action	0.50				

Table 23.—Building Site Development Part 2--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations		Lawns and landscaping	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MeC:						
Miamian	Somewhat limited		Somewhat limited		Somewhat limited	
	Frost action	0.50	Depth to saturated zone	0.95	Slope	0.04
	Low strength	0.28	Depth to dense layer	0.50		
	Slope	0.04	Slope	0.04		
MeC2:						
Miamian	Very limited		Somewhat limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	0.95	Slope	0.04
	Shrink-swell	0.50	Depth to dense layer	0.50		
	Frost action	0.50	Slope	0.04		
	Slope	0.04				
MeD2:						
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Frost action	0.50	Depth to saturated zone	0.95		
	Low strength	0.28	Depth to dense layer	0.50		
MfB:						
Miamian	Very limited		Somewhat limited		Not limited	
	Low strength	1.00	Depth to saturated zone	0.95		
	Shrink-swell	0.50	Depth to dense layer	0.50		
	Frost action	0.50				
Celina	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.03
	Frost action	1.00				
	Shrink-swell	0.50				
	Depth to saturated zone	0.03				
MfB2:						
Miamian	Very limited		Somewhat limited		Not limited	
	Low strength	1.00	Depth to saturated zone	0.95		
	Shrink-swell	0.50	Depth to dense layer	0.50		
	Frost action	0.50				
Celina	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.03
	Frost action	1.00				
	Shrink-swell	0.50				
	Depth to saturated zone	0.03				

Table 23.—Building Site Development Part 2--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations		Lawns and landscaping	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MgE2:						
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	1.00	Depth to saturated zone	0.95		
	Shrink-swell	0.50	Depth to dense layer	0.50		
	Frost action	0.50				
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	1.00	Depth to dense layer	0.50		
	Shrink-swell	0.50				
	Frost action	0.50				
MgF2:						
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	1.00	Depth to saturated zone	0.95		
	Shrink-swell	0.50	Depth to dense layer	0.50		
	Frost action	0.50				
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	1.00	Depth to dense layer	0.50		
	Shrink-swell	0.50				
	Frost action	0.50				
MhC3:						
Miamian	Somewhat limited		Somewhat limited		Somewhat limited	
	Frost action	0.50	Depth to saturated zone	0.95	Slope	0.04
	Low strength	0.28	Depth to dense layer	0.50		
	Slope	0.04	Slope	0.04		
Losantville	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.75	Depth to saturated zone	1.00	Depth to saturated zone	0.75
	Frost action	0.50	Depth to dense layer	0.50	Droughty	0.49
	Low strength	0.05	Slope	0.04	Slope	0.04
	Slope	0.04				
MhD3:						
Miamian	Very limited		Very limited		Very limited	
	Low strength	1.00	Slope	1.00	Slope	1.00
	Slope	1.00	Depth to saturated zone	0.95		
	Shrink-swell	0.50	Depth to dense layer	0.50		
	Frost action	0.50				

Table 23.—Building Site Development Part 2--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations		Lawns and landscaping	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Losantville---------	Very limited		Very limited		Very limited	
	Slope	1.00	Depth to saturated zone	1.00	Slope	1.00
	Depth to saturated zone	0.75	Slope	1.00	Droughty	0.80
	Frost action	0.50	Depth to dense layer	0.50	Depth to saturated zone	0.75
	Low strength	0.05				
MmE2:						
Miamian----------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Frost action	0.50	Depth to saturated zone	0.95		
	Low strength	0.28	Depth to dense layer	0.50		
Hennepin----------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Frost action	0.50	Depth to dense layer	0.50		
MnE3:						
Miamian----------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Frost action	0.50	Depth to saturated zone	0.95		
	Low strength	0.28	Depth to dense layer	0.50		
Hennepin----------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Frost action	0.50	Depth to dense layer	0.50		
MpA:						
Milford----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Ponding	1.00	Ponding	1.00
	Frost action	1.00	Too clayey	0.50		
	Ponding	1.00				
	Shrink-swell	0.94				
MrA:						
Milford----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Frost action	1.00	Ponding	1.00		
	Ponding	1.00	Too clayey	0.50		
	Shrink-swell	0.94				
MsA:						
Millsdale----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to hard bedrock	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Frost action	1.00	Ponding	1.00	Depth to bedrock	0.84
	Shrink-swell	1.00	Too clayey	0.50		
	Ponding	1.00				

Table 23.—Building Site Development Part 2--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations		Lawns and landscaping	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MtA:						
Millsdale	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to hard bedrock	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Frost action	1.00	Ponding	1.00	Depth to bedrock	0.46
	Shrink-swell	1.00	Too clayey	0.50		
	Ponding	1.00				
MuA:						
Milton	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to hard bedrock	1.00	Depth to bedrock	0.35
	Shrink-swell	0.50				
	Frost action	0.50				
	Depth to hard bedrock	0.35				
MuB:						
Milton	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to hard bedrock	1.00	Depth to bedrock	0.65
	Depth to hard bedrock	0.64				
	Shrink-swell	0.50				
	Frost action	0.50				
MuB2:						
Milton	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to hard bedrock	1.00	Depth to bedrock	0.65
	Depth to hard bedrock	0.64				
	Shrink-swell	0.50				
	Frost action	0.50				
MuC2:						
Milton	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to hard bedrock	1.00	Depth to bedrock	0.65
	Depth to hard bedrock	0.64	Slope	0.04	Slope	0.04
	Shrink-swell	0.50				
	Frost action	0.50				
	Slope	0.04				
MuD2:						
Milton	Very limited		Very limited		Very limited	
	Low strength	1.00	Depth to hard bedrock	1.00	Slope	1.00
	Slope	1.00	Slope	1.00	Depth to bedrock	0.54
	Depth to hard bedrock	0.54				
	Shrink-swell	0.50				
	Frost action	0.50				

Table 23.—Building Site Development Part 2--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations		Lawns and landscaping	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MuE2:						
Milton	Very limited		Very limited		Very limited	
	Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
	Low strength	1.00	Slope	1.00	Depth to bedrock	0.95
	Depth to hard bedrock	0.95	Too clayey	0.50	Droughty	0.08
	Shrink-swell	0.50				
	Frost action	0.50				
MwA:						
Morningsun	Very limited		Very limited		Not limited	
	Low strength	1.00	Cutbanks cave	1.00		
	Frost action	1.00	Depth to saturated zone	0.99		
			Depth to dense layer	0.50		
MxA:						
Morningsun	Very limited		Very limited		Not limited	
	Low strength	1.00	Cutbanks cave	1.00		
	Frost action	1.00	Depth to saturated zone	0.99		
			Depth to dense layer	0.50		
Xenia	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.19
	Frost action	1.00				
	Shrink-swell	0.50				
	Depth to saturated zone	0.19				
MxB:						
Morningsun	Very limited		Very limited		Not limited	
	Low strength	1.00	Cutbanks cave	1.00		
	Frost action	1.00	Depth to saturated zone	0.99		
			Depth to dense layer	0.50		
Xenia	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.19
	Frost action	1.00				
	Shrink-swell	0.50				
	Depth to saturated zone	0.19				
MxB2:						
Morningsun	Very limited		Very limited		Not limited	
	Low strength	1.00	Cutbanks cave	1.00		
	Frost action	1.00	Depth to saturated zone	0.99		
			Depth to dense layer	0.50		

Table 23.—Building Site Development Part 2--Continued

Map symbol and soil name	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
Xenia	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.19
	Frost action	1.00				
	Shrink-swell	0.50				
	Depth to saturated zone	0.19				
MyA:						
Mahalasville	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Frost action	1.00	Ponding	1.00		
	Ponding	1.00				
	Shrink-swell	0.50				
OcA:						
Ockley	Somewhat limited		Very limited		Not limited	
	Shrink-swell	0.50	Cutbanks cave	1.00		
	Frost action	0.50				
OcB:						
Ockley	Somewhat limited		Very limited		Not limited	
	Shrink-swell	0.50	Cutbanks cave	1.00		
	Frost action	0.50				
Pg:						
Pits, Gravel	Not Rated		Not Rated		Not Rated	
Pq:						
Pits, Quarry	Not Rated		Not Rated		Not Rated	
PtB:						
Plattville	Very limited		Somewhat limited		Not limited	
	Low strength	1.00	Depth to saturated zone	0.95		
	Shrink-swell	0.50	Depth to hard bedrock	0.13		
	Frost action	0.50				
RaA:						
Rainsville	Somewhat limited		Very limited		Not limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00		
	Frost action	0.50				
	Low strength	0.05				
RaB:						
Rainsville	Somewhat limited		Very limited		Not limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00		
	Frost action	0.50				
	Low strength	0.05				
RaB2:						
Rainsville	Somewhat limited		Very limited		Not limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00		
	Frost action	0.50				
	Low strength	0.05				

Table 23.—Building Site Development Part 2--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations		Lawns and landscaping	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
RcA:						
Randolph	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to hard bedrock	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Depth to saturated zone	1.00	Depth to bedrock	0.20
	Frost action	1.00	Too clayey	0.50		
	Shrink-swell	0.50				
	Depth to hard bedrock	0.20				
RcB:						
Randolph	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to hard bedrock	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Depth to saturated zone	1.00	Depth to bedrock	0.29
	Frost action	1.00	Too clayey	0.50		
	Shrink-swell	0.50				
	Depth to hard bedrock	0.29				
RnE2:						
Rodman	Very limited		Very limited		Very limited	
	Slope	1.00	Cutbanks cave	1.00	Slope	1.00
			Slope	1.00	Droughty	0.99
					Gravel content	0.07
RnF2:						
Rodman	Very limited		Very limited		Very limited	
	Slope	1.00	Cutbanks cave	1.00	Slope	1.00
			Slope	1.00	Droughty	0.99
					Gravel content	0.07
RoE2:						
Rodman	Very limited		Very limited		Very limited	
	Slope	1.00	Cutbanks cave	1.00	Slope	1.00
			Slope	1.00	Droughty	0.99
					Gravel content	0.07
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	1.00	Depth to dense layer	0.50		
	Shrink-swell	0.50				
	Frost action	0.50				
RoF2:						
Rodman	Very limited		Very limited		Very limited	
	Slope	1.00	Cutbanks cave	1.00	Slope	1.00
			Slope	1.00	Droughty	0.99
					Gravel content	0.07
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	1.00	Depth to dense layer	0.50		
	Shrink-swell	0.50				
	Frost action	0.50				

Table 23.—Building Site Development Part 2--Continued

Map symbol and soil name	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
RpA:						
Rossburg	Very limited		Very limited		Somewhat limited	
	Flooding	1.00	Cutbanks cave	1.00	Flooding	0.60
	Low strength	0.50	Flooding	0.60		
	Frost action	0.50	Depth to saturated zone	0.24		
RuB:						
Russell	Very limited		Somewhat limited		Not limited	
	Low strength	1.00	Depth to saturated zone	0.24		
	Frost action	1.00				
	Shrink-swell	0.50				
Miamian	Very limited		Somewhat limited		Not limited	
	Low strength	1.00	Depth to saturated zone	0.95		
	Shrink-swell	0.50	Depth to dense layer	0.50		
	Frost action	0.50				
RuB2:						
Russell	Very limited		Somewhat limited		Not limited	
	Low strength	1.00	Depth to saturated zone	0.24		
	Frost action	1.00				
	Shrink-swell	0.50				
Miamian	Very limited		Somewhat limited		Not limited	
	Low strength	1.00	Depth to saturated zone	0.95		
	Shrink-swell	0.50	Depth to dense layer	0.50		
	Frost action	0.50				
SeA:						
Savona	Very limited		Very limited		Very limited	
	Low strength	1.00	Cutbanks cave	1.00	Carbonate content	1.00
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.78
	Depth to saturated zone	0.78				
	Shrink-swell	0.50				
SnA:						
Sloan	Very limited		Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Flooding	0.80	Ponding	1.00
	Ponding	1.00				
	Shrink-swell	0.50				
StA:						
Stonelick	Very limited		Very limited		Very limited	
	Flooding	1.00	Cutbanks cave	1.00	Flooding	1.00
	Frost action	0.50	Flooding	0.80		

Table 23.—Building Site Development Part 2--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations		Lawns and landscaping	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SvA:						
Sugarvalley	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.78
	Frost action	1.00				
	Depth to saturated zone	0.78				
	Shrink-swell	0.50				
SwA:						
Sugarvalley	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.78
	Frost action	1.00	Depth to dense layer	0.50		
	Depth to saturated zone	0.78				
	Shrink-swell	0.50				
Fincastle	Very limited		Very limited		Very limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00				
	Depth to saturated zone	1.00				
	Shrink-swell	0.50				
ThA:						
Thackery	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Cutbanks cave	1.00	Depth to saturated zone	0.48
	Low strength	1.00	Depth to saturated zone	1.00		
	Shrink-swell	0.50				
	Depth to saturated zone	0.48				
ThB:						
Thackery	Very limited		Somewhat limited		Not limited	
	Frost action	1.00	Depth to saturated zone	0.95		
	Low strength	1.00				
	Shrink-swell	0.50				
Ud:						
Udorthents	Not Rated		Not Rated		Not Rated	
W:						
Water	Not Rated		Not Rated		Not Rated	
WbA:						
Warsaw	Somewhat limited		Very limited		Not limited	
	Frost action	0.50	Cutbanks cave	1.00		
WnA:						
Westland	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00	Ponding	1.00		
			Depth to dense layer	0.50		

Table 23.—Building Site Development Part 2--Continued

Map symbol and soil name	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
WyB:						
Wynn	Very limited		Somewhat limited		Somewhat limited	
	Low strength	1.00	Depth to soft bedrock	0.35	Depth to bedrock	0.35
	Shrink-swell	0.94				
	Frost action	0.50				
WyB2:						
Wynn	Very limited		Somewhat limited		Somewhat limited	
	Low strength	1.00	Depth to soft bedrock	0.64	Depth to bedrock	0.65
	Shrink-swell	0.50				
	Frost action	0.50				
WyC2:						
Wynn	Very limited		Somewhat limited		Somewhat limited	
	Low strength	1.00	Depth to soft bedrock	0.95	Depth to bedrock	0.95
	Shrink-swell	0.50	Slope	0.04	Slope	0.04
	Frost action	0.50				
	Slope	0.04				
WyD2:						
Wynn	Very limited		Very limited		Very limited	
	Low strength	1.00	Slope	1.00	Slope	1.00
	Slope	1.00	Depth to soft bedrock	0.64	Depth to bedrock	0.65
	Shrink-swell	0.50				
	Frost action	0.50				
XeA:						
Xenia	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.19
	Frost action	1.00				
	Shrink-swell	0.50				
	Depth to saturated zone	0.19				
XeB:						
Xenia	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.19
	Frost action	1.00				
	Shrink-swell	0.50				
	Depth to saturated zone	0.19				
XeB2:						
Xenia	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.19
	Shrink-swell	0.50				
	Depth to saturated zone	0.19				
XfB:						
Xenia	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.19
	Frost action	1.00				
	Shrink-swell	0.50				
	Depth to saturated zone	0.19				

TABLE 24.--SANITARY FACILITIES PART 1

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text on page 208 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
CeA:				
Celina	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00		
CeB:				
Celina	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	0.32
CeB2:				
Celina	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	0.32
CoA:				
Corwin	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53
CtA:				
Crosby	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53
Celina	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00		
CtB:				
Crosby	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53
			Slope	0.08
Celina	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	0.08

Table 24.--Sanitary Facilities Part 1--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
CvA:				
Crosby	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53
Lewisburg	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00		
CyA:				
Cyclone	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.46	Seepage	0.53
DaA:				
Dana	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Seepage	0.53
DaB:				
Dana	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Seepage	0.53
			Slope	0.32
EeA:				
Eel	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
	Restricted permeability	0.46		
EgA:				
Eldean	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.72		
EgB:				
Eldean	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.46	Slope	0.32

Table 24.--Sanitary Facilities Part 1--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
EgB2:				
Eldean	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.46	Slope	0.32
EhC3:				
Eldean	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Slope	0.04	Slope	1.00
EhD3:				
Eldean	Very limited		Very limited	
	Filtering capacity	1.00	Slope	1.00
	Slope	1.00	Seepage	1.00
	Restricted permeability	0.72		
EkA:				
Eldean	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.72		
EkB:				
Eldean	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.72	Slope	0.32
EkB2:				
Eldean	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.72	Slope	0.32
FcA:				
Fincastle	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53
FdA:				
Fincastle	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53
	Depth to bedrock	0.14		
FmA:				
Fox	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.46		

Table 24.--Sanitary Facilities Part 1--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
FmB:				
Fox	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.46	Slope	0.32
FmB2:				
Fox	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.46	Slope	0.32
HeF2:				
Hennepin	Very limited		Very limited	
	Restricted permeability	1.00	Slope	1.00
	Slope	1.00		
Miamian	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	1.00		
HwE2:				
Hennepin	Very limited		Very limited	
	Restricted permeability	1.00	Slope	1.00
	Slope	1.00		
Wynn	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to soft bedrock	1.00
	Slope	1.00	Slope	1.00
	Restricted permeability	1.00		
HwF2:				
Hennepin	Very limited		Very limited	
	Restricted permeability	1.00	Slope	1.00
	Slope	1.00		
Wynn	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to soft bedrock	1.00
	Slope	1.00	Slope	1.00
	Restricted permeability	1.00		
KeC2:				
Kendallville	Very limited		Very limited	
	Restricted permeability	1.00	Slope	1.00
	Slope	0.04	Seepage	0.53

Table 24.--Sanitary Facilities Part 1--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
Eldean	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.72	Slope	1.00
	Slope	0.04		
KeD2:				
Kendallville	Very limited		Very limited	
	Restricted permeability	1.00	Slope	1.00
	Slope	1.00	Seepage	0.53
Eldean	Very limited		Very limited	
	Filtering capacity	1.00	Slope	1.00
	Slope	1.00	Seepage	1.00
	Restricted permeability	0.72		
KnA:				
Kokomo	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Ponding	1.00
	Ponding	1.00		
KoA:				
Kokomo	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Ponding	1.00
	Ponding	1.00		
LeB:				
Lewisburg	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	0.32
			Seepage	0.28
Celina	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	0.32
LfB2:				
Lewisburg	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	0.32
			Seepage	0.28
Celina	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	0.32

Table 24.--Sanitary Facilities Part 1--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
LgC3:				
Lewisburg	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	0.04	Seepage	0.28
LpA:				
Lippincott	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Filtering capacity	1.00	Seepage	1.00
	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.46		
MaA:				
Medway	Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Flooding	1.00
	Restricted permeability	0.46	Seepage	1.00
MbB2:				
Miami	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53
			Slope	0.35
McE2:				
Miami	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	1.00	Seepage	0.53
Kendallville	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Restricted permeability	1.00	Seepage	0.53
McF2:				
Miami	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	1.00	Seepage	0.53
Kendallville	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Restricted permeability	1.00	Seepage	0.53

Table 24.--Sanitary Facilities Part 1--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
MdC2:				
Miami	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	0.04	Seepage	0.53
MdD2:				
Miami	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	1.00	Seepage	0.53
MeC:				
Miamian	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	0.04		
MeC2:				
Miamian	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	0.04		
MeD2:				
Miamian	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	1.00		
MfB:				
Miamian	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	0.32
Celina	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	0.32
MfB2:				
Miamian	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	0.32

Table 24.--Sanitary Facilities Part 1--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
Celina	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	0.32
MgE2:				
Miamian	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	1.00		
Kendallville	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Restricted permeability	1.00	Seepage	0.53
MgF2:				
Miamian	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	1.00		
Kendallville	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Restricted permeability	1.00	Seepage	0.53
MhC3:				
Miamian	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	0.04		
Losantville	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	0.04		
MhD3:				
Miamian	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	1.00		
Losantville	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	1.00		

Table 24.--Sanitary Facilities Part 1--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
MmE2:				
Miamian	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	1.00		
Hennepin	Very limited		Very limited	
	Restricted permeability	1.00	Slope	1.00
	Slope	1.00		
MnE3:				
Miamian	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	1.00		
Hennepin	Very limited		Very limited	
	Restricted permeability	1.00	Slope	1.00
	Slope	1.00		
MpA:				
Milford	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Ponding	1.00
	Ponding	1.00		
MrA:				
Milford	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Ponding	1.00
	Ponding	1.00	Seepage	0.53
MsA:				
Millsdale	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to hard bedrock	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Ponding	1.00
	Ponding	1.00		
MtA:				
Millsdale	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to hard bedrock	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Ponding	1.00
	Ponding	1.00		

Table 24.--Sanitary Facilities Part 1--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
MuA:				
Milton	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to hard bedrock	1.00
	Restricted permeability	0.72	Seepage	0.28
MuB:				
Milton	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to hard bedrock	1.00
	Restricted permeability	0.72	Slope	0.32
			Seepage	0.28
MuB2:				
Milton	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to hard bedrock	1.00
	Restricted permeability	0.72	Slope	0.32
			Seepage	0.28
MuC2:				
Milton	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to hard bedrock	1.00
	Restricted permeability	0.72	Slope	1.00
	Slope	0.04	Seepage	0.28
MuD2:				
Milton	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to hard bedrock	1.00
	Slope	1.00	Slope	1.00
	Restricted permeability	0.72	Seepage	0.28
MuE2:				
Milton	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to hard bedrock	1.00
	Slope	1.00	Slope	1.00
			Seepage	0.28
MwA:				
Morningsun	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	0.53
MxA:				
Morningsun	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	0.53

Table 24.--Sanitary Facilities Part 1--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
Xenia	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53
MxB:				
Morningsun	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	0.53
			Slope	0.32
Xenia	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53
			Slope	0.32
MxB2:				
Morningsun	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	0.53
			Slope	0.32
Xenia	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53
			Slope	0.32
MyA:				
Mahalasville	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Seepage	1.00
	Restricted permeability	0.46	Ponding	1.00
OcA:				
Ockley	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.46		
OcB:				
Ockley	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.46	Slope	0.32
Pg:				
Pits, Gravel	Not Rated		Not Rated	
Pq:				
Pits, Quarry	Not Rated		Not Rated	

Table 24.--Sanitary Facilities Part 1--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
PtB:				
Plattville	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to bedrock	0.59	Seepage	0.53
	Restricted permeability	0.46	Slope	0.32
			Depth to hard bedrock	0.13
RaA:				
Rainsville	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53
RaB:				
Rainsville	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53
			Slope	0.35
RaB2:				
Rainsville	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53
			Slope	0.35
RcA:				
Randolph	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to hard bedrock	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00		
RcB:				
Randolph	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to hard bedrock	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Slope	0.32
RnE2:				
Rodman	Very limited		Very limited	
	Filtering capacity	1.00	Slope	1.00
	Slope	1.00	Seepage	1.00
RnF2:				
Rodman	Very limited		Very limited	
	Filtering capacity	1.00	Slope	1.00
	Slope	1.00	Seepage	1.00

Table 24.--Sanitary Facilities Part 1--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
RoE2:				
Rodman	Very limited		Very limited	
	Filtering capacity	1.00	Slope	1.00
	Slope	1.00	Seepage	1.00
Kendallville	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Restricted permeability	1.00	Seepage	0.53
RoF2:				
Rodman	Very limited		Very limited	
	Filtering capacity	1.00	Slope	1.00
	Slope	1.00	Seepage	1.00
Kendallville	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Restricted permeability	1.00	Seepage	0.53
RpA:				
Rossburg	Very limited		Very limited	
	Flooding	1.00	Flooding	1.00
	Filtering capacity	1.00	Seepage	1.00
	Depth to saturated zone	0.65	Depth to saturated zone	0.02
	Restricted permeability	0.46		
RuB:				
Russell	Very limited		Somewhat limited	
	Restricted permeability	1.00	Seepage	0.53
	Depth to saturated zone	0.65	Slope	0.32
			Depth to saturated zone	0.02
Miamian	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	0.32
RuB2:				
Russell	Very limited		Somewhat limited	
	Restricted permeability	1.00	Seepage	0.53
	Depth to saturated zone	0.65	Slope	0.32
			Depth to saturated zone	0.02
Miamian	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	0.32

Table 24.--Sanitary Facilities Part 1--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
SeA:				
Savona	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.72		
SnA:				
Sloan	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
	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.72		
StA:				
Stonelick	Very limited		Very limited	
	Flooding	1.00	Flooding	1.00
	Filtering capacity	1.00	Seepage	1.00
SvA:				
Sugarvalley	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	0.53
SwA:				
Sugarvalley	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	0.53
Fincastle	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53
ThA:				
Thackery	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.46		
ThB:				
Thackery	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	0.53
			Slope	0.32

Table 24.--Sanitary Facilities Part 1--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
Ud:				
Udorthents	Not Rated		Not Rated	
W:				
Water	Not Rated		Not Rated	
WbA:				
Warsaw	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.46		
WnA:				
Westland	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Filtering capacity	1.00	Seepage	1.00
	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.46		
WyB:				
Wynn	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to soft bedrock	1.00
	Restricted permeability	1.00	Slope	0.32
WyB2:				
Wynn	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to soft bedrock	1.00
	Restricted permeability	1.00	Slope	0.32
WyC2:				
Wynn	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to soft bedrock	1.00
	Slope	0.04	Slope	1.00
WyD2:				
Wynn	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to soft bedrock	1.00
	Restricted permeability	1.00	Slope	1.00
	Slope	1.00		
XeA:				
Xenia	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53

Table 24.--Sanitary Facilities Part 1--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
XeB:				
Xenia	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53
			Slope	0.32
XeB2:				
Xenia	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53
			Slope	0.32
XfB:				
Xenia	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53
	Depth to bedrock	0.22	Slope	0.32

TABLE 25.--SANITARY FACILITIES PART 2

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text on page 208 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
CeA:						
Celina	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	0.44	Depth to saturated zone	0.68
					Too clayey	0.50
CeB:						
Celina	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	0.44	Depth to saturated zone	0.68
					Too clayey	0.50
CeB2:						
Celina	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	0.44	Depth to saturated zone	0.68
CoA:						
Corwin	Very limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.75	Depth to saturated zone	0.86
					Too clayey	0.50
CtA:						
Crosby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Celina	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	0.44	Depth to saturated zone	0.68
CtB:						
Crosby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Celina	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	0.44	Depth to saturated zone	0.68
					Too clayey	0.50
CvA:						
Crosby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Lewisburg	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
CyA:						
Cyclone	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Too clayey	0.50			Too clayey	0.50

Table 25.--Sanitary Facilities Part 2--Continued

Map symbol and soil name	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
DaA:						
Dana	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.68	Depth to saturated zone	0.04	Too clayey	0.50
	Too clayey	0.50			Depth to saturated zone	0.24
DaB:						
Dana	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.68	Depth to saturated zone	0.04	Too clayey	0.50
	Too clayey	0.50			Depth to saturated zone	0.24
EeA:						
Eel	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Seepage	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.95
	Seepage	1.00				
EgA:						
Eldean	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Carbonate content	1.00
	Too Sandy	0.50			Gravel content	0.97
					Too Sandy	0.50
EgB:						
Eldean	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Carbonate content	1.00
	Too Sandy	0.50			Gravel content	0.98
					Too Sandy	0.50
EgB2:						
Eldean	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Carbonate content	1.00
	Too Sandy	0.50			Gravel content	1.00
					Too Sandy	0.50
EhC3:						
Eldean	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Gravel content	1.00
	Too Sandy	0.50	Slope	0.04	Carbonate content	1.00
	Slope	0.04			Too Sandy	0.50
					Slope	0.04
EhD3:						
Eldean	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Carbonate content	1.00
	Slope	1.00	Slope	1.00	Slope	1.00
					Gravel content	0.92
EkA:						
Eldean	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Carbonate content	1.00
					Gravel content	0.81
EkB:						
Eldean	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Carbonate content	1.00
					Gravel content	0.73

Table 25.--Sanitary Facilities Part 2--Continued

Map symbol and soil name	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
EkB2:						
Eldean	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Carbonate content	1.00
					Gravel content	0.92
FcA:						
Fincastle	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
FdA:						
Fincastle	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to bedrock	1.00			Too clayey	0.50
	Too clayey	0.50				
FmA:						
Fox	Somewhat limited		Very limited		Very limited	
	Too clayey	0.50	Seepage	1.00	Seepage	1.00
	Too Sandy	0.50			Too clayey	0.50
					Too Sandy	0.50
FmB:						
Fox	Somewhat limited		Very limited		Very limited	
	Too Sandy	0.50	Seepage	1.00	Seepage	1.00
					Too Sandy	0.50
					Too clayey	0.50
FmB2:						
Fox	Somewhat limited		Very limited		Very limited	
	Too Sandy	0.50	Seepage	1.00	Seepage	1.00
					Too Sandy	0.50
					Too clayey	0.50
					Gravel content	0.01
HeF2:						
Hennepin	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Depth to saturated zone	0.44			Depth to saturated zone	0.09
HwE2:						
Hennepin	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
Wynn	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Depth to bedrock	1.00
	Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
	Too clayey	0.50			Hard to compact	1.00
					Too clayey	0.50
HwF2:						
Hennepin	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00

Table 25.--Sanitary Facilities Part 2--Continued

Map symbol and soil name	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
Wynn	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Depth to bedrock	1.00
	Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
	Too clayey	0.50			Hard to compact	1.00
					Too clayey	0.50
KeC2:						
Kendallville	Somewhat limited		Somewhat limited		Somewhat limited	
	Slope	0.04	Slope	0.04	Slope	0.04
Eldean	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Carbonate content	1.00
	Too Sandy	0.50	Slope	0.04	Gravel content	0.90
	Slope	0.04			Too Sandy	0.50
					Slope	0.04
KeD2:						
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
Eldean	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Carbonate content	1.00
	Slope	1.00	Slope	1.00	Slope	1.00
	Too Sandy	0.50			Gravel content	0.71
					Too Sandy	0.50
KnA:						
Kokomo	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Hard to compact	1.00
	Too clayey	0.50			Ponding	1.00
					Too clayey	0.50
KoA:						
Kokomo	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Hard to compact	1.00
	Too clayey	0.50			Ponding	1.00
					Too clayey	0.50
LeB:						
Lewisburg	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Celina	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	0.44	Depth to saturated zone	0.68
LfB2:						
Lewisburg	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Celina	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	0.44	Depth to saturated zone	0.68

Table 25.--Sanitary Facilities Part 2--Continued

Map symbol and soil name	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
LgC3:						
Lewisburg	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Slope	0.04	Slope	0.04	Slope	0.04
LpA:						
Lippincott	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	Carbonate content	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Too Sandy	0.50			Gravel content	0.79
					Too Sandy	0.50
MaA:						
Medway	Very limited		Very limited		Somewhat limited	
	Flooding	1.00	Flooding	1.00	Depth to saturated zone	0.24
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
	Seepage	1.00	Seepage	1.00		
MbB2:						
Miami	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.68	Depth to saturated zone	0.04	Depth to saturated zone	0.24
McE2:						
Miami	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Depth to saturated zone	0.68	Depth to saturated zone	0.04	Depth to saturated zone	0.24
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
McF2:						
Miami	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Depth to saturated zone	0.68	Depth to saturated zone	0.04	Depth to saturated zone	0.24
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
					Too clayey	0.50
MdC2:						
Miami	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.68	Slope	0.04	Depth to saturated zone	0.24
	Slope	0.04	Depth to saturated zone	0.04	Slope	0.04
MdD2:						
Miami	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Depth to saturated zone	0.68	Depth to saturated zone	0.04	Depth to saturated zone	0.24

Table 25.--Sanitary Facilities Part 2--Continued

Map symbol and soil name	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
MeC:						
Miamian	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Slope	0.04	Depth to saturated zone	0.09
	Slope	0.04			Slope	0.04
MeC2:						
Miamian	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Slope	0.04	Depth to saturated zone	0.09
	Slope	0.04			Slope	0.04
MeD2:						
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Depth to saturated zone	0.44			Depth to saturated zone	0.09
MfB:						
Miamian	Somewhat limited		Not limited		Somewhat limited	
	Depth to saturated zone	0.44			Depth to saturated zone	0.09
Celina	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	0.44	Depth to saturated zone	0.68
MfB2:						
Miamian	Somewhat limited		Not limited		Somewhat limited	
	Depth to saturated zone	0.44			Depth to saturated zone	0.09
Celina	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	0.44	Depth to saturated zone	0.68
MgE2:						
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Depth to saturated zone	0.44			Depth to saturated zone	0.09
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
MgF2:						
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Depth to saturated zone	0.44			Depth to saturated zone	0.09
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
					Too clayey	0.50
MhC3:						
Miamian	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Slope	0.04	Depth to saturated zone	0.09
	Slope	0.04			Slope	0.04

Table 25.--Sanitary Facilities Part 2--Continued

Map symbol and soil name	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Losantville	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Slope	0.04	Slope	0.04	Slope	0.04
MhD3:						
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Depth to saturated zone	0.44			Depth to saturated zone	0.09
Losantville	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope	1.00
	Slope	1.00	Slope	1.00	Depth to saturated zone	1.00
MmE2:						
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Depth to saturated zone	0.44			Depth to saturated zone	0.09
Hennepin	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
MnE3:						
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Depth to saturated zone	0.44			Depth to saturated zone	0.09
Hennepin	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
MpA:						
Milford	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Too clayey	1.00
					Ponding	1.00
MrA:						
Milford	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	Ponding	1.00	Ponding	1.00
	Ponding	1.00			Too clayey	0.50
MsA:						
Millsdale	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to bedrock	1.00
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to saturated zone	1.00
	Too clayey	1.00	Ponding	1.00	Too clayey	1.00
	Ponding	1.00			Hard to compact	1.00
					Ponding	1.00

Table 25.--Sanitary Facilities Part 2--Continued

Map symbol and soil name	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
MtA:						
Millsdale	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to bedrock	1.00
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to saturated zone	1.00
	Too clayey	1.00	Ponding	1.00	Too clayey	1.00
	Ponding	1.00			Hard to compact	1.00
					Ponding	1.00
MuA:						
Milton	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
	Too clayey	0.50			Too clayey	0.50
MuB:						
Milton	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
	Too clayey	0.50			Too clayey	0.50
MuB2:						
Milton	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
	Too clayey	0.50			Too clayey	0.50
MuC2:						
Milton	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
	Too clayey	0.50	Slope	0.04	Too clayey	0.50
	Slope	0.04			Slope	0.04
MuD2:						
Milton	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
	Slope	1.00	Slope	1.00	Slope	1.00
	Too clayey	0.50			Too clayey	0.50
MuE2:						
Milton	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Depth to bedrock	1.00
	Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
	Too clayey	1.00			Too clayey	1.00
MwA:						
Morningsun	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.24
MxA:						
Morningsun	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
	Too clayey	0.50			Depth to saturated zone	0.24
Xenia	Very limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.75	Depth to saturated zone	0.86
					Too clayey	0.50

Table 25.--Sanitary Facilities Part 2--Continued

Map symbol and soil name	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MxB:						
Morningsun	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
	Too clayey	0.50			Depth to saturated zone	0.24
Xenia	Very limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.75	Depth to saturated zone	0.86
					Too clayey	0.50
MxB2:						
Morningsun	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too Sandy	0.50
	Too Sandy	0.50			Depth to saturated zone	0.24
Xenia	Very limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.75	Depth to saturated zone	0.86
					Too clayey	0.50
MyA:						
Mahalasville	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	Ponding	1.00	Ponding	1.00
	Ponding	1.00			Too clayey	0.50
	Too clayey	0.50				
OcA:						
Ockley	Very limited		Not limited		Somewhat limited	
	Seepage	1.00			Too clayey	0.50
	Too clayey	0.50			Gravel content	0.13
OcB:						
Ockley	Very limited		Not limited		Somewhat limited	
	Seepage	1.00			Too clayey	0.50
	Too clayey	0.50			Gravel content	0.09
Pg:						
Pits, Gravel	Not Rated		Not Rated		Not Rated	
Pq:						
Pits, Quarry	Not Rated		Not Rated		Not Rated	
PtB:						
Plattville	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
	Depth to bedrock	1.00	Depth to bedrock	0.14	Depth to bedrock	0.14
	Too clayey	0.50			Depth to saturated zone	0.09
RaA:						
Rainsville	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.86	Depth to saturated zone	0.19	Too clayey	0.50
	Too clayey	0.50			Depth to saturated zone	0.47

Table 25.--Sanitary Facilities Part 2--Continued

Map symbol and soil name	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
RaB:						
Rainsville	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.86	Depth to saturated zone	0.19	Too clayey	0.50
	Too clayey	0.50			Depth to saturated zone	0.47
RaB2:						
Rainsville	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.86	Depth to saturated zone	0.19	Too clayey	0.50
	Too clayey	0.50			Depth to saturated zone	0.47
RcA:						
Randolph	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to bedrock	1.00
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to saturated zone	1.00
	Too clayey	1.00			Too clayey	1.00
					Hard to compact	1.00
RcB:						
Randolph	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to bedrock	1.00
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to saturated zone	1.00
	Too clayey	1.00			Too clayey	1.00
					Hard to compact	1.00
RnE2:						
Rodman	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Seepage	1.00	Seepage	1.00	Seepage	1.00
	Too Sandy	0.50			Gravel content	1.00
					Too Sandy	0.50
RnF2:						
Rodman	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Seepage	1.00	Seepage	1.00	Seepage	1.00
	Too Sandy	0.50			Gravel content	1.00
					Too Sandy	0.50
RoE2:						
Rodman	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Seepage	1.00	Seepage	1.00	Seepage	1.00
	Too Sandy	0.50			Gravel content	1.00
					Too Sandy	0.50
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Too clayey	0.50			Too clayey	0.50
RoF2:						
Rodman	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Seepage	1.00	Seepage	1.00	Seepage	1.00
	Too Sandy	0.50			Gravel content	1.00
					Too Sandy	0.50

Table 25.--Sanitary Facilities Part 2--Continued

Map symbol and soil name	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
					Too clayey	0.50
RpA:						
Rossburg	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Too Sandy	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	1.00				
RuB:						
Russell	Somewhat limited		Not limited		Somewhat limited	
	Too clayey	0.50			Too clayey	0.50
Miamian	Somewhat limited		Not limited		Somewhat limited	
	Depth to saturated zone	0.44			Depth to saturated zone	0.09
RuB2:						
Russell	Somewhat limited		Not limited		Somewhat limited	
	Too clayey	0.50			Too clayey	0.50
Miamian	Somewhat limited		Not limited		Somewhat limited	
	Depth to saturated zone	0.44			Depth to saturated zone	0.09
SeA:						
Savona	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			Too Sandy	1.00
	Too Sandy	1.00			Seepage	1.00
					Carbonate content	1.00
					Too clayey	0.50
SnA:						
Sloan	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Seepage	1.00	Ponding	1.00	Too clayey	0.50
	Ponding	1.00				
	Too clayey	0.50				
StA:						
Stonelick	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Seepage	1.00
	Seepage	1.00	Seepage	1.00	Gravel content	0.63
	Too Sandy	0.50			Too Sandy	0.50
SvA:						
Sugarvalley	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
SwA:						
Sugarvalley	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

Table 25.--Sanitary Facilities Part 2--Continued

Map symbol and soil name	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
Fincastle	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
ThA:						
Thackery	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.96
	Seepage	1.00			Too clayey	0.50
	Too clayey	0.50				
ThB:						
Thackery	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
	Seepage	1.00			Depth to saturated zone	0.09
	Too clayey	0.50				
Ud:						
Udorthents	Not Rated		Not Rated		Not Rated	
W:						
Water	Not Rated		Not Rated		Not Rated	
WbA:						
Warsaw	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too Sandy	1.00
	Too Sandy	1.00			Seepage	1.00
					Gravel content	0.68
WnA:						
Westland	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	Ponding	1.00	Ponding	1.00
	Ponding	1.00			Too clayey	0.50
	Too clayey	0.50			Gravel content	0.01
WyB:						
Wynn	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
	Too clayey	0.50			Hard to compact	1.00
					Too clayey	0.50
WyB2:						
Wynn	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
	Too clayey	0.50			Hard to compact	1.00
					Too clayey	0.50
WyC2:						
Wynn	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
	Too clayey	0.50	Slope	0.04	Hard to compact	1.00
	Slope	0.04			Too clayey	0.50
					Slope	0.04

Table 25.--Sanitary Facilities Part 2--Continued

Map symbol and soil name	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WyD2:						
Wynn	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
	Slope	1.00	Slope	1.00	Hard to compact	1.00
	Too clayey	0.50			Slope	1.00
					Too clayey	0.50
XeA:						
Xenia	Very limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.75	Depth to saturated zone	0.86
	Too clayey	0.50			Too clayey	0.50
XeB:						
Xenia	Very limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.75	Depth to saturated zone	0.86
	Too clayey	0.50			Too clayey	0.50
XeB2:						
Xenia	Very limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.75	Depth to saturated zone	0.86
					Too clayey	0.50
XfB:						
Xenia	Very limited		Somewhat limited		Somewhat limited	
	Depth to bedrock	1.00	Depth to saturated zone	0.75	Depth to saturated zone	0.86
	Depth to saturated zone	1.00			Too clayey	0.50
	Too clayey	0.50				

TABLE 26.--AGRICULTURAL WASTE MANAGEMENT

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text on page 210 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
CeA:						
Celina	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.95	Depth to saturated zone	0.95	Depth to saturated zone	0.95
	Shallow to densic materials	0.06	Shallow to densic materials	0.06		
CeB:						
Celina	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.95	Depth to saturated zone	0.95	Depth to saturated zone	0.95
	Shallow to densic materials	0.01	Shallow to densic materials	0.01	Too steep for surface application	0.08
CeB2:						
Celina	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.95	Depth to saturated zone	0.95	Depth to saturated zone	0.95
	Shallow to densic materials	0.64	Shallow to densic materials	0.64	Too steep for surface application	0.08
CoA:						
Corwin	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too acid	0.02	Too acid	0.07	Too acid	0.07
	Shallow to densic materials	0.01	Shallow to densic materials	0.01		
CtA:						
Crosby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Too acid	0.02	Too acid	0.07	Too acid	0.07
	Shallow to densic materials	0.01	Shallow to densic materials	0.01		
Celina	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.95	Depth to saturated zone	0.95	Depth to saturated zone	0.95
	Shallow to densic materials	0.15	Shallow to densic materials	0.15		

Table 26.--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
CtB:						
Crosby	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
	Shallow to densic materials	0.29	Shallow to densic materials	0.29	Droughty	0.13
	Droughty	0.13	Droughty	0.13	Too acid	0.07
	Too acid	0.02	Too acid	0.07		
Celina	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.95	Depth to saturated zone	0.95	Depth to saturated zone	0.95
	Shallow to densic materials	0.01	Shallow to densic materials	0.01		
CvA:						
Crosby	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
	Shallow to densic materials	0.06	Too acid	0.07	Too acid	0.07
	Too acid	0.02	Shallow to densic materials	0.06	Droughty	0.01
	Droughty	0.01	Droughty	0.01		
Lewisburg	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Dense layer	1.00	Shallow to densic materials	1.00	Restricted permeability	1.00
	Shallow to densic materials	1.00	Restricted permeability	1.00		
	Restricted permeability	1.00				
CyA:						
Cyclone	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.41	Restricted permeability	0.31	Restricted permeability	0.31
DaA:						
Dana	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.74	Depth to saturated zone	0.68	Depth to saturated zone	0.68
	Depth to saturated zone	0.68	Restricted permeability	0.60	Restricted permeability	0.60

Table 26.--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
DaB:						
Dana	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.74	Depth to saturated zone	0.68	Depth to saturated zone	0.68
	Depth to saturated zone	0.68	Restricted permeability	0.60	Restricted permeability	0.60
					Too steep for surface application	0.08
EeA:						
Eel	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Flooding	1.00	Flooding	1.00	Flooding	0.60
	Leaching limitation	0.45				
EgA:						
Eldean	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Droughty	0.50	Droughty	0.50	Droughty	0.50
	Shallow to Discontinuity	0.46	Shallow to Discontinuity	0.46		
EgB:						
Eldean	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Droughty	0.50	Droughty	0.50	Droughty	0.50
	Shallow to Discontinuity	0.46	Shallow to Discontinuity	0.46	Too steep for surface application	0.08
EgB2:						
Eldean	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Shallow to Discontinuity	0.79	Shallow to Discontinuity	0.79	Droughty	0.69
	Droughty	0.69	Droughty	0.69	Too steep for surface application	0.08
EhC3:						
Eldean	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Dense layer	1.00	Shallow to Discontinuity	0.97	Too steep for surface application	1.00
	Shallow to Discontinuity	0.97	Droughty	0.81	Droughty	0.81
	Droughty	0.81	Slope	0.04	Too steep for sprinkler application	0.22
	Slope	0.04				

Table 26.--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
EhD3:						
Eldean	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Droughty	0.23	Droughty	0.23	Too steep for sprinkler application	1.00
	Shallow to Discontinuity	0.10	Shallow to Discontinuity	0.10	Droughty	0.23
EkA:						
Eldean	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Shallow to Discontinuity	0.06	Shallow to Discontinuity	0.06	Droughty	0.04
	Droughty	0.04	Droughty	0.04		
EkB:						
Eldean	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Shallow to Discontinuity	0.15	Shallow to Discontinuity	0.15	Droughty	0.13
	Droughty	0.13	Droughty	0.13	Too steep for surface application	0.08
EkB2:						
Eldean	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Shallow to Discontinuity	0.29	Shallow to Discontinuity	0.29	Droughty	0.28
	Droughty	0.28	Droughty	0.28	Too steep for surface application	0.08
FcA:						
Fincastle	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Too acid	0.02	Too acid	0.07	Too acid	0.07
FdA:						
Fincastle	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Low adsorption	1.00	Restricted permeability	1.00
	Too acid	0.02	Restricted permeability	1.00	Too acid	0.07
			Too acid	0.07		

Table 26.--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
FmA:						
Fox	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Shallow to Discontinuity	0.03	Too acid	0.07	Too acid	0.07
	Too acid	0.02	Shallow to Discontinuity	0.03		
FmB:						
Fox	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Shallow to Discontinuity	0.03	Too acid	0.07	Too steep for surface application	0.08
	Too acid	0.02	Shallow to Discontinuity	0.03	Too acid	0.07
FmB2:						
Fox	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Too acid	0.02	Too acid	0.07	Too steep for surface application	0.08
	Shallow to Discontinuity	0.01	Shallow to Discontinuity	0.01	Too acid	0.07
HeF2:						
Hennepin	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Dense layer	1.00	Shallow to densic materials	1.00	Too steep for sprinkler application	1.00
	Shallow to densic materials	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Restricted permeability	1.00				
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Too steep for sprinkler application	1.00
	Shallow to densic materials	0.54	Shallow to densic materials	0.54	Restricted permeability	1.00
	Depth to saturated zone	0.43	Depth to saturated zone	0.43	Depth to saturated zone	0.43

Table 26.--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
HwE2:						
Hennepin	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Dense layer	1.00	Shallow to densic materials	1.00	Too steep for sprinkler application	1.00
	Shallow to densic materials	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Restricted permeability	1.00				
Wynn	Very limited		Very limited		Very limited	
	Slope	1.00	Low adsorption	1.00	Too steep for surface application	1.00
	Depth to bedrock	0.46	Slope	1.00	Too steep for sprinkler application	1.00
	Restricted permeability	0.41	Depth to bedrock	0.46	Depth to bedrock	0.46
	Too acid	0.02	Restricted permeability	0.31	Restricted permeability	0.31
	Droughty	0.02	Too acid	0.07	Too acid	0.07
HwF2:						
Hennepin	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Dense layer	1.00	Shallow to densic materials	1.00	Too steep for sprinkler application	1.00
	Shallow to densic materials	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Restricted permeability	1.00				
Wynn	Very limited		Very limited		Very limited	
	Slope	1.00	Low adsorption	1.00	Too steep for surface application	1.00
	Depth to bedrock	0.90	Slope	1.00	Too steep for sprinkler application	1.00
	Droughty	0.44	Depth to bedrock	0.90	Depth to bedrock	0.90
	Restricted permeability	0.41	Droughty	0.44	Droughty	0.44
	Too acid	0.02	Restricted permeability	0.31	Restricted permeability	0.31
KeC2:						
Kendallville	Somewhat limited		Somewhat limited		Very limited	
	Shallow to densic materials	0.46	Shallow to densic materials	0.46	Too steep for surface application	1.00
	Restricted permeability	0.41	Restricted permeability	0.31	Restricted permeability	0.31
	Slope	0.04	Slope	0.04	Too steep for sprinkler application	0.22

Table 26.--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
Eldean	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Shallow to Discontinuity	0.79	Shallow to Discontinuity	0.79	Too steep for surface application	1.00
	Droughty	0.56	Droughty	0.56	Droughty	0.56
	Slope	0.04	Slope	0.04	Too steep for sprinkler application	0.22
KeD2:						
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Restricted permeability	0.41	Restricted permeability	0.31	Too steep for sprinkler application	1.00
	Shallow to densic materials	0.29	Shallow to densic materials	0.29	Restricted permeability	0.31
Eldean	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Droughty	0.28	Droughty	0.28	Too steep for sprinkler application	1.00
	Shallow to Discontinuity	0.20	Shallow to Discontinuity	0.20	Droughty	0.28
KnA:						
Kokomo	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Too acid	0.02	Too acid	0.07	Too acid	0.07
KoA:						
Kokomo	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Too acid	0.02	Too acid	0.07	Too acid	0.07
LeB:						
Lewisburg	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Dense layer	1.00	Shallow to densic materials	1.00	Restricted permeability	1.00
	Shallow to densic materials	1.00	Restricted permeability	1.00	Too steep for surface application	0.08
	Restricted permeability	1.00				

Table 26.--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
Celina	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.95	Depth to saturated zone	0.95	Depth to saturated zone	0.95
	Shallow to densic materials	0.15	Shallow to densic materials	0.15	Too steep for surface application	0.08
LfB2:						
Lewisburg	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Dense layer	1.00	Shallow to densic materials	1.00	Restricted permeability	1.00
	Shallow to densic materials	1.00	Restricted permeability	1.00	Too steep for surface application	0.08
	Restricted permeability	1.00				
Celina	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.95	Depth to saturated zone	0.95	Depth to saturated zone	0.95
	Shallow to densic materials	0.46	Shallow to densic materials	0.46	Too steep for surface application	0.08
LgC3:						
Lewisburg	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Dense layer	1.00	Shallow to densic materials	1.00	Restricted permeability	1.00
	Shallow to densic materials	1.00	Restricted permeability	1.00	Too steep for surface application	1.00
	Restricted permeability	1.00	Slope	0.04	Too steep for sprinkler application	0.22
	Slope	0.04				
LpA:						
Lippincott	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Shallow to Discontinuity	0.06	Shallow to Discontinuity	0.06	Droughty	0.01
	Droughty	0.01	Droughty	0.01		
MaA:						
Medway	Very limited		Very limited		Somewhat limited	
	Flooding	1.00	Flooding	1.00	Depth to saturated zone	0.68
	Depth to saturated zone	0.68	Depth to saturated zone	0.68	Flooding	0.60

Table 26.--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
MbB2:						
Miami	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Dense layer	1.00	Depth to saturated zone	0.68	Depth to saturated zone	0.68
	Depth to saturated zone	0.68	Shallow to densic materials	0.46	Droughty	0.17
	Shallow to densic materials	0.46	Droughty	0.17	Too steep for surface application	0.10
	Droughty	0.17				
McE2:						
Miami	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Too steep for sprinkler application	1.00
	Dense layer	1.00	Depth to saturated zone	0.68	Restricted permeability	1.00
	Depth to saturated zone	0.68	Shallow to densic materials	0.35	Depth to saturated zone	0.68
	Shallow to densic materials	0.35	Droughty	0.13	Droughty	0.13
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Restricted permeability	0.41	Shallow to densic materials	0.35	Too steep for sprinkler application	1.00
	Shallow to densic materials	0.35	Restricted permeability	0.31	Restricted permeability	0.31
McF2:						
Miami	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Too steep for sprinkler application	1.00
	Dense layer	1.00	Depth to saturated zone	0.68	Restricted permeability	1.00
	Depth to saturated zone	0.68	Shallow to densic materials	0.64	Depth to saturated zone	0.68
	Shallow to densic materials	0.64	Droughty	0.19	Droughty	0.19
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Restricted permeability	0.41	Restricted permeability	0.31	Too steep for sprinkler application	1.00
					Restricted permeability	0.31

Table 26.--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
MdC2:						
Miami	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Dense layer	1.00	Shallow to densic materials	0.79	Too steep for surface application	1.00
	Shallow to densic materials	0.79	Depth to saturated zone	0.68	Depth to saturated zone	0.68
	Depth to saturated zone	0.68	Droughty	0.39	Droughty	0.39
	Droughty	0.39	Slope	0.04	Too steep for sprinkler application	0.22
MdD2:						
Miami	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Too steep for surface application	1.00
	Slope	1.00	Slope	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.68	Depth to saturated zone	0.68	Too steep for sprinkler application	1.00
	Shallow to densic materials	0.46	Shallow to densic materials	0.46	Depth to saturated zone	0.68
	Droughty	0.16	Droughty	0.16	Droughty	0.16
MeC:						
Miamian	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Shallow to densic materials	0.90	Shallow to densic materials	0.90	Too steep for surface application	1.00
	Depth to saturated zone	0.43	Depth to saturated zone	0.43	Depth to saturated zone	0.43
	Slope	0.04	Slope	0.04	Too steep for sprinkler application	0.22
MeC2:						
Miamian	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Shallow to densic materials	0.54	Shallow to densic materials	0.54	Too steep for surface application	1.00
	Depth to saturated zone	0.43	Depth to saturated zone	0.43	Depth to saturated zone	0.43
	Slope	0.04	Slope	0.04	Too steep for sprinkler application	0.22

Table 26.--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
MeD2:						
Miamian	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Too steep for surface application	1.00
	Slope	1.00	Slope	1.00	Restricted permeability	1.00
	Shallow to densic materials	0.71	Shallow to densic materials	0.71	Too steep for sprinkler application	1.00
	Depth to saturated zone	0.43	Depth to saturated zone	0.43	Depth to saturated zone	0.43
MfB:						
Miamian	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.43	Depth to saturated zone	0.43	Depth to saturated zone	0.43
	Shallow to densic materials	0.10	Shallow to densic materials	0.10	Too steep for surface application	0.08
Celina	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.95	Depth to saturated zone	0.95	Depth to saturated zone	0.95
	Shallow to densic materials	0.15	Shallow to densic materials	0.15	Too steep for surface application	0.08
MfB2:						
Miamian	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.43	Depth to saturated zone	0.43	Depth to saturated zone	0.43
	Shallow to densic materials	0.06	Shallow to densic materials	0.06	Too steep for surface application	0.08
Celina	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.95	Depth to saturated zone	0.95	Depth to saturated zone	0.95
	Shallow to densic materials	0.20	Shallow to densic materials	0.20	Too steep for surface application	0.08
MgE2:						
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Too steep for sprinkler application	1.00
	Depth to saturated zone	0.43	Depth to saturated zone	0.43	Restricted permeability	1.00
	Shallow to densic materials	0.01	Shallow to densic materials	0.01	Depth to saturated zone	0.43

Table 26.--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
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Shallow to densic materials	0.54	Shallow to densic materials	0.54	Too steep for sprinkler application	1.00
	Restricted permeability	0.41	Restricted permeability	0.31	Restricted permeability	0.31
MgF2:						
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Too steep for sprinkler application	1.00
	Shallow to densic materials	0.64	Shallow to densic materials	0.64	Restricted permeability	1.00
	Depth to saturated zone	0.43	Depth to saturated zone	0.43	Depth to saturated zone	0.43
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Restricted permeability	0.41	Restricted permeability	0.31	Too steep for sprinkler application	1.00
	Shallow to densic materials	0.10	Shallow to densic materials	0.10	Restricted permeability	0.31
MhC3:						
Miamian	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Shallow to densic materials	0.79	Shallow to densic materials	0.79	Too steep for surface application	1.00
	Depth to saturated zone	0.43	Depth to saturated zone	0.43	Depth to saturated zone	0.43
	Slope	0.04	Slope	0.04	Too steep for sprinkler application	0.22
Losantville	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Dense layer	1.00	Shallow to densic materials	1.00	Restricted permeability	1.00
	Shallow to densic materials	1.00	Restricted permeability	1.00	Too steep for surface application	1.00
	Restricted permeability	1.00	Droughty	0.90	Droughty	0.90
	Droughty	0.90	Slope	0.04	Too steep for sprinkler application	0.22

Table 26.--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
MhD3:						
Miamian	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Too steep for surface application	1.00
	Slope	1.00	Slope	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.43	Depth to saturated zone	0.43	Too steep for sprinkler application	1.00
	Shallow to densic materials	0.20	Shallow to densic materials	0.20	Depth to saturated zone	0.43
Losantville	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Dense layer	1.00	Shallow to densic materials	1.00	Too steep for surface application	1.00
	Shallow to densic materials	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Restricted permeability	1.00	Slope	1.00	Too steep for sprinkler application	1.00
	Slope	1.00	Droughty	0.98	Droughty	0.98
MmE2:						
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Too steep for sprinkler application	1.00
	Shallow to densic materials	0.79	Shallow to densic materials	0.79	Restricted permeability	1.00
	Depth to saturated zone	0.43	Depth to saturated zone	0.43	Depth to saturated zone	0.43
Hennepin	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Dense layer	1.00	Shallow to densic materials	1.00	Too steep for sprinkler application	1.00
	Shallow to densic materials	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Restricted permeability	1.00				
MnE3:						
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Too steep for sprinkler application	1.00
	Shallow to densic materials	0.79	Shallow to densic materials	0.79	Restricted permeability	1.00
	Depth to saturated zone	0.43	Depth to saturated zone	0.43	Depth to saturated zone	0.43

Table 26.--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
Hennepin	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Dense layer	1.00	Shallow to densic materials	1.00	Too steep for sprinkler application	1.00
	Shallow to densic materials	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Restricted permeability	1.00				
MpA:						
Milford	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.41	Restricted permeability	0.31	Restricted permeability	0.31
MrA:						
Milford	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.41	Restricted permeability	0.31	Restricted permeability	0.31
MsA:						
Millsdale	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Low adsorption	1.00	Ponding	1.00
	Depth to bedrock	0.84	Ponding	1.00	Depth to bedrock	0.84
	Leaching limitation	0.70	Depth to bedrock	0.84	Droughty	0.46
	Droughty	0.46	Droughty	0.46	Restricted permeability	0.31
MtA:						
Millsdale	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Low adsorption	1.00	Ponding	1.00
	Leaching limitation	0.70	Ponding	1.00	Depth to bedrock	0.46
	Depth to bedrock	0.46	Depth to bedrock	0.46	Restricted permeability	0.31
	Restricted permeability	0.41	Restricted permeability	0.31	Droughty	0.17
MuA:						
Milton	Somewhat limited		Very limited		Somewhat limited	
	Depth to bedrock	0.35	Low adsorption	1.00	Depth to bedrock	0.35
	Droughty	0.11	Depth to bedrock	0.35	Droughty	0.11
	Too acid	0.02	Droughty	0.11	Too acid	0.07
			Too acid	0.07		

Table 26.--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
MuB:						
Milton	Somewhat limited		Very limited		Somewhat limited	
	Depth to bedrock	0.65	Low adsorption	1.00	Depth to bedrock	0.65
	Droughty	0.31	Depth to bedrock	0.65	Droughty	0.31
	Too acid	0.02	Droughty	0.31	Too steep for surface application	0.08
			Too acid	0.07	Too acid	0.07
MuB2:						
Milton	Somewhat limited		Very limited		Somewhat limited	
	Depth to bedrock	0.65	Low adsorption	1.00	Depth to bedrock	0.65
	Droughty	0.48	Depth to bedrock	0.65	Droughty	0.48
	Too acid	0.02	Droughty	0.48	Too steep for surface application	0.08
			Too acid	0.07	Too acid	0.07
MuC2:						
Milton	Somewhat limited		Very limited		Very limited	
	Depth to bedrock	0.65	Low adsorption	1.00	Too steep for surface application	1.00
	Droughty	0.55	Depth to bedrock	0.65	Depth to bedrock	0.65
	Slope	0.04	Droughty	0.55	Droughty	0.55
	Too acid	0.02	Too acid	0.07	Too steep for sprinkler application	0.22
			Slope	0.04	Too acid	0.07
MuD2:						
Milton	Very limited		Very limited		Very limited	
	Slope	1.00	Low adsorption	1.00	Too steep for surface application	1.00
	Depth to bedrock	0.54	Slope	1.00	Too steep for sprinkler application	1.00
	Droughty	0.37	Depth to bedrock	0.54	Depth to bedrock	0.54
	Too acid	0.02	Droughty	0.37	Droughty	0.37
			Too acid	0.07	Too acid	0.07
MuE2:						
Milton	Very limited		Very limited		Very limited	
	Slope	1.00	Low adsorption	1.00	Too steep for surface application	1.00
	Depth to bedrock	0.95	Slope	1.00	Too steep for sprinkler application	1.00
	Droughty	0.91	Depth to bedrock	0.95	Depth to bedrock	0.95
	Too acid	0.02	Droughty	0.91	Droughty	0.91
			Too acid	0.07	Too acid	0.07
MwA:						
Morningsun	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.68	Depth to saturated zone	0.68	Depth to saturated zone	0.68
MxA:						
Morningsun	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.68	Depth to saturated zone	0.68	Depth to saturated zone	0.68

Table 26.--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
Xenia	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
MxB:						
Morningsun	Somewhat limited Depth to saturated zone	0.68	Somewhat limited Depth to saturated zone	0.68	Somewhat limited Depth to saturated zone	0.68
					Too steep for surface application	0.08
Xenia	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00	Very limited 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	0.08
MxB2:						
Morningsun	Somewhat limited Depth to saturated zone	0.68	Somewhat limited Depth to saturated zone	0.68	Somewhat limited Depth to saturated zone	0.68
					Too steep for surface application	0.08
Xenia	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00	Very limited 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	0.08
MyA:						
Mahalasville	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Filtering capacity	0.01	Filtering capacity	0.01	Filtering capacity	0.01
OcA:						
Ockley	Very limited Filtering capacity	1.00	Very limited Filtering capacity	1.00	Very limited Filtering capacity	1.00
	Droughty	0.01	Droughty	0.01	Droughty	0.01
OcB:						
Ockley	Very limited Filtering capacity	1.00	Very limited Filtering capacity	1.00	Very limited Filtering capacity	1.00
					Too steep for surface application	0.08

Table 26.--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
Pg:						
Pits, Gravel	Not rated		Not rated		Not rated	
Pq:						
Pits, Quarry	Not rated		Not rated		Not rated	
PtB:						
Plattville	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.43	Low adsorption	1.00	Depth to saturated zone	0.43
			Depth to saturated zone	0.43	Too steep for surface application	0.08
RaA:						
Rainsville	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.86	Depth to saturated zone	0.86	Depth to saturated zone	0.86
	Too acid	0.02	Too acid	0.07	Too acid	0.07
RaB:						
Rainsville	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.86	Depth to saturated zone	0.86	Depth to saturated zone	0.86
	Too acid	0.02	Too acid	0.07	Too steep for surface application	0.10
					Too acid	0.07
RaB2:						
Rainsville	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.86	Depth to saturated zone	0.86	Depth to saturated zone	0.86
	Too acid	0.02	Too acid	0.07	Too steep for surface application	0.10
					Too acid	0.07
RcA:						
Randolph	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	0.41	Low adsorption	1.00	Too acid	0.31
	Depth to bedrock	0.20	Too acid	0.31	Restricted permeability	0.31
	Droughty	0.17	Restricted permeability	0.31	Depth to bedrock	0.20
	Too acid	0.08	Depth to bedrock	0.20	Droughty	0.17

Table 26.--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
RcB:						
Randolph	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Droughty	0.43	Low adsorption	1.00	Droughty	0.43
	Restricted permeability	0.41	Droughty	0.43	Too acid	0.31
	Depth to bedrock	0.29	Too acid	0.31	Restricted permeability	0.31
	Too acid	0.08	Restricted permeability	0.31	Depth to bedrock	0.29
RnE2:						
Rodman	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 surface application	1.00
	Droughty	1.00	Droughty	1.00	Too steep for sprinkler application	1.00
	Leaching limitation	0.45			Droughty	1.00
RnF2:						
Rodman	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 surface application	1.00
	Droughty	1.00	Droughty	1.00	Too steep for sprinkler application	1.00
	Leaching limitation	0.45			Droughty	1.00
RoE2:						
Rodman	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 surface application	1.00
	Droughty	1.00	Droughty	1.00	Too steep for sprinkler application	1.00
	Leaching limitation	0.45			Droughty	1.00
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Restricted permeability	0.41	Restricted permeability	0.31	Too steep for sprinkler application	1.00
					Restricted permeability	0.31

Table 26.--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
RoF2:						
Rodman	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 surface application	1.00
	Droughty	1.00	Droughty	1.00	Too steep for sprinkler application	1.00
	Leaching limitation	0.45			Droughty	1.00
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Restricted permeability	0.41	Restricted permeability	0.31	Too steep for sprinkler application	1.00
					Restricted permeability	0.31
RpA:						
Rossburg	Very limited		Very limited		Somewhat limited	
	Flooding	1.00	Flooding	1.00	Flooding	0.60
	Filtering capacity	0.01	Filtering capacity	0.01	Filtering capacity	0.01
RuB:						
Russell	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.41	Restricted permeability	0.30	Restricted permeability	0.30
	Too acid	0.02	Too acid	0.07	Too steep for surface application	0.08
					Too acid	0.07
Miamian	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.43	Depth to saturated zone	0.43	Depth to saturated zone	0.43
	Shallow to densic materials	0.29	Shallow to densic materials	0.29	Too steep for surface application	0.08
RuB2:						
Russell	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.41	Restricted permeability	0.30	Restricted permeability	0.30
	Too acid	0.02	Too acid	0.07	Too steep for surface application	0.08
					Too acid	0.07

Table 26.--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
Miamian	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.43	Depth to saturated zone	0.43	Depth to saturated zone	0.43
	Shallow to densic materials	0.20	Shallow to densic materials	0.20	Too steep for surface application	0.08
SeA:						
Savona	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
SnA:						
Sloan	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Flooding	1.00	Flooding	1.00	Flooding	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Filtering capacity	0.01	Filtering capacity	0.01	Filtering capacity	0.01
StA:						
Stonelick	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Flooding	1.00	Flooding	1.00	Flooding	1.00
SvA:						
Sugarvalley	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too acid	0.08	Too acid	0.31	Too acid	0.31
SwA:						
Sugarvalley	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too acid	0.08	Too acid	0.31	Too acid	0.31
Fincastle	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Too acid	0.02	Too acid	0.07	Too acid	0.07
ThA:						
Thackery	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00

Table 26.--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
ThB:						
Thackery	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.43	Depth to saturated zone	0.43	Depth to saturated zone	0.43
					Too steep for surface application	0.08
Ud:						
Udorthents	Not rated		Not rated		Not rated	
W:						
Water	Not rated		Not rated		Not rated	
WbA:						
Warsaw	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Shallow to Discontinuity	0.46	Shallow to Discontinuity	0.46		
WnA:						
Westland	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
WyB:						
Wynn	Somewhat limited		Very limited		Somewhat limited	
	Restricted permeability	0.74	Low adsorption	1.00	Restricted permeability	0.60
	Depth to bedrock	0.35	Restricted permeability	0.60	Depth to bedrock	0.35
	Droughty	0.08	Depth to bedrock	0.35	Too steep for surface application	0.08
	Too acid	0.02	Droughty	0.08	Droughty	0.08
			Too acid	0.07	Too acid	0.07
WyB2:						
Wynn	Somewhat limited		Very limited		Somewhat limited	
	Restricted permeability	0.74	Low adsorption	1.00	Depth to bedrock	0.65
	Depth to bedrock	0.65	Depth to bedrock	0.65	Restricted permeability	0.60
	Droughty	0.11	Restricted permeability	0.60	Droughty	0.11
	Too acid	0.02	Droughty	0.11	Too steep for surface application	0.08
			Too acid	0.07	Too acid	0.07

Table 26.--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
WyC2:						
Wynn	Somewhat limited		Very limited		Very limited	
	Depth to bedrock	0.95	Low adsorption	1.00	Too steep for surface application	1.00
	Droughty	0.54	Depth to bedrock	0.95	Depth to bedrock	0.95
	Restricted permeability	0.41	Droughty	0.54	Droughty	0.54
	Slope	0.04	Restricted permeability	0.31	Restricted permeability	0.31
	Too acid	0.02	Too acid	0.07	Too steep for sprinkler application	0.22
WyD2:						
Wynn	Very limited		Very limited		Very limited	
	Slope	1.00	Low adsorption	1.00	Too steep for surface application	1.00
	Depth to bedrock	0.65	Slope	1.00	Too steep for sprinkler application	1.00
	Restricted permeability	0.41	Depth to bedrock	0.65	Depth to bedrock	0.65
	Droughty	0.09	Restricted permeability	0.31	Restricted permeability	0.31
	Too acid	0.02	Droughty	0.09	Droughty	0.09
XeA:						
Xenia	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
XeB:						
Xenia	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
					Too steep for surface application	0.08
XeB2:						
Xenia	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
					Too steep for surface application	0.08

TABLE 27.--WATER MANAGEMENT PART 1

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text on page 211 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
CeA:						
Celina	Not limited		Somewhat limited		Very limited	
			Thin layer	0.53	No ground water	1.00
			Depth to saturated zone	0.25		
CeB:						
Celina	Not limited		Somewhat limited		Very limited	
			Thin layer	0.61	No ground water	1.00
			Depth to saturated zone	0.25		
CeB2:						
Celina	Not limited		Somewhat limited		Very limited	
			Piping	0.50	No ground water	1.00
			Thin layer	0.26		
			Depth to saturated zone	0.25		
CoA:						
Corwin	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Thin layer	0.61	No ground water	1.00
			Depth to saturated zone	0.47		
CtA:						
Crosby	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Depth to saturated zone	1.00	No ground water	1.00
			Thin layer	0.63		
			Piping	0.50		
Celina	Not limited		Somewhat limited		Very limited	
			Piping	0.50	No ground water	1.00
			Thin layer	0.46		
			Depth to saturated zone	0.25		
CtB:						
Crosby	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Depth to saturated zone	1.00	No ground water	1.00
			Piping	0.50		
			Thin layer	0.39		
Celina	Not limited		Somewhat limited		Very limited	
			Thin layer	0.63	No ground water	1.00
			Depth to saturated zone	0.25		
CvA:						
Crosby	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Depth to saturated zone	1.00	No ground water	1.00
			Thin layer	0.53		
			Piping	0.50		

Table 27.--Water Management Part 1--Continued

Map symbol and soil name	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Lewisburg	Not limited		Somewhat limited		Very limited	
			Depth to saturated zone	0.87	No ground water	1.00
			Piping	0.50		
CyA:						
Cyclone	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.50	Ponding	1.00	Slow refill	0.28
			Depth to saturated zone	1.00	Cutbanks cave	0.10
			Thin layer	0.72		
			Piping	0.50		
DaA:						
Dana	Somewhat limited		Very limited		Very limited	
	Seepage	0.50	Thin layer	1.00	No ground water	1.00
			Depth to saturated zone	0.03		
DaB:						
Dana	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Thin layer	0.93	No ground water	1.00
			Depth to saturated zone	0.03		
EeA:						
Eel	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	0.10
			Seepage	1.00		
			Thin layer	0.93		
EgA:						
Eldean	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Thin layer	0.33	No ground water	1.00
EgB:						
Eldean	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Thin layer	0.33	No ground water	1.00
EgB2:						
Eldean	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Thin layer	0.20	No ground water	1.00
EhC3:						
Eldean	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Thin layer	0.07	No ground water	1.00
EhD3:						
Eldean	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Thin layer	0.50	No ground water	1.00
	Slope	0.03				
EkA:						
Eldean	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Thin layer	0.53	No ground water	1.00
EkB:						
Eldean	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Thin layer	0.46	No ground water	1.00
EkB2:						
Eldean	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Thin layer	0.39	No ground water	1.00

Table 27.--Water Management Part 1--Continued

Map symbol and soil name	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
FcA:						
Fincastle	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Depth to saturated zone	1.00	No ground water	1.00
			Thin layer	0.87		
FdA:						
Fincastle	Somewhat limited		Very limited		Very limited	
	Seepage	0.50	Thin layer	1.00	No ground water	1.00
			Depth to saturated zone	1.00		
FmA:						
Fox	Very limited		Very limited		Very limited	
	Seepage	1.00	Thin layer	1.00	No ground water	1.00
			Seepage	1.00		
FmB:						
Fox	Very limited		Very limited		Very limited	
	Seepage	1.00	Thin layer	1.00	No ground water	1.00
			Seepage	1.00		
FmB2:						
Fox	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	No ground water	1.00
			Thin layer	0.87		
HeF2:						
Hennepin	Somewhat limited		Not limited		Very limited	
	Slope	0.82			No ground water	1.00
Miamian	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.82	Thin layer	0.30	No ground water	1.00
HwE2:						
Hennepin	Somewhat limited		Not limited		Very limited	
	Slope	0.17			No ground water	1.00
Wynn	Somewhat limited		Very limited		Very limited	
	Slope	0.17	Thin layer	1.00	No ground water	1.00
	Depth to bedrock	0.11	Hard to compact	1.00		
HwF2:						
Hennepin	Somewhat limited		Not limited		Very limited	
	Slope	0.82			No ground water	1.00
Wynn	Somewhat limited		Very limited		Very limited	
	Slope	0.82	Thin layer	1.00	No ground water	1.00
	Depth to bedrock	0.30	Hard to compact	1.00		
KeC2:						
Kendallville	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Piping	0.50	No ground water	1.00
			Thin layer	0.33		
Eldean	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Thin layer	0.20	No ground water	1.00
KeD2:						
Kendallville	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Piping	0.50	No ground water	1.00
	Slope	0.03	Thin layer	0.39		

Table 27.--Water Management Part 1--Continued

Map symbol and soil name	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Eldean	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Thin layer	0.43	No ground water	1.00
	Slope	0.03				
KnA:						
Kokomo	Not limited		Very limited		Somewhat limited	
			Ponding	1.00	Slow refill	0.96
			Depth to saturated zone	1.00	Cutbanks cave	0.10
			Hard to compact	1.00		
			Thin layer	0.66		
KoA:						
Kokomo	Not limited		Very limited		Somewhat limited	
			Thin layer	1.00	Slow refill	0.96
			Ponding	1.00	Cutbanks cave	0.10
			Depth to saturated zone	1.00		
			Hard to compact	1.00		
LeB:						
Lewisburg	Not limited		Somewhat limited		Very limited	
			Depth to saturated zone	0.87	No ground water	1.00
			Piping	0.50		
Celina	Not limited		Somewhat limited		Very limited	
			Piping	0.50	No ground water	1.00
			Thin layer	0.46		
			Depth to saturated zone	0.25		
LfB2:						
Lewisburg	Not limited		Somewhat limited		Very limited	
			Depth to saturated zone	0.87	No ground water	1.00
			Piping	0.50		
Celina	Not limited		Somewhat limited		Very limited	
			Piping	0.50	No ground water	1.00
			Thin layer	0.33		
			Depth to saturated zone	0.25		
LgC3:						
Lewisburg	Not limited		Somewhat limited		Very limited	
			Depth to saturated zone	0.87	No ground water	1.00
			Piping	0.50		
LpA:						
Lippincott	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Ponding	1.00	Cutbanks cave	0.50
			Depth to saturated zone	1.00		
			Thin layer	0.53		
MaA:						
Medway	Very limited		Somewhat limited		Somewhat limited	
	Seepage	1.00	Thin layer	0.61	Depth to water	0.14
			Piping	0.50	Cutbanks cave	0.10
			Depth to saturated zone	0.37		

Table 27.--Water Management Part 1--Continued

Map symbol and soil name	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MbB2:						
Miami	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Piping	0.50	No ground water	1.00
			Thin layer	0.33		
			Depth to saturated zone	0.03		
McE2:						
Miami	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Piping	0.50	No ground water	1.00
	Slope	0.18	Thin layer	0.37		
			Depth to saturated zone	0.03		
Kendallville	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Piping	0.50	No ground water	1.00
	Slope	0.18	Thin layer	0.37		
McF2:						
Miami	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.80	Piping	0.50	No ground water	1.00
	Seepage	0.50	Thin layer	0.26		
			Depth to saturated zone	0.03		
Kendallville	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.80	Thin layer	0.67	No ground water	1.00
	Seepage	0.50	Piping	0.50		
MdC2:						
Miami	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Piping	0.50	No ground water	1.00
			Thin layer	0.20		
			Depth to saturated zone	0.03		
MdD2:						
Miami	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Piping	0.50	No ground water	1.00
	Slope	0.03	Thin layer	0.33		
			Depth to saturated zone	0.03		
MeC:						
Miamian	Not limited		Somewhat limited		Very limited	
			Thin layer	0.13	No ground water	1.00
MeC2:						
Miamian	Not limited		Somewhat limited		Very limited	
			Thin layer	0.30	No ground water	1.00
MeD2:						
Miamian	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.03	Thin layer	0.24	No ground water	1.00
MfB:						
Miamian	Not limited		Somewhat limited		Very limited	
			Thin layer	0.50	No ground water	1.00
Celina	Not limited		Somewhat limited		Very limited	
			Piping	0.50	No ground water	1.00
			Thin layer	0.46		
			Depth to saturated zone	0.25		

Table 27.--Water Management Part 1--Continued

Map symbol and soil name	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MfB2:						
Miamian	Not limited		Somewhat limited		Very limited	
			Thin layer	0.53	No ground water	1.00
Celina	Not limited		Somewhat limited		Very limited	
			Piping	0.50	No ground water	1.00
			Thin layer	0.43		
			Depth to saturated zone	0.25		
MgE2:						
Miamian	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.18	Thin layer	0.61	No ground water	1.00
Kendallville	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Piping	0.50	No ground water	1.00
	Slope	0.18	Thin layer	0.30		
MgF2:						
Miamian	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.80	Thin layer	0.26	No ground water	1.00
Kendallville	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.80	Thin layer	0.50	No ground water	1.00
	Seepage	0.50				
MhC3:						
Miamian	Not limited		Somewhat limited		Very limited	
			Thin layer	0.20	No ground water	1.00
Losantville	Not limited		Very limited		Somewhat limited	
			Depth to saturated zone	1.00	Slow refill	0.96
			Piping	0.50	Cutbanks cave	0.10
MhD3:						
Miamian	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.03	Thin layer	0.43	No ground water	1.00
Losantville	Somewhat limited		Very limited		Very limited	
	Slope	0.03	Depth to saturated zone	1.00	Slow refill	1.00
			Piping	0.50	Cutbanks cave	0.10
MmE2:						
Miamian	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.18	Thin layer	0.20	No ground water	1.00
Hennepin	Somewhat limited		Not limited		Very limited	
	Slope	0.18			No ground water	1.00
MnE3:						
Miamian	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.18	Thin layer	0.20	No ground water	1.00
Hennepin	Somewhat limited		Not limited		Very limited	
	Slope	0.18			No ground water	1.00
MpA:						
Milford	Not limited		Very limited		Somewhat limited	
			Ponding	1.00	Slow refill	0.96
			Depth to saturated zone	1.00	Cutbanks cave	0.10
			Thin layer	0.87		

Table 27.--Water Management Part 1--Continued

Map symbol and soil name	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MrA:						
Milford	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.50	Thin layer	1.00	Cutbanks cave	0.50
			Ponding	1.00		
			Depth to saturated zone	1.00		
MsA:						
Millsdale	Somewhat limited		Very limited		Very limited	
	Depth to bedrock	0.96	Thin layer	1.00	Depth to bedrock	1.00
			Ponding	1.00	Slow refill	0.96
			Depth to saturated zone	1.00	Cutbanks cave	0.10
			Hard to compact	1.00		
MtA:						
Millsdale	Somewhat limited		Very limited		Very limited	
	Depth to bedrock	0.86	Thin layer	1.00	Depth to bedrock	1.00
			Ponding	1.00	Slow refill	0.96
			Depth to saturated zone	1.00	Cutbanks cave	0.10
			Hard to compact	1.00		
MuA:						
Milton	Somewhat limited		Very limited		Very limited	
	Depth to bedrock	0.83	Thin layer	1.00	No ground water	1.00
	Seepage	0.25	Piping	0.50		
MuB:						
Milton	Somewhat limited		Very limited		Very limited	
	Depth to bedrock	0.91	Thin layer	1.00	No ground water	1.00
	Seepage	0.25	Piping	0.50		
MuB2:						
Milton	Somewhat limited		Very limited		Very limited	
	Depth to bedrock	0.91	Thin layer	1.00	No ground water	1.00
	Seepage	0.25				
MuC2:						
Milton	Somewhat limited		Very limited		Very limited	
	Depth to bedrock	0.91	Thin layer	1.00	No ground water	1.00
	Seepage	0.25				
MuD2:						
Milton	Somewhat limited		Very limited		Very limited	
	Depth to bedrock	0.88	Thin layer	1.00	No ground water	1.00
	Seepage	0.25				
	Slope	0.03				
MuE2:						
Milton	Somewhat limited		Very limited		Very limited	
	Depth to bedrock	0.99	Thin layer	1.00	No ground water	1.00
	Seepage	0.25	Piping	0.50		
	Slope	0.17				
MwA:						
Morningsun	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.50	Thin layer	1.00	Cutbanks cave	0.50
			Piping	0.50	Slow refill	0.28
			Depth to saturated zone	0.37	Depth to water	0.14

Table 27.--Water Management Part 1--Continued

Map symbol and soil name	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MxA:						
Morningsun	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.50	Thin layer	1.00	Cutbanks cave	0.50
			Depth to saturated zone	0.37	Slow refill	0.28
					Depth to water	0.14
Xenia	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Thin layer	0.83	No ground water	1.00
			Depth to saturated zone	0.47		
MxB:						
Morningsun	Somewhat limited		Somewhat limited		Somewhat limited	
	Seepage	0.50	Thin layer	0.93	Cutbanks cave	0.50
			Piping	0.50	Slow refill	0.28
			Depth to saturated zone	0.37	Depth to water	0.14
Xenia	Somewhat limited		Very limited		Very limited	
	Seepage	0.50	Thin layer	1.00	No ground water	1.00
			Depth to saturated zone	0.47		
MxB2:						
Morningsun	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.50	Thin layer	1.00	Cutbanks cave	0.50
			Piping	0.50	Slow refill	0.28
			Depth to saturated zone	0.37	Depth to water	0.14
Xenia	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Thin layer	0.83	No ground water	1.00
			Depth to saturated zone	0.47		
MyA:						
Mahalasville	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Ponding	1.00	Cutbanks cave	0.50
			Depth to saturated zone	1.00		
			Thin layer	0.80		
OcA:						
Ockley	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Thin layer	0.70	No ground water	1.00
OcB:						
Ockley	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Thin layer	0.63	No ground water	1.00
Pg:						
Pits, Gravel	Not Rated		Not Rated		Not Rated	
Pq:						
Pits, Quarry	Not Rated		Not Rated		Not Rated	
PtB:						
Plattville	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.50	Thin layer	1.00	Slow refill	0.28
	Depth to bedrock	0.03	Piping	0.50	Depth to water	0.25
			Depth to saturated zone	0.11	Depth to bedrock	0.13
					Cutbanks cave	0.10

Table 27.--Water Management Part 1--Continued

Map symbol and soil name	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
RaA:						
Rainsville----------	Somewhat limited		Very limited		Very limited	
	Seepage	0.50	Thin layer	1.00	No ground water	1.00
			Piping	0.50		
			Depth to saturated zone	0.12		
RaB:						
Rainsville----------	Somewhat limited		Very limited		Very limited	
	Seepage	0.50	Thin layer	1.00	No ground water	1.00
			Piping	0.50		
			Depth to saturated zone	0.12		
RaB2:						
Rainsville----------	Somewhat limited		Very limited		Very limited	
	Seepage	0.50	Thin layer	1.00	No ground water	1.00
			Piping	0.50		
			Depth to saturated zone	0.12		
RcA:						
Randolph----------	Somewhat limited		Very limited		Very limited	
	Depth to bedrock	0.77	Thin layer	1.00	Depth to bedrock	1.00
			Depth to saturated zone	1.00	Slow refill	0.96
			Hard to compact	1.00	Cutbanks cave	0.10
RcB:						
Randolph----------	Somewhat limited		Very limited		Very limited	
	Depth to bedrock	0.81	Thin layer	1.00	Depth to bedrock	1.00
			Depth to saturated zone	1.00	Slow refill	0.96
			Hard to compact	1.00	Cutbanks cave	0.10
RnE2:						
Rodman----------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.18	No ground water	1.00
	Slope	0.17				
RnF2:						
Rodman----------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.18	No ground water	1.00
	Slope	0.80				
RoE2:						
Rodman----------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.18	No ground water	1.00
	Slope	0.17				
Kendallville--------	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Thin layer	0.76	No ground water	1.00
	Slope	0.17	Piping	0.50		
RoF2:						
Rodman----------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.18	No ground water	1.00
	Slope	0.80				
Kendallville--------	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.80	Thin layer	0.67	No ground water	1.00
	Seepage	0.50				

Table 27.--Water Management Part 1--Continued

Map symbol and soil name	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
RpA:						
Rossburg	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Thin layer	1.00	Depth to water	0.99
			Seepage	1.00	Cutbanks cave	0.50
RuB:						
Russell	Somewhat limited		Very limited		Very limited	
	Seepage	0.50	Thin layer	1.00	No ground water	1.00
Miamian	Not limited		Somewhat limited		Very limited	
			Thin layer	0.39	No ground water	1.00
RuB2:						
Russell	Somewhat limited		Very limited		Very limited	
	Seepage	0.50	Thin layer	1.00	No ground water	1.00
Miamian	Not limited		Somewhat limited		Very limited	
			Thin layer	0.43	No ground water	1.00
SeA:						
Savona	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
			Seepage	1.00		
			Thin layer	0.83		
SnA:						
Sloan	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Ponding	1.00	Cutbanks cave	0.50
			Depth to saturated zone	1.00		
			Thin layer	0.83		
			Piping	0.50		
StA:						
Stonelick	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Thin layer	0.33	No ground water	1.00
			Seepage	0.18		
SvA:						
Sugarvalley	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.50	Depth to saturated zone	1.00	Cutbanks cave	0.50
			Thin layer	0.96	Slow refill	0.28
			Piping	0.50		
SwA:						
Sugarvalley	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.50	Thin layer	1.00	Cutbanks cave	0.50
			Depth to saturated zone	1.00	Slow refill	0.28
Fincastle	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Depth to saturated zone	1.00	No ground water	1.00
			Thin layer	0.93		
ThA:						
Thackery	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	0.50
			Thin layer	0.89		
			Piping	0.50		

Table 27.--Water Management Part 1--Continued

Map symbol and soil name	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
ThB:						
Thackery	Very limited		Somewhat limited		Somewhat limited	
	Seepage	1.00	Piping	0.50	Cutbanks cave	0.50
			Thin layer	0.16	Depth to water	0.25
			Depth to saturated zone	0.11		
Ud:						
Udorthents	Not Rated		Not Rated		Not Rated	
W:						
Water	Not Rated		Not Rated		Not Rated	
WbA:						
Warsaw	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Thin layer	0.33	No ground water	1.00
			Seepage	0.18		
WnA:						
Westland	Very limited		Very limited		Very limited	
	Seepage	1.00	Ponding	1.00	Cutbanks cave	1.00
			Depth to saturated zone	1.00		
			Thin layer	0.96		
WyB:						
Wynn	Somewhat limited		Very limited		Very limited	
	Depth to bedrock	0.09	Thin layer	1.00	No ground water	1.00
			Hard to compact	1.00		
WyB2:						
Wynn	Somewhat limited		Very limited		Very limited	
	Depth to bedrock	0.17	Thin layer	1.00	No ground water	1.00
			Hard to compact	1.00		
WyC2:						
Wynn	Somewhat limited		Very limited		Very limited	
	Depth to bedrock	0.34	Thin layer	1.00	No ground water	1.00
			Hard to compact	1.00		
WyD2:						
Wynn	Somewhat limited		Very limited		Very limited	
	Depth to bedrock	0.17	Thin layer	1.00	No ground water	1.00
	Slope	0.03	Hard to compact	1.00		
XeA:						
Xenia	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Thin layer	0.93	No ground water	1.00
			Depth to saturated zone	0.47		
XeB:						
Xenia	Somewhat limited		Very limited		Very limited	
	Seepage	0.50	Thin layer	1.00	No ground water	1.00
			Piping	0.50		
			Depth to saturated zone	0.47		
XeB2:						
Xenia	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Thin layer	0.80	No ground water	1.00
			Depth to saturated zone	0.47		

Table 27.--Water Management Part 1--Continued

Map symbol and soil name	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
XfB:						
Xenia	Somewhat limited		Very limited		Very limited	
	Seepage	0.50	Thin layer	1.00	No ground water	1.00
			Piping	0.50		
			Depth to saturated zone	0.47		

TABLE 28.--WATER MANAGEMENT PART 2

(The information in this table indicates the dominant soil condition but does not eliminate the need for on-site investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text on page 211 for further explanation of ratings in this table.)

Map symbol and soil name	Constructing Grassed Waterways		Constructing Terraces and Diversions		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CeA:						
Celina	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Restricted permeability	0.99	Depth to saturated zone	1.00	Restricted permeability	0.99
	Depth to saturated zone	0.68	Restricted permeability	0.99		
CeB:						
Celina	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Restricted permeability	0.99	Depth to saturated zone	1.00	Restricted permeability	0.99
	Depth to saturated zone	0.68	Restricted permeability	0.99	Slope	0.04
CeB2:						
Celina	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Restricted permeability	0.99	Depth to saturated zone	1.00	Restricted permeability	0.99
	Depth to saturated zone	0.68	Restricted permeability	0.99	Slope	0.04
CoA:						
Corwin	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Restricted permeability	0.91
	Restricted permeability	0.91	Depth to saturated zone	1.00		
	Depth to saturated zone	0.86	Restricted permeability	0.91		
CtA:						
Crosby	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Restricted permeability	0.94
	Restricted permeability	0.94	Restricted permeability	0.94		
Celina	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Restricted permeability	0.99	Depth to saturated zone	1.00	Restricted permeability	0.99
	Depth to saturated zone	0.68	Restricted permeability	0.99		
CtB:						
Crosby	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Restricted permeability	0.94
	Restricted permeability	0.94	Restricted permeability	0.94		

Table 28.--Water Management Part 2--Continued

Map symbol and soil name	Constructing Grassed Waterways		Constructing Terraces and Diversions		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Celina	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Restricted permeability	0.99	Depth to saturated zone	1.00	Restricted permeability	0.99
	Depth to saturated zone	0.68	Restricted permeability	0.99		
CvA:						
Crosby	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Restricted permeability	0.94
	Restricted permeability	0.94	Restricted permeability	0.94		
Lewisburg	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Restricted permeability	0.91
	Restricted permeability	0.91	Restricted permeability	0.91		
CyA:						
Cyclone	Very Limited		Very Limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
			Ponding	1.00	Frost action	1.00
DaA:						
Dana	Somewhat Limited		Very Limited		Very limited	
	Depth to saturated zone	0.24	Depth to saturated zone	1.00	Frost action	1.00
DaB:						
Dana	Somewhat Limited		Very Limited		Very limited	
	Depth to saturated zone	0.24	Depth to saturated zone	1.00	Frost action	1.00
					Slope	0.04
EeA:						
Eel	Somewhat Limited		Very Limited		Very limited	
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Frost action	1.00
					Flooding	1.00
EgA:						
Eldean	Very Limited		Very Limited		Very limited	
	Droughty	1.00	Too sandy	1.00	Cutbanks cave	1.00
					Depth to saturated zone	1.00
EgB:						
Eldean	Very Limited		Very Limited		Very limited	
	Droughty	1.00	Too sandy	1.00	Cutbanks cave	1.00
					Depth to saturated zone	1.00
					Slope	0.04
EgB2:						
Eldean	Very Limited		Very Limited		Very limited	
	Droughty	1.00	Too sandy	1.00	Cutbanks cave	1.00
	Content of large stones	0.01	Content of large stones	0.01	Depth to saturated zone	1.00
					Slope	0.04

Table 28.--Water Management Part 2--Continued

Map symbol and soil name	Constructing Grassed Waterways		Constructing Terraces and Diversions		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
EhC3:						
Eldean	Very Limited		Very Limited		Very limited	
	Slope	1.00	Too sandy	1.00	Cutbanks cave	1.00
	Droughty	1.00	Slope	1.00	Depth to saturated zone	1.00
	Content of large stones	0.01	Content of large stones	0.01	Slope	0.96
EhD3:						
Eldean	Very Limited		Very Limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
					Depth to saturated zone	1.00
EkA:						
Eldean	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	1.00
EkB:						
Eldean	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	1.00
					Slope	0.04
EkB2:						
Eldean	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	1.00
					Slope	0.04
FcA:						
Fincastle	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Restricted permeability	0.22
	Restricted permeability	0.22	Restricted permeability	0.22		
FdA:						
Fincastle	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Restricted permeability	0.22
	Restricted permeability	0.22	Restricted permeability	0.22		
FmA:						
Fox	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	1.00
			Too sandy	1.00		
FmB:						
Fox	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	1.00
			Too sandy	1.00	Slope	0.04
FmB2:						
Fox	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	1.00
			Too sandy	1.00	Slope	0.04

Table 28.--Water Management Part 2--Continued

Map symbol and soil name	Constructing Grassed Waterways		Constructing Terraces and Diversions		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HeF2:						
Hennepin	Very Limited		Very Limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.91	Restricted permeability	0.91	Depth to saturated zone	1.00
					Restricted permeability	0.91
Miamian	Very Limited		Very Limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.91	Restricted permeability	0.91	Restricted permeability	0.91
	Depth to saturated zone	0.09				
HwE2:						
Hennepin	Very Limited		Very Limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.91	Restricted permeability	0.91	Depth to saturated zone	1.00
					Restricted permeability	0.91
Wynn	Very Limited		Very Limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Depth to saturated zone	1.00
	Depth to soft bedrock	0.46	Depth to soft bedrock	0.46	Restricted permeability	0.22
	Restricted permeability	0.22	Restricted permeability	0.22	Depth to bedrock	0.12
HwF2:						
Hennepin	Very Limited		Very Limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.91	Restricted permeability	0.91	Depth to saturated zone	1.00
					Restricted permeability	0.91
Wynn	Very Limited		Very Limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Depth to saturated zone	1.00
	Depth to soft bedrock	0.90	Depth to soft bedrock	0.90	Depth to bedrock	0.30
	Restricted permeability	0.22	Restricted permeability	0.22	Restricted permeability	0.22
KeC2:						
Kendallville	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	1.00
	Slope	1.00	Slope	1.00	Slope	0.96
	Restricted permeability	0.22	Restricted permeability	0.22	Restricted permeability	0.22
Eldean	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Cutbanks cave	1.00
	Slope	1.00	Too sandy	1.00	Depth to saturated zone	1.00
	Droughty	1.00	Slope	1.00	Slope	0.96

Table 28.--Water Management Part 2--Continued

Map symbol and soil name	Constructing Grassed Waterways		Constructing Terraces and Diversions		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
KeD2:						
Kendallville	Very Limited		Very Limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.22	Restricted permeability	0.22	Restricted permeability	0.22
Eldean	Very Limited		Very Limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Cutbanks cave	1.00
			Too sandy	1.00	Depth to saturated zone	1.00
KnA:						
Kokomo	Very Limited		Very Limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Restricted permeability	0.22	Ponding	1.00	Frost action	1.00
			Restricted permeability	0.22	Restricted permeability	0.22
KoA:						
Kokomo	Very Limited		Very Limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Restricted permeability	0.22	Ponding	1.00	Frost action	1.00
			Restricted permeability	0.22	Restricted permeability	0.22
LeB:						
Lewisburg	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Restricted permeability	0.91
	Restricted permeability	0.91	Restricted permeability	0.91	Slope	0.04
Celina	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Restricted permeability	0.99	Depth to saturated zone	1.00	Restricted permeability	0.99
	Depth to saturated zone	0.68	Restricted permeability	0.99	Slope	0.04
LfB2:						
Lewisburg	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Restricted permeability	0.91
	Restricted permeability	0.91	Restricted permeability	0.91	Slope	0.04
Celina	Somewhat Limited		Very Limited		Very limited	
	Restricted permeability	0.99	Depth to saturated zone	1.00	Frost action	1.00
	Depth to saturated zone	0.68	Restricted permeability	0.99	Restricted permeability	0.99
					Slope	0.04

Table 28.--Water Management Part 2--Continued

Map symbol and soil name	Constructing Grassed Waterways		Constructing Terraces and Diversions		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
LgC3:						
Lewisburg	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope	0.96
	Slope	1.00	Slope	1.00	Restricted permeability	0.91
	Restricted permeability	0.91	Restricted permeability	0.91		
LpA:						
Lippincott	Very Limited		Very Limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
			Ponding	1.00	Frost action	1.00
			Too sandy	1.00	Cutbanks cave	1.00
MaA:						
Medway	Somewhat Limited		Very Limited		Very limited	
	Depth to saturated zone	0.24	Depth to saturated zone	1.00	Frost action	1.00
					Flooding	1.00
MbB2:						
Miami	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Restricted permeability	0.99
	Restricted permeability	0.99	Depth to saturated zone	1.00	Slope	0.05
	Depth to saturated zone	0.24	Restricted permeability	0.99		
McE2:						
Miami	Very Limited		Very Limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Restricted permeability	0.99
	Restricted permeability	0.99	Depth to saturated zone	1.00		
	Depth to saturated zone	0.24	Restricted permeability	0.99		
Kendallville	Very Limited		Very Limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.22	Restricted permeability	0.22	Restricted permeability	0.22
McF2:						
Miami	Very Limited		Very Limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Restricted permeability	0.99
	Restricted permeability	0.99	Depth to saturated zone	1.00		
	Depth to saturated zone	0.24	Restricted permeability	0.99		
Kendallville	Very Limited		Very Limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Depth to saturated zone	1.00

Table 28.--Water Management Part 2--Continued

Map symbol and soil name	Constructing Grassed Waterways		Constructing Terraces and Diversions		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MdC2:						
Miami	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Restricted permeability	0.99
	Slope	1.00	Slope	1.00	Slope	0.96
	Restricted permeability	0.99	Depth to saturated zone	1.00		
	Depth to saturated zone	0.24	Restricted permeability	0.99		
MdD2:						
Miami	Very Limited		Very Limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Restricted permeability	0.99
	Restricted permeability	0.99	Depth to saturated zone	1.00		
	Depth to saturated zone	0.24	Restricted permeability	0.99		
MeC:						
Miamian	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	1.00
	Slope	1.00	Slope	1.00	Slope	0.96
	Restricted permeability	0.91	Restricted permeability	0.91	Restricted permeability	0.91
	Depth to saturated zone	0.09				
MeC2:						
Miamian	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	1.00
	Slope	1.00	Slope	1.00	Slope	0.96
	Restricted permeability	0.91	Restricted permeability	0.91	Restricted permeability	0.91
	Depth to saturated zone	0.09				
MeD2:						
Miamian	Very Limited		Very Limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.91	Restricted permeability	0.91	Restricted permeability	0.91
	Depth to saturated zone	0.09				
MfB:						
Miamian	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.91	Restricted permeability	0.91	Restricted permeability	0.91
	Depth to saturated zone	0.09			Slope	0.04

Table 28.--Water Management Part 2--Continued

Map symbol and soil name	Constructing Grassed Waterways		Constructing Terraces and Diversions		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Celina----------	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Restricted permeability	0.99	Depth to saturated zone	1.00	Restricted permeability	0.99
	Depth to saturated zone	0.68	Restricted permeability	0.99	Slope	0.04
MfB2:						
Miamian----------	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.91	Restricted permeability	0.91	Restricted permeability	0.91
	Depth to saturated zone	0.09			Slope	0.04
Celina----------	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Restricted permeability	0.99	Depth to saturated zone	1.00	Restricted permeability	0.99
	Depth to saturated zone	0.68	Restricted permeability	0.99	Slope	0.04
MgE2:						
Miamian----------	Very Limited		Very Limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.91	Restricted permeability	0.91	Restricted permeability	0.91
	Depth to saturated zone	0.09				
Kendallville--------	Very Limited		Very Limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.22	Restricted permeability	0.22	Restricted permeability	0.22
MgF2:						
Miamian----------	Very Limited		Very Limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.91	Restricted permeability	0.91	Restricted permeability	0.91
	Depth to saturated zone	0.09				
Kendallville--------	Very Limited		Very Limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.22	Restricted permeability	0.22	Restricted permeability	0.22

Table 28.--Water Management Part 2--Continued

Map symbol and soil name	Constructing Grassed Waterways		Constructing Terraces and Diversions		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MhC3:						
Miamian	Very Limited		Very Limited		Very limited	
	Slope	1.00	Slope	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.91	Restricted permeability	0.91	Slope	0.96
	Depth to saturated zone	0.09			Restricted permeability	0.91
Losantville	Very Limited		Very Limited		Very limited	
	Droughty	1.00	Depth to saturated zone	1.00	Slope	0.96
	Slope	1.00	Slope	1.00	Restricted permeability	0.94
	Depth to saturated zone	1.00	Restricted permeability	0.94		
	Restricted permeability	0.94				
MhD3:						
Miamian	Very Limited		Very Limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.91	Restricted permeability	0.91	Depth to saturated zone	1.00
	Depth to saturated zone	0.09			Restricted permeability	0.91
Losantville	Very Limited		Very Limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Droughty	1.00	Depth to saturated zone	1.00	Restricted permeability	0.94
	Depth to saturated zone	1.00	Restricted permeability	0.94		
	Restricted permeability	0.94				
MmE2:						
Miamian	Very Limited		Very Limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.91	Restricted permeability	0.91	Restricted permeability	0.91
	Depth to saturated zone	0.09				
Hennepin	Very Limited		Very Limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.91	Restricted permeability	0.91	Depth to saturated zone	1.00
					Restricted permeability	0.91
MnE3:						
Miamian	Very Limited		Very Limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.91	Restricted permeability	0.91	Depth to saturated zone	1.00
	Depth to saturated zone	0.09			Restricted permeability	0.91

Table 28.--Water Management Part 2--Continued

Map symbol and soil name	Constructing Grassed Waterways		Constructing Terraces and Diversions		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Hennepin----------	Very Limited		Very Limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.91	Restricted permeability	0.91	Depth to saturated zone	1.00
					Restricted permeability	0.91
MpA:						
Milford----------	Very Limited		Very Limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Restricted permeability	0.22	Ponding	1.00	Frost action	1.00
			Restricted permeability	0.22	Restricted permeability	0.22
MrA:						
Milford----------	Very Limited		Very Limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Restricted permeability	0.22	Ponding	1.00	Frost action	1.00
			Restricted permeability	0.22	Restricted permeability	0.22
MsA:						
Millsdale----------	Very Limited		Very Limited		Very limited	
	Depth to hard bedrock	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Ponding	1.00	Frost action	1.00
	Restricted permeability	0.22	Depth to hard bedrock	0.84	Depth to bedrock	0.26
			Restricted permeability	0.22	Restricted permeability	0.22
MtA:						
Millsdale----------	Very Limited		Very Limited		Very limited	
	Depth to hard bedrock	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Ponding	1.00	Frost action	1.00
	Restricted permeability	0.22	Depth to hard bedrock	0.46	Restricted permeability	0.22
			Restricted permeability	0.22	Depth to bedrock	0.12
MuA:						
Milton----------	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	1.00
	Depth to hard bedrock	1.00	Depth to hard bedrock	0.35	Depth to bedrock	0.09
MuB:						
Milton----------	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	1.00
	Depth to hard bedrock	1.00	Depth to hard bedrock	0.64	Depth to bedrock	0.17
					Slope	0.04

Table 28.--Water Management Part 2—Continued

Map symbol and soil name	Constructing Grassed Waterways		Constructing Terraces and Diversions		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MuB2:						
Milton	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	1.00
	Depth to hard bedrock	1.00	Depth to hard bedrock	0.64	Depth to bedrock	0.17
					Slope	0.04
MuC2:						
Milton	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	1.00
	Depth to hard bedrock	1.00	Slope	1.00	Slope	0.96
	Slope	1.00	Depth to hard bedrock	0.64	Depth to bedrock	0.17
MuD2:						
Milton	Very Limited		Very Limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Depth to saturated zone	1.00
	Depth to hard bedrock	1.00	Depth to hard bedrock	0.54	Depth to bedrock	0.14
MuE2:						
Milton	Very Limited		Very Limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Depth to saturated zone	1.00
	Depth to hard bedrock	1.00	Depth to hard bedrock	0.95	Depth to bedrock	0.35
	Droughty	1.00				
MwA:						
Morningsun	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	0.24	Depth to saturated zone	1.00		
MxA:						
Morningsun	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	0.24	Depth to saturated zone	1.00		
Xenia	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	0.86	Depth to saturated zone	1.00	Restricted permeability	0.22
	Restricted permeability	0.22	Restricted permeability	0.22		
MxB:						
Morningsun	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	0.24	Depth to saturated zone	1.00	Slope	0.04

Table 28.--Water Management Part 2—Continued

Map symbol and soil name	Constructing Grassed Waterways		Constructing Terraces and Diversions		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Xenia	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	0.86	Depth to saturated zone	1.00	Restricted permeability	0.22
	Restricted permeability	0.22	Restricted permeability	0.22	Slope	0.04
MxB2:						
Morningsun	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	0.24	Too sandy	1.00	Slope	0.04
			Depth to saturated zone	1.00		
Xenia	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	0.86	Depth to saturated zone	1.00	Restricted permeability	0.22
	Restricted permeability	0.22	Restricted permeability	0.22	Slope	0.04
MyA:						
Mahalasville	Very Limited		Very Limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
			Ponding	1.00	Frost action	1.00
OcA:						
Ockley	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	1.00
OcB:						
Ockley	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	1.00
					Slope	0.04
Pg:						
Pits, Gravel	Not Rated		Not Rated		Not Rated	
Pq:						
Pits, Quarry	Not Rated		Not Rated		Not Rated	
PtB:						
Plattville	Somewhat Limited		Not Limited		Very limited	
	Depth to hard bedrock	0.13			Depth to saturated zone	1.00
	Depth to saturated zone	0.09			Slope	0.04
RaA:						
Rainsville	Very Limited		Very Limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Restricted permeability	0.22
	Depth to saturated zone	0.47	Depth to saturated zone	1.00		
	Restricted permeability	0.22	Restricted permeability	0.22		

Table 28.--Water Management Part 2—Continued

Map symbol and soil name	Constructing Grassed Waterways		Constructing Terraces and Diversions		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
RaB:						
Rainsville	Very Limited		Very Limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Slope	0.05
	Depth to saturated zone	0.47	Depth to saturated zone	1.00		
RaB2:						
Rainsville	Very Limited		Very Limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Restricted permeability	0.22
	Depth to saturated zone	0.47	Depth to saturated zone	1.00	Slope	0.05
	Restricted permeability	0.22	Restricted permeability	0.22		
RcA:						
Randolph	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to hard bedrock	1.00	Depth to saturated zone	1.00	Restricted permeability	0.22
	Depth to saturated zone	1.00	Restricted permeability	0.22	Depth to bedrock	0.05
	Restricted permeability	0.22	Depth to hard bedrock	0.20		
RcB:						
Randolph	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to hard bedrock	1.00	Depth to saturated zone	1.00	Restricted permeability	0.22
	Depth to saturated zone	1.00	Depth to hard bedrock	0.29	Depth to bedrock	0.07
	Restricted permeability	0.22	Restricted permeability	0.22	Slope	0.04
RnE2:						
Rodman	Very Limited		Very Limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Droughty	1.00	Too sandy	1.00	Cutbanks cave	1.00
					Depth to saturated zone	1.00
RnF2:						
Rodman	Very Limited		Very Limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Droughty	1.00	Too sandy	1.00	Cutbanks cave	1.00
					Depth to saturated zone	1.00
RoE2:						
Rodman	Very Limited		Very Limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Droughty	1.00	Too sandy	1.00	Cutbanks cave	1.00
					Depth to saturated zone	1.00
Kendallville	Very Limited		Very Limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Depth to saturated zone	1.00

Table 28.--Water Management Part 2—Continued

Map symbol and soil name	Constructing Grassed Waterways		Constructing Terraces and Diversions		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
RoF2:						
Rodman	Very Limited		Very Limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Droughty	1.00	Too sandy	1.00	Cutbanks cave	1.00
					Depth to saturated zone	1.00
Kendallville	Very Limited		Very Limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Depth to saturated zone	1.00
RpA:						
Rossburg	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Flooding	1.00
			Too sandy	1.00	Depth to saturated zone	1.00
RuB:						
Russell	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
					Depth to saturated zone	1.00
					Slope	0.04
Miamian	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.91	Restricted permeability	0.91	Restricted permeability	0.91
	Depth to saturated zone	0.09			Slope	0.04
RuB2:						
Russell	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
					Depth to saturated zone	1.00
					Slope	0.04
Miamian	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.91	Restricted permeability	0.91	Restricted permeability	0.91
	Depth to saturated zone	0.09			Slope	0.04
SeA:						
Savona	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
			Too sandy	1.00		
SnA:						
Sloan	Very Limited		Very Limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
			Ponding	1.00	Frost action	1.00
					Flooding	1.00

Table 28.--Water Management Part 2—Continued

Map symbol and soil name	Constructing Grassed Waterways		Constructing Terraces and Diversions		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
StA:						
Stonelick	Not Limited		Very Limited		Very limited	
			Too sandy	1.00	Cutbanks cave	1.00
					Flooding	1.00
					Depth to saturated zone	1.00
SvA:						
Sugarvalley	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
SwA:						
Sugarvalley	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
Fincastle	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
ThA:						
Thackery	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	0.96	Depth to saturated zone	1.00		
ThB:						
Thackery	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	0.09			Depth to saturated zone	1.00
					Slope	0.04
Ud:						
Udorthents	Not Rated		Not Rated		Not Rated	
W:						
Water	Not Rated		Not Rated		Not Rated	
WbA:						
Warsaw	Not Limited		Very Limited		Very limited	
			Too sandy	1.00	Cutbanks cave	1.00
					Depth to saturated zone	1.00
WnA:						
Westland	Very Limited		Very Limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
			Ponding	1.00	Frost action	1.00
WyB:						
Wynn	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.40	Restricted permeability	0.40	Restricted permeability	0.40
	Depth to soft bedrock	0.35	Depth to soft bedrock	0.35	Depth to bedrock	0.09
					Slope	0.04

Table 28.--Water Management Part 2—Continued

Map symbol and soil name	Constructing Grassed Waterways		Constructing Terraces and Diversions		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WyB2:						
Wynn	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	1.00
	Depth to soft bedrock	0.64	Depth to soft bedrock	0.64	Restricted permeability	0.40
	Restricted permeability	0.40	Restricted permeability	0.40	Depth to bedrock	0.17
					Slope	0.04
WyC2:						
Wynn	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	1.00
	Slope	1.00	Slope	1.00	Slope	0.96
	Depth to soft bedrock	0.95	Depth to soft bedrock	0.95	Depth to bedrock	0.35
	Restricted permeability	0.22	Restricted permeability	0.22	Restricted permeability	0.22
WyD2:						
Wynn	Very Limited		Very Limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Depth to saturated zone	1.00
	Depth to soft bedrock	0.64	Depth to soft bedrock	0.64	Restricted permeability	0.22
	Restricted permeability	0.22	Restricted permeability	0.22	Depth to bedrock	0.17
XeA:						
Xenia	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	0.86	Depth to saturated zone	1.00	Restricted permeability	0.22
	Restricted permeability	0.22	Restricted permeability	0.22		
XeB:						
Xenia	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	0.86	Depth to saturated zone	1.00	Restricted permeability	0.22
	Restricted permeability	0.22	Restricted permeability	0.22	Slope	0.04
XeB2:						
Xenia	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	0.86	Depth to saturated zone	1.00	Restricted permeability	0.22
	Restricted permeability	0.22	Restricted permeability	0.22	Slope	0.04
XfB:						
Xenia	Very Limited		Very Limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	0.86	Depth to saturated zone	1.00	Restricted permeability	0.22
	Restricted permeability	0.22	Restricted permeability	0.22	Slope	0.04

TABLE 29.--ENGINEERING INDEX PROPERTIES

(Absence of an entry indicates that the data were not estimated. See text on page 213 for additional information.)

(Absence of an entry indicates that the 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	
CeA:												
Celina----------	0-10	Silt loam	ML	A-4	0	0	100	90-100	90-100	70-85	22-42	2-12
	10-36	Silt loam, loam, clay loam, silty clay loam	CL	A-6, A-7, A-7-6	0	0	100	90-100	80-95	70-85	35-60	25-35
	36-80	Loam, silt loam	CL, CL-ML	A-4, A-6	0	0	75-95	75-90	65-90	50-80	15-25	4-12
CeB:												
Celina----------	0-9	Silt loam	ML	A-4	0	0	100	90-100	90-100	70-85	22-42	2-12
	9-38	Silt loam, loam, clay loam, silty clay loam	CL	A-6, A-7, A-7-6	0	0	100	90-100	80-95	70-85	35-60	25-35
	38-80	Loam, silt loam	CL, CL-ML	A-4, A-6	0	0	75-95	75-90	65-90	50-80	15-25	4-12
CeB2:												
Celina----------	0-8	Silt loam	ML	A-4	0	0	100	90-100	90-100	70-85	22-42	2-12
	8-28	Silt loam, loam, clay loam, silty clay loam	CL	A-6, A-7, A-7-6	0	0	100	90-100	80-95	70-85	35-60	25-35
	28-80	Loam, silt loam	CL, CL-ML	A-4, A-6	0	0	75-95	75-90	65-90	50-80	15-25	4-12
CoA:												
Corwin----------	0-11	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0-1	98-100	95-100	90-100	55-90	15-40	3-15
	11-38	Silt loam, clay loam, loam	CL, CL-ML	A-4, A-6, A-7-6	0	0-1	90-100	85-100	75-95	50-80	20-50	5-30
	38-80	Loam, silt loam	CL, ML, SC, SM	A-4, A-6	0-1	0-3	90-100	85-95	75-90	45-80	15-35	NP-15
CtA:												
Crosby----------	0-10	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	95-100	90-100	80-95	60-85	15-40	1-15
	10-25	Clay loam, silty clay loam, silty clay, clay	CH, CL	A-6, A-7-6	0-1	0-3	90-100	85-100	75-95	55-90	30-60	10-35
	25-39	Loam, clay loam	CL, ML, SC, SM	A-6, A-4	0-1	0-3	85-100	80-98	65-90	40-70	15-35	2-20
	39-80	Loam	CL, ML, SC, SM	A-4, A-6	0-1	0-3	85-100	80-98	65-90	40-70	15-35	2-20
Celina----------	0-8	Silt loam	ML	A-4	0	0	100	90-100	90-100	70-85	22-42	2-12
	8-34	Silt loam, loam, clay loam, silty clay loam	CL	A-6, A-7, A-7-6	0	0	100	90-100	80-95	70-85	35-60	25-35
	34-80	Loam, silt loam	CL, CL-ML	A-4, A-6	0	0	75-95	75-90	65-90	50-80	15-25	4-12
CtB:												
Crosby----------	0-7	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	95-100	90-100	80-95	60-85	15-40	1-15
	7-21	Clay loam, silty clay loam, silty clay, clay	CH, CL	A-6, A-7-6	0-1	0-3	90-100	85-100	75-95	55-90	36-56	25-32
	21-32	Loam, clay loam	CL, ML, SC, SM	A-6, A-4	0-1	0-3	85-100	80-98	65-90	40-70	15-35	1-20
	32-80	Loam	CL, ML, SC, SM	A-4, A-6	0-1	0-3	85-100	80-98	65-90	40-70	15-35	1-20
Celina----------	0-10	Silt loam	ML	A-4	0	0	100	90-100	90-100	70-85	22-42	2-12
	10-39	Silt loam, loam, clay loam, silty clay loam	CL	A-6, A-7, A-7-6	0	0	100	90-100	80-95	70-85	35-60	25-35
	39-80	Loam, silt loam	CL, CL-ML	A-4, A-6	0	0	75-95	75-90	65-90	50-80	15-25	4-12

Table 29.--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	
CvA:												
Crosby----------	0-9	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	95-100	90-100	80-95	60-85	15-40	1-15
	9-28	Clay loam, silty clay loam, silty clay, clay	CH, CL	A-6, A-7-6	0-1	0-3	90-100	85-100	75-95	55-90	36-56	25-32
	28-36	Loam, clay loam	SC, SM, CL, ML	A-6, A-4	0-1	0-3	85-100	80-98	65-90	40-70	15-35	2-20
	36-80	Loam	CL, ML, SC, SM	A-4, A-6	0-1	0-3	85-100	80-98	65-90	40-70	15-35	2-20
Lewisburg-------	0-7	Silt loam	ML, CL-ML	A-4, A-6	0	0-2	95-100	90-100	85-100	75-90	20-40	2-12
	7-19	Clay, clay loam, loam	CH, CL	A-6, A-7	0	0-2	90-100	85-95	80-95	65-85	35-60	25-35
	19-80	Loam, silt loam	CL, CL-ML	A-4, A-6	0	0-5	85-100	80-95	65-90	50-75	15-25	4-12
CyA:												
Cyclone---------	0-12	Silt loam	CL, ML	A-4, A-6	0	0	100	100	90-100	70-100	22-42	2-20
	12-50	Silty clay loam, clay loam	CL	A-4, A-6	0	0	100	100	90-100	80-95	33-45	9-21
	50-61	Clay loam, loam	CL	A-4, A-6	0	0	100	100	90-100	80-95	33-45	9-21
	61-80	Loam	CL-ML, ML	A-4	0	0	100	100	90-100	70-90	20-40	2-10
DaA:												
Dana----------	0-11	Silt loam	ML	A-4, A-6	0	0	100	100	95-100	85-95	28-38	6-12
	11-38	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-98	38-47	19-25
	38-55	Loam, clay loam	CL, CL-ML	A-7, A-6	0	0-3	90-100	90-95	80-90	65-75	22-42	2-20
	55-80	Loam	CL, CL-ML, SM	A-4, A-6	0-3	0-3	85-95	80-90	75-85	40-65	20-30	2-16
DaB:												
Dana----------	0-10	Silt loam	ML	A-4, A-6	0	0	100	100	95-100	85-95	28-47	6-12
	10-37	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-98	38-47	19-25
	37-48	Clay loam, loam	CL, CL-ML	A-6, A-7	0	0-3	90-100	90-95	80-90	35-55	22-42	2-20
	48-80	Loam	SM, CL, CL-ML	A-4, A-6	0-3	0-3	85-95	80-90	75-85	35-60	16-26	3-12
EeA:												
Eel----------	0-13	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	85-100	60-90	20-38	2-12
	13-37	Loam, silt loam, clay loam	CL, CL-ML	A-4, A-6	0	0	100	100	85-100	70-85	18-39	2-17
	37-48	Loam, clay loam, sandy loam	CL, CL-ML, SC, SC-SM	A-2-4, A-2-6, A-4, A-6	0	0	100	90-100	55-95	30-80	20-40	2-20
	48-80	Gravelly sandy loam, gravelly loam, gravelly fine sandy loam	GP-GM, SP-SM	A-1, A-2	0	0-15	30-70	20-50	5-40	0-35	24-30	NP-12
EgA:												
Eldean----------	0-4	Gravelly loam	CL-ML, GM, ML, SM	A-4, A-6	0	0-10	65-90	60-80	55-75	40-60	20-50	2-16
	4-24	Clay, gravelly clay loam, gravelly clay	CL, ML	A-6, A-7, A-7-6	0	0-5	80-100	48-100	43-100	35-86	35-55	10-30
	24-30	Very gravelly clay loam, very gravelly sandy loam, very gravelly loam, gravelly sandy loam, loam, sandy clay loam	CL, GC, SC	A-2, A-4, A-6, A-7	0	0-10	55-85	45-85	45-75	30-60	25-44	9-25
	30-80	Stratified very gravelly loamy coarse sand to gravelly coarse sandy loam	GM, GP-GM, SM, SP-SM	A-1, A-2	0	0-15	30-70	20-50	5-40	0-35	0-21	NP-4

Table 29.--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	
EgB:												
Eldean----------	0-4	Gravelly loam	GM, ML, SM, CL-ML	A-4, A-6	0	0-10	65-90	60-80	55-75	40-60	20-50	2-16
	4-22	Clay, gravelly clay loam, gravelly clay	CL, ML	A-6, A-7, A-7-6	0	0-5	80-100	48-100	43-100	35-86	35-55	10-30
	22-30	Very gravelly clay loam, very gravelly sandy loam, very gravelly loam, gravelly sandy loam, loam, sandy clay loam	CL, GC, SC	A-2, A-4, A-6, A-7	0	0-10	55-85	45-85	45-75	30-60	25-44	9-25
	30-80	Stratified very gravelly loamy coarse sand to gravelly coarse sandy loam	GM, GP-GM, SM, SP-SM	A-1, A-2	0	0-15	30-70	20-50	5-40	0-35	0-21	NP-4
EgB2:												
Eldean----------	0-4	Gravelly loam	GM, ML, SM, CL-ML	A-4, A-6	0	0-10	65-90	60-80	55-75	40-60	20-50	2-16
	4-20	Clay, gravelly clay loam, gravelly clay	CL, ML	A-6, A-7, A-7-6	0	0-5	80-100	48-100	43-100	35-86	35-55	10-30
	20-26	Very gravelly clay loam, very gravelly sandy loam, very gravelly loam, gravelly sandy loam, loam, sandy clay loam	CL, GC, SC	A-2, A-4, A-6, A-7	0	0-10	55-85	45-85	45-75	30-60	25-44	9-25
	26-80	Stratified very gravelly loamy coarse sand to gravelly coarse sandy loam	GM, GP-GM, SM, SP-SM	A-1, A-2	0	0-15	30-70	20-50	5-40	0-35	0-21	NP-4
EhC3:												
Eldean----------	0-5	Gravelly clay loam	CL-ML, GM, ML, SM	A-4, A-6	0	0-10	65-90	60-80	55-75	40-60	20-50	2-16
	5-16	Gravelly clay loam, gravelly clay	CL, ML	A-6, A-7	0	0-5	80-100	48-100	43-100	35-86	35-55	12-24
	16-22	Very gravelly clay loam, gravelly sandy loam, very gravelly loam, loam	CL, GC, SC	A-2, A-4, A-6, A-7	0	0-10	55-85	45-85	45-75	30-60	25-61	9-39
	22-80	Stratified very gravelly coarse sandy loam to extremely gravelly loamy coarse sand	GM, GP-GM, SM, SP-SM	A-1, A-2	0	0-15	30-70	20-50	5-40	0-35	0-21	NP-4

Table 29.--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	
EhD3:												
Eldean----------	0-5	Gravelly clay loam	CL-ML, GM, ML, SM	A-4, A-6	0	0-10	65-90	60-80	55-75	40-60	20-50	2-16
	5-28	Gravelly clay loam, gravelly clay	CL, ML	A-6, A-7	0	0-5	80-100	48-100	43-100	35-86	35-55	12-24
	28-35	Very gravelly clay loam, gravelly sandy loam, very gravelly loam, loam	CL, GC, SC	A-2, A-4, A-6, A-7	0	0-10	55-85	45-85	45-75	30-60	25-61	9-39
	35-80	Stratified very gravelly coarse sandy loam to extremely gravelly loamy coarse sand	GM, GP-GM, SM, SP-SM	A-1, A-2	0	0-15	30-70	20-50	5-40	0-35	0-21	NP-4
EkA:												
Eldean----------	0-9	Loam	CL, CL-ML, ML	A-4, A-6	0	0	85-100	80-100	70-100	55-90	20-45	2-20
	9-28	Clay loam, loam, clay, gravelly clay loam, gravelly clay, silt loam, silty clay loam	CL, ML	A-6, A-7	0	0-5	80-100	48-100	43-100	35-86	35-55	10-30
	28-36	Gravelly clay loam, very gravelly coarse sandy loam, gravelly loam, very gravelly loam	CL, GC, SC	A-4, A-2, A-6, A-7	0	0-10	55-85	45-85	45-75	30-60	26-45	9-25
	36-80	Stratified very gravelly coarse sandy loam to extremely gravelly loamy coarse sand	GM, GP-GM, SM, SP-SM	A-1, A-2	0	0-15	30-70	20-50	5-40	0-35	0-22	NP-4
EkB:												
Eldean----------	0-7	Loam	CL, CL-ML, ML	A-4, A-6	0	0	85-100	80-100	70-100	55-90	20-45	2-20
	7-28	Clay, clay loam, gravelly clay loam, gravelly clay	CL, ML	A-6, A-7	0	0-5	75-100	60-100	55-95	50-80	35-55	10-30
	28-34	Gravelly clay loam, gravelly sandy loam, gravelly loam, loam	CL, GC, SC	A-4, A-2, A-6, A-7	0	0-10	55-85	45-85	45-75	30-60	26-45	9-25
	34-80	Stratified very gravelly coarse sandy loam to extremely gravelly loamy coarse sand	GM, GP-GM, SM, SP-SM	A-1, A-2	0	0-15	30-70	20-50	5-40	0-35	0-22	NP-4

Table 29.--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	
EkB2:												
Eldean----------	0-5	Loam	CL, CL-ML, ML	A-4, A-6	0	0	85-100	80-100	70-100	55-90	20-45	2-20
	5-24	Clay, clay loam, gravelly clay loam, gravelly clay	CL, ML	A-6, A-7	0	0-5	80-100	48-100	43-100	35-86	35-55	10-30
	24-32	Gravelly clay loam, gravelly sandy loam, very gravelly loam, loam	CL, GC, SC	A-4, A-2, A-6, A-7	0	0-10	55-85	45-85	45-75	30-60	26-45	9-25
	32-80	Stratified very gravelly coarse sandy loam to extremely gravelly loamy coarse sand	GM, GP-GM, SM, SP-SM	A-1, A-2	0	0-15	30-70	20-50	5-40	0-35	0-22	NP-4
FcA:												
Fincastle-------	0-9	Silt loam	CL-ML, ML	A-4	0	0	100	95-100	90-100	75-93	22-42	2-20
	9-35	Silty clay loam, silt loam	CL	A-6	0	0	100	100	95-100	85-95	33-46	16-25
	35-46	Clay loam, loam, silty clay loam	CL, CL-ML	A-6	0	0-5	90-100	85-95	70-95	50-80	16-26	4-12
	46-80	Loam	CL, CL-ML	A-4, A-6	0	0-3	88-96	82-90	70-86	50-66	16-26	4-12
FdA:												
Fincastle-------	0-9	Silt loam	CL-ML, ML	A-4	0	0	100	95-100	90-100	75-93	22-42	2-20
	9-36	Silt loam, silty clay loam	CL	A-6	0	0	100	100	95-100	85-95	33-46	16-25
	36-43	Clay loam	CL, CL-ML	A-6	0	0-5	90-100	85-95	70-95	50-80	16-26	4-12
	43-63	Loam, flaggy loam	CL, CL-ML	A-4, A-6	0	0-3	88-96	82-90	70-86	50-66	16-26	4-12
	63-67	Weathered bedrock			---	---	---	---	---	---	---	---
FmA:												
Fox----------	0-10	Silt loam	CL, CL-ML, ML	A-4	0	0	95-100	95-100	85-95	65-90	16-36	2-12
	10-37	Clay loam, loam, gravelly loam, gravelly clay loam, gravelly sandy clay loam	CL, GC, SC	A-2, A-6, A-7	0	0-5	75-100	60-100	55-95	20-70	29-46	12-25
	37-64	Extremely gravelly loamy sand, very gravelly loamy sand, gravelly loamy sand, very gravelly sand	GP, GP-GM, SP, SP-SM	A-2, A-3, A-1	0-3	0-10	30-100	20-95	10-90	2-10	0-14	NP
	64-80	Loam	CL	A-6, A-7	0	0	95-100	95-100	85-95	50-75	29-46	12-25

Table 29.--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	
FmB:												
Fox----------	0-10	Silt loam	CL, CL-ML, ML	A-4	0	0	95-100	95-100	85-95	65-90	16-36	2-12
	10-37	Clay loam, loam, gravelly loam, gravelly clay loam, gravelly sandy clay loam, very gravelly sandy loam	CL, GC, SC	A-2, A-6, A-7	0	0-5	75-100	60-100	55-95	20-70	29-46	12-25
	37-65	Extremely gravelly loamy sand, very gravelly loamy sand, gravelly loamy sand, very gravelly sand	GP, GP-GM, SP, SP-SM	A-2, A-3, A-1	0-3	0-10	30-100	20-95	10-90	2-10	0-14	NP
	65-80	Loam	CL	A-6, A-7	0-1	0-5	95-100	95-100	85-95	50-75	29-46	12-25
FmB2:												
Fox----------	0-8	Silt loam	CL, CL-ML, ML	A-4	0	0	95-100	95-100	85-95	65-90	16-36	2-12
	8-38	Clay loam, loam, gravelly loam, gravelly clay loam	CL, GC, SC	A-2, A-6, A-7	0	0-5	75-100	60-100	55-95	20-70	29-46	12-25
	38-72	Extremely gravelly loamy sand, very gravelly loamy sand, gravelly loamy sand, very gravelly sand	GP, GP-GM, SP, SP-SM	A-2, A-3, A-1	0-3	0-10	30-100	20-95	10-90	2-10	0-14	NP
	72-80	Loam	CL	A-6, A-7	0-1	0-5	95-100	95-100	85-95	50-75	29-46	12-25
HeF2:												
Hennepin--------	0-4	Silt loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	36-49	17-25
	4-16	Clay loam, loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	35-46	17-25
	16-80	Loam	CL-ML	A-4, A-6	0	0-5	95-100	95-100	65-85	50-75	20-37	6-19
Miamian---------	0-4	Silt loam	CL-ML, ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	22-42	2-18
	4-19	Clay loam, silty clay loam	CL	A-6, A-7	0	0	85-100	80-100	75-95	70-85	36-47	17-25
	19-29	Clay loam, loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	38-58	25-35
	29-80	Loam, gravelly loam	CL-ML, ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	18-38	4-12
HwE2:												
Hennepin--------	0-4	Silt loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	36-49	17-25
	4-16	Clay loam, loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	35-46	17-25
	16-80	Loam	CL-ML	A-4, A-6	0	0-5	95-100	95-100	65-85	50-75	20-37	6-19
Wynn----------	0-5	Silt loam	CL-ML, ML	A-4, A-6	0	0	100	100	85-100	80-90	16-36	2-12
	5-30	Silty clay loam, clay, silty clay, clay loam	CH, CL	A-6, A-7	0	0	95-100	80-100	75-100	70-95	39-55	21-35
	30-33	Weathered bedrock			---	---	---	---	---	---	---	---
HwF2:												
Hennepin--------	0-4	Silt loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	36-49	17-25
	4-13	Clay loam, loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	35-46	17-25
	13-80	Loam	CL-ML	A-4, A-6	0	0-5	95-100	95-100	65-85	50-75	20-37	6-19
Wynn----------	0-4	Silt loam	CL-ML, ML	A-4, A-6	0	0	100	100	85-100	80-90	16-36	2-12
	4-24	Silty clay loam, clay loam, silty clay, clay	CH, CL	A-6, A-7	0	0	95-100	80-100	75-100	70-95	39-55	21-35
	24-27	Weathered bedrock			---	---	---	---	---	---	---	---

Table 29.--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	
KeC2:												
Kendallville----	0-5	Silt loam	ML	A-4, A-6	0	0-5	90-100	80-100	75-95	70-90	20-40	2-12
	5-30	Clay loam, gravelly clay loam	CL, CL-ML, GC, SC	A-4, A-6	0	0-5	70-100	60-95	50-80	45-75	20-35	2-20
	30-80	Loam	CL, CL-ML, ML	A-4, A-6	0	0-5	90-100	80-95	60-90	55-75	20-40	2-20
Eldean----------	0-5	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	85-100	80-100	70-100	55-90	20-45	2-20
	5-26	Clay, gravelly clay loam, clay loam	CL, ML	A-6, A-7	0	0-5	75-100	60-100	55-95	50-80	35-55	10-30
	26-80	Stratified gravelly loamy coarse sand to gravelly coarse sandy loam	GM, GP-GM, SM, SP-SM	A-1, A-2	0	0-15	30-70	20-50	5-40	0-35	0-22	NP-4
KeD2:												
Kendallville----	0-3	Silt loam	ML	A-4, A-6	0	0-5	90-100	80-100	75-95	70-90	20-40	2-12
	3-32	Clay loam, gravelly clay loam	CL, CL-ML, GC, SC	A-4, A-6	0	0-5	70-100	60-95	50-80	45-75	20-35	2-20
	32-80	Loam	CL, CL-ML, ML	A-4, A-6	0	0-5	90-100	80-95	60-90	55-75	20-40	2-20
Eldean----------	0-4	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	85-100	80-100	70-100	55-90	20-45	2-20
	4-33	Clay, gravelly clay loam, clay loam	CL, ML	A-6, A-7	0	0-5	75-100	60-100	55-95	50-80	35-55	10-30
	33-80	Stratified very gravelly loamy coarse sand to extremely gravelly coarse sandy loam	GM, GP-GM, SM, SP-SM	A-1, A-2	0	0-15	30-70	20-50	5-40	0-35	0-22	NP-4
KnA:												
Kokomo----------	0-10	Silt loam	CL	A-6	0	0	100	98-100	85-100	60-90	37-51	13-19
	10-50	Silty clay loam, clay loam, silty clay	CH, CL	A-6, A-7	0	0-1	95-100	95-100	95-100	75-95	38-58	21-32
	50-68	Silty clay loam, clay loam, silty clay, loam	CH, CL	A-6, A-7	0	0-1	95-100	95-100	95-100	75-95	38-58	21-32
	68-80	Loam	CL	A-6	0-1	0-3	90-100	85-95	75-90	55-70	24-39	9-21
KoA:												
Kokomo----------	0-11	Silty clay loam	CH, CL	A-6, A-7	0	0	100	98-100	85-95	75-85	38-58	18-24
	11-41	Silty clay loam, clay loam, silty clay	CH, CL	A-6, A-7	0	0-1	95-100	95-100	95-100	75-95	33-53	25-29
	41-64	Silty clay loam, clay loam, silty clay, loam	CH, CL	A-6, A-7	0	0-1	95-100	95-100	95-100	75-95	38-58	21-32
	64-80	Loam	CL	A-6	0-1	0-3	90-100	85-95	75-90	55-70	24-39	9-21
LeB:												
Lewisburg-------	0-9	Silt loam	CL-ML, ML	A-4, A-6	0	0-2	95-100	90-100	85-100	75-90	20-40	2-12
	9-19	Clay loam, clay, loam	CH, CL	A-6, A-7	0	0-2	90-100	85-95	80-95	65-85	35-60	25-35
	19-80	Loam, silt loam	CL, CL-ML	A-4, A-6	0	0-5	85-100	80-95	65-90	50-75	15-25	4-12

Table 29.--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	
Celina----------	0-9	Silt loam	ML	A-4	0	0	100	90-100	90-100	70-85	22-42	2-12
	9-34	Silt loam, loam, clay loam, silty clay loam	CL	A-6, A-7	0	0	100	90-100	80-95	70-85	35-60	25-35
	34-80	Loam, silt loam	CL-ML, CL	A-4, A-6	0	0	75-95	75-90	65-90	50-80	15-25	4-12
LfB2:												
Lewisburg-------	0-6	Clay loam	ML, CL-ML	A-4, A-6	0	0-2	95-100	90-100	85-100	75-90	20-40	2-12
	6-19	Clay loam, clay	CL, CH	A-7, A-6	0	0-2	90-100	85-95	80-95	65-85	35-60	25-35
	19-80	Loam, silt loam	CL, CL-ML	A-4, A-6	0	0-5	85-100	80-95	65-90	50-75	15-25	4-12
Celina----------	0-8	Clay loam	ML	A-4, A-6	0	0	100	90-100	90-100	70-85	31-54	8-28
	8-30	Silt loam, loam, clay loam, silty clay loam	CL	A-6, A-7	0	0	100	90-100	80-95	70-85	38-58	25-35
	30-80	Loam, silt loam	CL, CL-ML	A-4, A-6	0	0	75-95	75-90	65-90	50-80	15-25	4-12
LgC3:												
Lewisburg-------	0-4	Clay loam	CL-ML, ML	A-4, A-6	0	0-2	95-100	90-100	85-100	75-90	20-40	2-12
	4-19	Clay loam, clay	CH, CL	A-6, A-7	0	0-2	90-100	85-95	80-95	65-85	35-60	25-35
	19-80	Loam, silt loam	CL-ML, CL	A-4, A-6	0	0-5	85-100	80-95	65-90	50-75	15-25	4-12
LpA:												
Lippincott------	0-11	Silty clay loam	CL, ML	A-6, A-7	0	0	90-100	80-100	75-100	70-95	25-45	2-20
	11-25	Silty clay, clay loam, silty clay loam	CH, CL, MH, ML	A-6, A-7	0	0	90-100	80-100	75-100	60-95	20-60	3-20
	25-36	Very gravelly sandy loam, gravelly coarse sandy loam, very gravelly silt loam, gravelly clay loam, loam	GM, GP-GM, SM, SP-SM	A-2, A-1, A-6, A-4	0	0-10	40-65	20-55	10-50	5-40	17-47	2-24
	36-80	Very gravelly loamy sand, extremely gravelly sand, extremely gravelly loamy coarse sand	GP, GW, SM, SP	A-1	0	0-10	40-65	20-55	10-40	1-20	0-22	NP-6
MaA:												
Medway----------	0-12	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	85-100	70-90	20-50	2-25
	12-38	Loam, silt loam, clay loam, silty clay loam	CL, CL-ML, ML	A-4, A-6, A-7	0	0	95-100	80-95	75-90	70-90	20-50	2-25
	38-80	Stratified gravelly sandy loam to silt loam to silty clay loam, stratified gravelly loam to clay loam	CL, ML, SC, SM	A-1-b, A-2, A-4, A-6	0	0-5	80-100	50-100	30-95	15-75	17-40	2-21
MbB2:												
Miami----------	0-5	Silt loam	ML, CL, CL-ML	A-4, A-6	0	0	95-100	92-100	85-100	75-90	20-40	3-18
	5-23	Clay loam, silty clay loam	CL	A-6, A-7-6	0-1	0-5	90-100	85-98	75-95	55-85	37-46	19-25
	23-30	Clay loam, loam	CL, ML, SC, SM	A-4, A-6	0-1	0-5	90-98	85-98	65-95	40-70	24-39	3-20
	30-80	Loam, fine sandy loam, gravelly loam	CL, ML, SC, SM	A-6, A-4	0-1	0-5	90-98	85-98	65-90	40-70	20-32	3-13

Table 29.--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	
McE2:												
Miami----------	0-5	Silt loam	ML, CL, CL-ML	A-4, A-6	0	0	95-100	92-100	85-100	75-90	20-40	3-18
	5-22	Clay loam, silty clay loam	CL	A-6, A-7-6	0-1	0-5	90-100	85-98	75-95	55-85	37-46	19-25
	22-31	Loam, fine sandy loam	CL, ML, SC, SM	A-4, A-6	0-1	0-5	90-98	85-98	65-95	40-70	24-36	3-17
	31-80	Loam, fine sandy loam, gravelly loam	CL, ML, SC, SM	A-6, A-4	0-1	0-5	90-98	85-98	65-90	40-70	20-32	3-13
Kendallville----	0-5	Silt loam	ML	A-4, A-6	0	0-5	90-100	80-100	75-95	70-90	20-40	2-12
	5-31	Clay loam, gravelly clay loam	CL, CL-ML, GC, SC	A-4, A-6	0	0-5	70-100	60-95	50-80	45-75	20-35	2-20
	31-80	Loam	CL, CL-ML, ML	A-4, A-6	0	0-5	90-100	80-95	60-90	55-75	20-40	2-20
McF2:												
Miami----------	0-4	Silt loam	ML, CL, CL-ML	A-4, A-6	0	0	95-100	92-100	85-100	75-90	20-40	3-18
	4-10	Silty clay loam, silt loam	CL, CL-ML	A-4, A-6	0	0-1	95-100	92-100	85-98	75-90	25-45	5-25
	10-22	Clay loam, silty clay loam	CL	A-6, A-7-6	0-1	0-5	90-100	85-98	75-95	55-85	37-46	19-25
	22-28	Loam, fine sandy loam, clay loam	CL, ML, SC, SM	A-4, A-6	0-1	0-5	90-98	85-98	65-95	40-70	24-36	3-17
	28-80	Loam, fine sandy loam, gravelly loam	CL, ML, SC, SM	A-6, A-4	0-1	0-5	90-98	85-98	65-90	40-70	20-32	3-13
Kendallville----	0-4	Silt loam	ML	A-6, A-4	0	0-5	90-100	80-100	75-95	70-90	20-40	2-12
	4-40	Clay loam, silty clay loam, gravelly clay loam	CL, CL-ML, GC, SC	A-4, A-6	0	0-5	70-100	60-95	50-80	45-75	20-35	2-20
	40-80	Loam	CL, CL-ML, ML	A-4, A-6	0	0-5	90-100	80-95	60-90	55-75	20-40	2-20
MdC2:												
Miami----------	0-5	Loam	ML, CL, CL-ML	A-4, A-6	0	0	95-100	92-100	85-100	75-90	22-42	2-20
	5-20	Clay loam, silty clay loam	CL	A-6, A-7-6	0-1	0-5	90-100	85-98	75-95	55-85	37-46	19-25
	20-26	Loam, clay loam	CL, ML, SC, SM	A-4, A-6	0-1	0-5	90-98	85-98	65-95	40-70	29-40	3-21
	26-80	Loam, fine sandy loam, gravelly loam	CL, ML, SC, SM	A-6, A-4	0-1	0-5	75-95	75-90	65-85	40-70	20-32	3-13
MdD2:												
Miami----------	0-5	Loam	ML, CL, CL-ML	A-4, A-6	0	0	95-100	92-100	85-100	75-90	22-42	2-20
	5-24	Clay loam, silty clay loam	CL	A-6, A-7-6	0-1	0-5	90-100	85-98	75-95	55-85	37-46	19-25
	24-30	Loam, clay loam	CL, ML, SC, SM	A-4, A-6	0-1	0-5	90-98	85-98	65-95	40-70	29-40	3-21
	30-80	Loam, fine sandy loam, gravelly loam	CL, ML, SC, SM	A-6, A-4	0-1	0-5	90-98	85-98	65-90	40-70	20-32	3-13
MeC:												
Miamian---------	0-9	Silt loam	CL-ML, ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	20-45	2-20
	9-12	Clay, clay loam, silty clay loam	CL	A-6, A-7	0	0	85-100	80-100	75-95	70-85	36-47	17-25
	12-24	Clay loam, loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	38-58	25-35
	24-80	Loam, gravelly loam	CL-ML, ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	17-37	2-20

Table 29.--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	
MeC2:												
Miamian---------	0-6	Silt loam	ML, CL-ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	20-45	2-20
	6-18	Clay, clay loam, silty clay loam	CL	A-6, A-7	0	0	85-100	80-100	75-95	70-85	36-47	17-25
	18-29	Clay loam, loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	38-58	25-35
	29-80	Loam, gravelly loam	CL-ML, ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	17-37	2-20
MeD2:												
Miamian---------	0-6	Silt loam	ML, CL-ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	20-45	2-20
	6-22	Clay, clay loam, silty clay loam	CL	A-6, A-7	0	0	85-100	80-100	75-95	70-85	36-47	17-25
	22-27	Clay loam, loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	38-58	25-35
	27-80	Loam, gravelly loam	CL-ML, ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	17-37	2-20
MfB:												
Miamian---------	0-9	Silt loam	CL-ML, ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	20-45	2-20
	9-29	Clay, clay loam, silty clay loam	CL	A-6, A-7	0	0	85-100	80-100	75-95	70-85	36-47	17-25
	29-35	Clay loam, loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	38-58	25-35
	35-80	Loam, gravelly loam	CL-ML, ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	17-37	2-20
Celina----------	0-10	Silt loam	ML	A-4	0	0	100	90-100	90-100	70-85	22-42	2-12
	10-34	Silt loam, loam, clay loam, silty clay loam	CL	A-6, A-7	0	0	100	90-100	80-95	70-85	38-58	25-35
	34-80	Loam, silt loam	CL, CL-ML	A-4, A-6	0	0	75-95	75-90	65-90	50-80	15-25	4-12
MfB2:												
Miamian---------	0-9	Silt loam	ML, CL-ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	20-45	2-20
	9-24	Clay, clay loam, silty clay loam	CL	A-6, A-7	0	0	85-100	80-100	75-95	70-85	36-47	17-25
	24-36	Clay loam, loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	38-58	25-35
	36-80	Loam, gravelly loam	ML, CL-ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	17-37	2-20
Celina----------	0-9	Silt loam	ML	A-4	0	0	100	90-100	90-100	70-85	22-42	2-12
	9-33	Silt loam, loam, clay loam, silty clay loam	CL	A-6, A-7	0	0	100	90-100	80-95	70-85	38-58	25-35
	33-80	Loam, silt loam	CL, CL-ML	A-4, A-6	0	0	75-95	75-90	65-90	50-80	15-25	4-12
MgE2:												
Miamian---------	0-4	Silt loam	CL-ML, ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	20-45	2-20
	4-28	Clay, clay loam, silty clay loam	CL	A-6, A-7	0	0	85-100	80-100	75-95	70-85	36-47	17-25
	28-38	Clay loam, loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	38-58	25-35
	38-80	Loam, gravelly loam	CL-ML, ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	17-37	2-20
Kendallville----	0-4	Silt loam	ML	A-4, A-6	0	0-5	90-100	80-100	75-95	70-90	20-40	2-12
	4-29	Clay loam, gravelly clay loam	CL, CL-ML, GC, SC	A-4, A-6	0	0-5	70-100	60-95	50-80	45-75	20-35	2-20
	29-80	Loam	CL, CL-ML, ML	A-4, A-6	0	0-5	90-100	80-95	60-90	55-75	20-40	2-20
MgF2:												
Miamian---------	0-6	Silt loam	CL-ML, ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	20-45	2-20
	6-23	Clay, clay loam, silty clay loam	CL	A-6, A-7	0	0	85-100	80-100	75-95	70-85	36-47	17-25
	23-28	Clay loam, loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	38-58	25-35
	28-80	Loam, gravelly loam	CL-ML, ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	17-37	2-20

Table 29.--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	
Kendallville----	0-4	Silt loam	ML	A-6, A-4	0	0-5	90-100	80-100	75-95	70-90	20-40	2-12
	4-35	Clay loam, gravelly silty clay loam, gravelly clay loam	CL, CL-ML, GC, SC	A-4, A-6	0	0-5	70-100	60-95	50-80	45-75	20-35	2-20
	35-80	Loam	CL, CL-ML, ML	A-4, A-6	0	0-5	90-100	80-95	60-90	55-75	20-40	2-20
MhC3:												
Miamian---------	0-4	Clay loam	CL-ML, ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	20-45	2-20
	4-19	Clay, clay loam, silty clay loam	CL	A-6, A-7	0	0	85-100	80-100	75-95	70-85	36-47	17-25
	19-26	Clay loam, loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	38-58	25-35
	26-80	Loam, gravelly loam	ML, CL-ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	17-37	2-18
Losantville-----	0-3	Clay loam	CL, CL-ML, ML	A-4, A-6	0	0-2	90-100	85-100	80-95	50-85	22-42	2-20
	3-19	Loam, clay loam	CH, CL	A-7, A-7-6, A-6	0	0-2	90-100	80-98	75-95	55-80	35-55	25-32
	19-80	Loam	CL, ML, SM, SC	A-4, A-6	0	0-5	100	80-95	75-90	45-70	20-35	2-20
MhD3:												
Miamian---------	0-3	Clay loam	ML, CL-ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	20-45	2-20
	3-26	Clay, clay loam, silty clay loam	CL	A-6, A-7	0	0	85-100	80-100	75-95	70-85	36-47	17-25
	26-33	Clay loam, loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	38-58	25-35
	33-80	Loam, gravelly loam	CL-ML, ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	17-37	2-20
Losantville-----	0-3	Clay loam	CL, CL-ML, ML	A-4, A-6	0	0-2	90-100	85-100	80-95	50-85	22-42	2-20
	3-14	Loam, clay loam	CH, CL	A-7, A-7-6, A-6	0	0-2	90-100	80-98	75-95	55-80	35-55	25-32
	14-80	Loam	CL, SC, SM, ML	A-4, A-6	0	0-5	100	80-95	75-90	45-70	20-35	2-20
MmE2:												
Miamian---------	0-3	Silt loam	CL-ML, ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	20-45	2-20
	3-18	Clay, clay loam, silty clay loam	CL	A-6, A-7	0	0	85-100	80-100	75-95	70-85	36-47	17-25
	18-26	Clay loam, loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	38-58	25-35
	26-80	Loam, gravelly loam	CL-ML, ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	17-37	2-20
Hennepin--------	0-4	Silt loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	36-49	17-25
	4-19	Clay loam, loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	35-46	17-25
	19-80	Loam, gravelly loam	CL-ML	A-4, A-6	0	0-5	95-100	95-100	65-85	50-75	20-37	6-19
MnE3:												
Miamian---------	0-3	Clay loam	CL-ML, ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	20-45	2-20
	3-18	Clay, clay loam, silty clay loam	CL	A-6, A-7	0	0	85-100	80-100	75-95	70-85	36-47	17-25
	18-26	Clay loam, loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	38-58	25-35
	26-80	Loam, gravelly loam	CL-ML, ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	17-37	2-20
Hennepin--------	0-4	Clay loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	36-49	17-25
	4-18	Clay loam, loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	35-46	17-25
	18-80	Loam, gravelly loam	CL-ML	A-4, A-6	0	0-5	95-100	95-100	65-85	50-75	20-37	6-19

Table 29.--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	
MpA:												
Milford---------	0-10	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-95	35-60	21-27
	10-34	Silty clay loam, clay loam, silty clay	CL	A-7	0	0	100	95-100	85-100	60-95	44-59	25-33
	34-46	Silty clay loam, clay loam, silty clay, silt loam	CL	A-7	0	0	100	95-100	85-100	60-95	44-57	25-30
	46-80	Stratified silt loam to silty clay loam	CL, CL-ML	A-4, A-6	0	0	95-100	90-100	50-95	50-80	21-41	2-20
MrA:												
Milford---------	0-11	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-95	35-60	21-27
	11-24	Silty clay loam, clay loam, silty clay	CL	A-7	0	0	100	95-100	85-100	60-95	44-59	25-33
	24-46	Silty clay loam, clay loam, silty clay, silt loam	CL	A-7	0	0	100	95-100	85-100	60-95	44-57	25-30
	46-73	Silt loam, fine sandy loam, very gravelly loamy sand, stratified sandy loam to loamy sand to silty clay loam	CL, CL-ML	A-4, A-6	0	0	95-100	90-100	50-95	50-80	0-40	NP-20
	73-80	Very gravelly loamy sand, gravelly loamy sand	GP, GP-GM, SP, SP-SM	A-2, A-3, A-1	0-3	0-10	30-100	20-95	10-90	2-10	0-14	NP
MsA:												
Millsdale-------	0-16	Silt loam	CL	A-6, A-7	0	0	90-100	80-100	75-100	70-95	38-58	15-30
	16-25	Silty clay, clay, clay loam	CH, CL	A-7	0	0-5	85-100	80-100	75-100	60-95	46-59	25-33
	25-32	Unweathered bedrock			---	---	---	---	---	---	---	---
MtA:												
Millsdale-------	0-14	Silty clay loam	CL	A-6, A-7	0	0	90-100	80-100	75-100	70-95	35-60	18-22
	14-30	Silty clay, clay, clay loam	CH, CL	A-7	0	0-5	85-100	80-100	75-100	60-95	46-59	25-33
	30-38	Unweathered bedrock			---	---	---	---	---	---	---	---
MuA:												
Milton----------	0-9	Silt loam	CL-ML, ML	A-4, A-6	0	0	95-100	90-100	85-100	70-95	16-26	3-13
	9-31	Clay loam, loam, clay, silty clay	CL	A-6, A-7	0	0	95-100	80-100	75-100	70-95	35-54	17-32
	31-60	Unweathered bedrock			---	---	---	---	---	---	---	---
MuB:												
Milton----------	0-9	Silt loam	CL-ML, ML	A-4, A-6	0	0	95-100	90-100	85-100	70-95	16-26	3-13
	9-28	Clay loam, loam, clay, silty clay	CL	A-6, A-7	0	0	95-100	80-100	75-100	70-95	35-54	17-32
	28-60	Unweathered bedrock			---	---	---	---	---	---	---	---

Table 29.--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	
MuB2:												
Milton----------	0-5	Silt loam	CL, ML	A-4, A-6	0	0	95-100	90-100	85-100	70-95	26-46	8-18
	5-24	Clay loam, clay, silty clay	CL	A-6, A-7	0	0	95-100	80-100	75-100	70-95	35-60	25-36
	24-28	Clay, loam, clay loam	CH, CL	A-6, A-7	0	0-5	95-100	80-100	70-95	50-90	35-54	17-32
	28-35	Unweathered bedrock			---	---	---	---	---	---	---	---
MuC2:												
Milton----------	0-3	Silt loam	CL, ML	A-4, A-6	0	0	95-100	90-100	85-100	70-95	26-46	8-18
	3-25	Clay loam, clay, silty clay	CL	A-6, A-7	0	0	95-100	80-100	75-100	70-95	38-58	25-35
	25-28	Clay loam, loam	CH, CL	A-6, A-7	0	0-5	95-100	80-100	70-95	50-90	35-54	17-32
	28-35	Unweathered bedrock			---	---	---	---	---	---	---	---
MuD2:												
Milton----------	0-5	Silt loam	CL, ML	A-4, A-6	0	0	95-100	90-100	85-100	70-95	26-46	8-18
	5-25	Silty clay loam, clay loam, clay	CL	A-6, A-7	0	0	95-100	80-100	75-100	70-95	38-58	25-35
	25-29	Loam, clay loam	CH, CL	A-6, A-7	0	0-5	95-100	80-100	70-95	50-90	35-54	17-32
	29-36	Unweathered bedrock			---	---	---	---	---	---	---	---
MuE2:												
Milton----------	0-4	Silt loam	CL, ML	A-4, A-6	0	0	95-100	90-100	85-100	70-95	26-46	8-18
	4-16	Clay loam, clay	CL	A-6, A-7	0	0	95-100	80-100	75-100	70-95	38-58	25-35
	16-23	Loam, clay, clay loam	CH, CL	A-6, A-7	0	0-5	95-100	80-100	70-95	50-90	35-54	17-32
	23-35	Unweathered bedrock			---	---	---	---	---	---	---	---
MwA:												
Morningsun------	0-10	Silt loam	ML	A-4, A-6, A-7	0	0	100	100	95-100	95-100	27-43	2-14
	10-33	Silt loam, silty clay loam	ML	A-4, A-6	0	0	100	100	100	95-100	30-41	2-14
	33-42	Silt loam, loam, clay loam	ML	A-4, A-6	0	0	100	100	100	95-100	30-41	2-14
	42-51	Sandy loam, loam, clay loam, gravelly loam, sandy loam, gravelly loam, gravelly clay loam	CL, ML	A-6, A-7	0-1	0-5	80-100	50-100	45-90	27-70	25-55	8-18
	51-80	Loam, sandy loam, gravelly sandy loam, stratified gravelly loam to sandy loam to loamy sand	CL, CL-ML	A-4, A-6	0-1	0-5	80-100	50-100	45-90	27-70	22-42	6-18

Table 29.--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	
MxA:												
Morningsun------	0-11	Silt loam	ML	A-4, A-6, A-7	0	0	100	100	95-100	95-100	27-43	2-14
	11-38	Silt loam, silty clay loam	ML	A-4, A-6	0	0	100	100	100	95-100	30-41	2-14
	38-45	Silt loam, loam, clay loam	ML	A-4, A-6	0	0	100	100	100	95-100	30-41	2-14
	45-58	Sandy loam, loam, clay loam, gravelly sandy loam, gravelly loam, gravelly clay loam	CL, ML	A-6, A-7	0-1	0-5	80-100	50-100	45-90	27-70	25-55	8-18
	58-80	Loam, sandy loam, gravelly loam, gravelly sandy loam, stratified gravelly loam to sandy loam to loamy sand	CL, CL-ML	A-4, A-6	0-1	0-5	80-100	50-100	45-90	27-70	22-42	6-18
Xenia----------	0-9	Silt loam	ML, CL-ML	A-4, A-6	0	0	100	100	90-100	70-90	20-35	2-12
	9-30	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	95-100	85-95	37-47	19-25
	30-45	Silt loam, clay loam, loam	CL-ML, CL	A-6, A-7	0	0-5	90-100	85-95	70-95	50-80	25-45	4-20
	45-80	Loam	CL, CL-ML	A-4, A-6	0	0-5	90-95	85-95	65-95	50-75	22-36	7-19
MxB:												
Morningsun------	0-10	Silt loam	ML	A-4, A-6, A-7	0	0	100	100	95-100	95-100	27-43	2-14
	10-34	Silt loam, silty clay loam	ML	A-4, A-6	0	0	100	100	100	95-100	30-41	2-14
	34-48	Sandy loam, loam, clay loam, gravelly sandy loam, gravelly loam, gravelly clay loam	CL, ML	A-6, A-7	0-1	0-5	80-100	50-100	45-90	27-70	25-55	8-18
	48-80	Loam, sandy loam, gravelly loam, gravelly sandy loam, stratified gravelly loam to sandy loam to loamy sand	CL, CL-ML	A-4, A-6	0-1	0-5	80-100	50-100	45-90	27-70	22-42	6-18
Xenia----------	0-9	Silt loam	ML, CL-ML	A-4, A-6	0	0	100	100	90-100	70-90	20-35	2-12
	9-30	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	95-100	85-95	37-47	19-25
	30-50	Silt loam, clay loam, loam	CL, CL-ML	A-6, A-7	0	0-5	90-100	85-95	70-95	50-80	25-45	4-20
	50-80	Loam	CL-ML, CL	A-4, A-6	0	0-5	90-95	85-95	65-95	50-75	22-36	7-19

Table 29.--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	
MxB2:												
Morningsun------	0-6	Silt loam	ML	A-4, A-6, A-7	0	0	100	100	95-100	95-100	27-43	2-14
	6-26	Silt loam, silty clay loam	ML	A-4, A-6	0	0	100	100	100	95-100	30-41	2-14
	26-31	Silt loam, loam, clay loam	ML	A-4, A-6	0	0	100	100	100	95-100	30-41	2-14
	31-50	Sandy loam, loam, clay loam, gravelly sandy loam, gravelly loam, gravelly clay loam	CL, ML	A-6, A-7	0-1	0-5	80-100	50-100	45-90	27-70	25-55	8-18
	50-80	Loam, sandy loam, gravelly loam, gravelly sandy loam, stratified gravelly loam to sandy loam to loamy sand	CL, CL-ML	A-4, A-6	0-1	0-5	80-100	50-100	45-90	27-70	22-42	6-18
Xenia----------	0-5	Silt loam	CL-ML, ML	A-4, A-6	0	0	100	100	90-100	70-90	20-35	2-12
	5-28	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-95	37-47	19-25
	28-45	Silt loam, clay loam, loam	CL-ML, CL	A-6, A-7	0	0-5	90-100	85-95	70-95	50-80	25-45	4-20
	45-80	Loam	CL-ML, CL	A-4, A-6	0	0-5	90-95	85-95	65-95	50-75	22-36	7-19
MyA:												
Mahalasville----	0-12	Silt loam	CH, CL, ML	A-6, A-7-6	0	0	100	100	95-100	85-100	35-55	10-30
	12-39	Silty clay loam, silt loam	CH, CL	A-7-6	0	0	100	100	95-100	90-100	40-55	20-40
	39-44	Sandy loam, loam, silt loam	CL, CL-ML, SC, SC-SM	A-6, A-7	0-1	0	85-100	75-98	55-90	40-65	20-60	5-30
	44-80	Silt loam, loam, gravelly sand, gravelly sandy loam, gravelly loam, stratified sand to silt loam	SM, SP-SM	A-2-4	0-1	0	85-100	75-100	40-60	10-60	0-0	NP
OcA:												
Ockley----------	0-9	Silt loam	CL-ML, ML	A-4	0	0	95-100	85-100	70-100	50-90	22-42	2-20
	9-48	Clay loam, sandy clay loam, gravelly sandy clay loam	CL, SC	A-2, A-4, A-6	0	0-2	75-100	60-100	55-95	20-70	35-45	9-29
	48-80	Stratified very gravelly sand to gravelly loamy sand	GP-GM, SP	A-1	0	1-5	30-70	20-55	10-40	2-10	0-19	NP-3
OcB:												
Ockley----------	0-9	Silt loam	CL-ML, ML	A-4	0	0	95-100	85-100	70-100	50-90	22-42	2-20
	9-50	Clay loam, sandy clay loam, gravelly sandy clay loam, gravelly clay loam	CL, SC	A-2, A-4, A-6	0	0-2	75-100	60-100	55-95	20-70	35-45	9-29
	50-80	Stratified very gravelly sand to very gravelly loamy sand	GP-GM, SP	A-1	0	1-5	30-70	20-55	10-40	2-10	0-19	NP-3
Pg:												
Pits, Gravel----	---	---	---	---	---	---	---	---	---	---	---	---

Table 29.--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	
Pq:												
Pits, Quarry----	---	---	---	---	---	---	---	---	---	---	---	---
PtB:												
Plattville------	0-18	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0-1	98-100	95-100	90-100	55-90	22-42	2-20
	18-43	Clay loam, loam, silty clay loam	CL, CL-ML	A-4, A-6, A-7-6	0	0-1	90-100	85-100	75-95	50-80	25-45	4-20
	43-54	Loam, clay loam, clay	CL, ML, SC, SM	A-4, A-6	0-1	0-3	90-100	85-95	75-90	45-80	20-35	2-20
	54-57	Unweathered bedrock			---	---	---	---	---	---	---	---
RaA:												
Rainsville------	0-8	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	90-100	75-90	20-41	3-17
	8-15	Silty clay loam, silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	75-90	24-44	4-24
	15-35	Clay loam, loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0-1	85-100	75-98	55-90	40-65	24-44	6-18
	35-55	Clay loam, sandy clay loam, loam	CL, CL-ML, SC, SC-SM	A-6, A-2-6	0	0-1	85-100	75-98	45-90	20-60	24-44	6-18
	55-80	Loam, gravelly sandy loam, gravelly loam	CL, CL-ML, SC, SM	A-4, A-6	0-1	0-3	90-100	85-98	65-90	40-70	24-33	3-15
RaB:												
Rainsville------	0-10	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	90-100	75-90	20-41	3-17
	10-16	Silty clay loam, silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	75-90	24-44	4-24
	16-44	Loam, clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0-1	85-100	75-98	55-90	40-65	24-44	6-18
	44-50	Clay loam, loam	CL, CL-ML, SC, SC-SM	A-6, A-2-6	0	0-1	85-100	75-98	45-90	20-60	24-44	6-18
	50-80	Loam, gravelly sandy loam, gravelly loam	CL, CL-ML, SC, SM	A-4, A-6	0-1	0-3	90-100	85-98	65-90	40-70	24-33	3-15
RaB2:												
Rainsville------	0-6	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	90-100	75-90	20-41	3-17
	6-36	Clay loam, loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0-1	85-100	75-98	55-90	40-65	24-44	4-24
	36-52	Clay loam, gravelly clay loam, loam	CL, CL-ML, SC, SC-SM	A-6, A-2-6	0	0-1	85-100	75-98	45-90	20-60	24-44	6-18
	52-80	Loam, gravelly sandy loam, gravelly loam	CL, CL-ML, SC, SM	A-4, A-6	0-1	0-3	90-100	85-98	65-90	40-70	24-33	3-15
RcA:												
Randolph--------	0-10	Silt loam	CL-ML, ML	A-4, A-6	0	0	95-100	95-100	90-100	75-85	20-38	2-12
	10-27	Silty clay, clay loam, silty clay loam	CH, CL	A-6, A-7	0	0-5	75-95	75-95	75-85	70-80	35-60	25-36
	27-33	Clay, clay loam, silty clay loam, gravelly clay loam	CL, GC, SC	A-2, A-4, A-6	0	0-5	75-95	75-95	75-85	35-80	27-44	8-18
	33-35	Unweathered bedrock			---	---	---	---	---	---	---	---

Table 29.--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	
RcB:												
Randolph--------	0-8	Silt loam	CL, CL-ML	A-4, A-6	0	0	95-100	95-100	90-100	75-85	20-38	2-12
	8-23	Silty clay, clay loam, silty clay loam, clay	CH, CL	A-6, A-7	0	0-5	75-95	75-95	75-85	70-80	35-60	25-36
	23-32	Gravelly clay loam, clay loam	CL, GC, SC	A-2, A-4, A-6	0	0-5	75-95	75-95	75-85	35-80	27-44	8-18
	32-35	Unweathered bedrock			---	---	---	---	---	---	---	---
RnE2:												
Rodman----------	0-8	Gravelly loam	CL, ML, SC, SM	A-4	0	0-2	70-85	65-75	60-75	36-65	23-43	2-20
	8-12	Gravelly loam, sandy loam, loam, gravelly sandy loam	CL, ML, SC, SM	A-1, A-2, A-4	0	0-2	70-85	60-85	40-75	20-55	16-39	2-17
	12-80	Extremely gravelly loamy coarse sand, extremely gravelly sandy loam, very gravelly sandy loam, extremely gravelly loamy sand, stratified extremely gravelly coarse sand to sand	GP, GP-GM, SP, SP-SM	A-1	0-1	1-5	30-70	20-55	7-20	2-10	0-24	NP-6
RnF2:												
Rodman----------	0-4	Gravelly loam	CL, ML, SC, SM	A-4	0	0-2	70-85	65-75	60-75	36-65	23-43	2-20
	4-12	Gravelly loam, sandy loam, loam, gravelly sandy loam, very gravelly loam	CL, ML, SC, SM	A-1, A-2, A-4	0	0-2	70-85	60-85	40-75	20-55	16-39	2-17
	12-80	Extremely gravelly loamy coarse sand, extremely gravelly loamy sand, extremely gravelly sandy loam, very gravelly sandy loam, stratified extremely gravelly coarse sand to sand	GP, GP-GM, SP, SP-SM	A-1	0-1	1-5	30-70	20-55	7-20	2-10	0-24	NP-6

Table 29.--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	
RoE2:												
Rodman----------	0-8	Gravelly loam	CL, ML, SC, SM	A-4	0	0-2	70-85	65-75	60-75	36-65	23-43	2-20
	8-12	Gravelly loam, sandy loam, loam, gravelly sandy loam, very gravelly loam	CL, ML, SC, SM	A-1, A-2, A-4	0	0-2	70-85	60-85	40-75	20-55	16-39	2-17
	12-80	Very gravelly sandy loam, extremely gravelly loamy sand, extremely gravelly sandy loam, stratified extremely gravelly coarse sand to sand	SP-SM, GP, GP-GM, SP	A-1	0-1	1-5	30-70	20-55	7-20	2-10	0-24	NP-6
Kendallville----	0-12	Loam	ML	A-4, A-6	0	0-5	90-100	80-100	75-95	70-90	20-40	2-12
	12-49	Clay loam, gravelly clay loam	CL, CL-ML, GC, SC	A-4, A-6	0	0-5	70-100	60-95	50-80	45-75	20-35	2-20
	49-80	Loam	CL, CL-ML, ML	A-4, A-6	0	0-5	90-100	80-95	60-90	55-75	20-40	2-20
RoF2:												
Rodman----------	0-4	Gravelly loam	CL, ML, SC, SM	A-4	0	0-2	70-85	65-75	60-75	36-65	23-43	2-20
	4-12	Gravelly loam, sandy loam, loam, gravelly sandy loam, very gravelly loam	CL, ML, SC, SM	A-1, A-2, A-4	0	0-2	70-85	60-85	40-75	20-55	16-39	2-17
	12-80	Extremely gravelly loamy sand, stratified extremely gravelly coarse sand to sand, stratified very gravelly loamy coarse sand to extremely gravelly loamy coarse sand to very gravelly sandy loam	GP, GP-GM, SP, SP-SM	A-1	0-1	1-5	30-70	20-55	7-20	2-10	0-24	NP-6
Kendallville----	0-7	Loam	ML	A-4, A-6	0	0-5	90-100	80-100	75-95	70-90	20-40	2-12
	7-40	Clay loam, gravelly clay loam	CL, CL-ML, GC, SC	A-4, A-6	0	0-5	70-100	60-95	50-80	45-75	20-35	2-20
	40-80	Loam	CL, CL-ML, ML	A-4, A-6	0	0-5	90-100	80-95	60-90	55-75	20-40	2-20

Table 29.--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	
RpA:												
Rossburg---------	0-18	Silt loam	CL-ML, CL	A-4, A-6	0	0	95-100	90-100	80-100	60-90	20-35	5-15
	18-35	Silt loam, loam, fine sandy loam, sandy loam	CL, CL-ML	A-4, A-6	0	0	90-100	85-100	70-95	50-80	20-35	5-15
	35-52	Gravelly loam, very gravelly sandy loam, loam, gravelly sandy loam, fine sandy loam, loamy sand, sandy loam, gravelly loamy sand, silt loam	SM, CL, CL-ML, ML	A-2-4, A-4	0	0	85-100	75-100	60-90	20-70	17-31	2-10
	52-80	Sand, gravelly sand, very gravelly sand, extremely gravelly sand	SP, SP-SM, SM	A-2, A-3	0	0	55-90	50-90	20-60	3-15	0-20	NP-6
RuB:												
Russell---------	0-8	Silt loam	CL-ML, ML	A-4, A-6	0	0	100	100	90-100	70-90	20-35	2-16
	8-35	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	95-100	85-95	36-47	17-25
	35-58	Clay loam, loam, silty clay loam	CL	A-6, A-7	0	0	95-100	90-95	80-90	60-80	33-47	16-25
	58-80	Loam, gravelly loam	CL, CL-ML	A-4, A-6	0	0-5	70-90	65-85	60-75	50-65	20-30	4-12
Miamian---------	0-5	Silt loam	ML, CL-ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	20-45	2-20
	5-10	Silt loam, clay loam, silty clay loam	CL	A-6, A-7	0	0	85-100	80-100	75-95	70-85	36-47	17-25
	10-32	Clay loam, loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	38-58	25-35
	32-80	Loam, gravelly loam	ML, CL-ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	17-37	2-20
RuB2:												
Russell---------	0-6	Silt loam	ML, CL-ML	A-4, A-6	0	0	100	100	90-100	70-90	20-35	2-16
	6-32	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	95-100	85-95	36-47	17-25
	32-50	Clay loam, loam, silty clay loam	CL	A-6, A-7	0	0	95-100	90-95	80-90	60-80	33-47	16-25
	50-80	Loam, gravelly loam	CL, CL-ML	A-4, A-6	0	0-3	85-95	80-90	75-85	50-65	20-30	4-12
Miamian---------	0-4	Silt loam	CL-ML, ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	20-45	2-20
	4-26	Clay loam, silty clay loam	CL	A-6, A-7	0	0	85-100	80-100	75-95	70-85	36-47	17-25
	26-33	Clay loam, loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	38-58	25-35
	33-80	Loam, gravelly loam	CL-ML, ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	17-37	2-20

Table 29.--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	
SeA:												
Savona----------	0-7	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	95-100	95-100	90-100	75-90	20-30	2-16
	7-29	Clay loam, clay, silty clay loam, gravelly clay, gravelly clay loam, silt loam	CH, CL	A-6, A-7	0	0-5	75-100	65-90	60-80	45-75	32-52	25-30
	29-45	Gravelly loam, gravelly silt loam, gravelly sandy loam, very gravelly loam, very gravelly silt loam, very gravelly sandy loam	CL, GC, SC	A-2, A-4, A-6, A-7	0	0-10	65-80	50-75	40-70	25-55	24-52	9-32
	45-80	Very gravelly loamy coarse sand, very gravelly coarse sand, very gravelly sand	SP, SP-SM	A-1	0	5-25	30-70	20-60	10-40	2-10	0-0	NP-3
SnA:												
Sloan----------	0-10	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	95-100	85-100	70-95	25-45	4-18
	10-45	Silty clay loam, clay loam, silt loam, loam	CL, CL-ML, ML	A-4, A-6, A-7	0	0	100	90-100	85-100	75-95	25-45	4-18
	45-60	Gravelly sandy loam, clay loam, gravelly loam, loam	CL, ML, SM	A-4, A-6	0	0-5	74-100	31-100	21-85	11-55	21-41	2-20
	60-80	Sand, gravelly sand, very gravelly loamy coarse sand, loamy sand	SM, SP, SP-SM	A-3, A-2	0	0-5	55-90	50-90	20-60	3-15	0-20	NP-6
StA:												
Stonelick-------	0-10	Loam	CL-ML, ML	A-4	0	0	90-100	80-100	65-95	50-75	21-36	2-12
	10-30	Loamy sand, sandy loam, fine sandy loam, loam	SC-SM, SM, SP-SM	A-2-4, A-4	0	0	90-100	80-100	50-80	10-50	16-29	2-12
	30-80	Very gravelly loamy sand, gravelly loamy coarse sand, gravelly loamy sand, gravelly sand	GP, GP-GM, SP, SP-SM	A-1	0	0-5	30-70	20-55	10-25	2-10	15-22	1-6

Table 29.--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	
SvA:												
Sugarvalley-----	0-10	Silt loam	CL-ML, ML	A-4	0	0	100	90-100	90-100	85-100	22-42	2-18
	10-41	Silty clay loam, silt loam	CL, CL-ML	A-4, A-6, A-7	0	0	100	90-100	90-100	90-100	24-44	2-20
	41-51	Silt loam, loam, clay loam	ML	A-4, A-6	0	0	100	100	100	95-100	30-41	2-14
	51-61	Sandy loam, loam, clay loam, gravelly sandy loam, gravelly loam, gravelly clay loam	CL, ML	A-6, A-7	0	0-5	80-100	50-100	45-90	27-70	25-55	8-18
	61-80	Gravelly loam, gravelly sandy loam, gravelly silt loam, sandy loam, loam, stratified silt loam to clay loam to loamy sand	CL-ML, ML	A-4, A-6	0	0-5	80-100	50-100	45-90	27-70	22-35	2-16
SwA:												
Sugarvalley-----	0-9	Silt loam	CL-ML, ML	A-4	0	0	100	90-100	90-100	85-100	22-42	2-18
	9-30	Silty clay loam, silt loam	CL, CL-ML	A-4, A-6, A-7	0	0	100	90-100	90-100	90-100	24-44	2-20
	30-50	Silt loam, loam, clay loam	ML	A-4, A-6	0	0	100	100	100	95-100	30-41	2-14
	50-80	Sandy loam, loam, gravelly loam, gravelly sandy loam, gravelly silt loam, stratified silt loam to clay loam to loamy sand	CL-ML, ML	A-4, A-6	0	0	90-100	85-95	80-90	70-90	22-35	2-16
Fincastle-------	0-11	Silt loam	CL, CL-ML, ML	A-4	0	0	100	95-100	90-100	75-93	22-42	2-20
	11-32	Silty clay loam, silt loam	CL	A-6	0	0	100	100	95-100	85-95	33-46	16-25
	32-48	Clay loam, loam, silty clay loam	CL	A-6	0	0	95-100	90-98	85-95	75-85	16-26	4-12
	48-80	Loam	CL	A-4, A-6	0	0-3	88-96	82-90	70-86	50-66	16-26	4-12
ThA:												
Thackery--------	0-12	Silt loam	CL-ML, ML	A-4, A-6	0	0	100	90-100	85-100	70-90	22-42	2-16
	12-21	Silt loam, silty clay loam	CL, CL-ML, ML	A-4, A-6	0	0	100	90-100	80-95	65-90	22-42	2-16
	21-54	Clay loam, sandy clay loam, gravelly clay loam	CL, SC	A-4, A-6	0	0-2	80-100	75-95	70-85	45-75	35-41	8-18
	54-80	Gravelly loamy coarse sand, very gravelly loamy coarse sand, gravelly loamy sand	GM, GW	A-1	0	0-5	25-55	15-45	10-35	2-25	0-24	NP-7

Table 29.--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	
ThB:												
Thackery--------	0-12	Silt loam	CL-ML, ML	A-4, A-6	0	0	100	90-100	85-100	70-90	22-42	2-16
	12-67	Clay loam, sandy clay loam, gravelly clay loam	CL, SC	A-4, A-6	0	0-2	80-100	75-95	70-85	45-75	35-41	8-18
	67-80	Gravelly loamy coarse sand, very gravelly loamy coarse sand, gravelly loamy sand	GM, GW	A-1	0	0-5	25-55	15-45	10-35	2-25	0-24	NP-7
Ud:												
Udorthents------	---	---	---	---	---	---	---	---	---	---	---	---
W:												
Water----------	---	---	---	---	---	---	---	---	---	---	---	---
WbA:												
Warsaw----------	0-12	Loam	CL, CL-ML	A-4, A-6	0	0	85-100	85-100	70-100	50-90	25-45	4-18
	12-21	Silty clay loam, loam, clay loam	CL, CL-ML, SC, SC-SM	A-2-4, A-2-6, A-4, A-6	0	0-3	90-100	85-100	60-90	30-70	25-45	4-22
	21-30	Gravelly sandy clay loam, gravelly clay loam	CL, GC, SC, SC-SM	A-2-4, A-2-6, A-4, A-6	0	0-5	70-90	60-85	55-70	30-60	28-43	9-17
	30-80	Stratified very gravelly coarse sand to sand, stratified gravelly coarse sand to very gravelly loamy coarse sand	GP, GP-GM, SP, SP-SM	A-1	0	1-5	30-70	22-55	7-20	2-10	0-22	NP-4
WnA:												
Westland--------	0-12	Silt loam	CH, CL, MH, ML	A-6, A-7-6	0	0	90-100	90-100	85-100	75-95	32-52	6-32
	12-20	Clay loam, loam, silty clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0-5	95-100	95-100	25-85	15-70	22-42	4-20
	20-51	Gravelly sandy loam, gravelly loam, gravelly clay loam, clay loam, gravelly sandy clay loam, sandy clay loam	CL, ML, SC, SM	A-2-4, A-4, A-6	0	0-5	55-100	45-95	25-85	15-70	17-47	2-24
	51-80	Gravelly coarse sand, stratified gravelly loamy coarse sand to very gravelly loamy coarse sand	GP, GP-GM, SP, SP-SM	A-1, A-1-b	0	0-12	40-75	35-70	10-45	0-10	0-23	NP-6
WyB:												
Wynn----------	0-8	Silt loam	CL-ML, ML	A-4, A-6	0	0	100	100	85-100	80-90	16-36	2-12
	8-14	Silty clay loam	CH, CL	A-6, A-7	0	0	95-100	80-100	75-100	70-95	39-55	21-35
	14-31	Clay, clay loam, silty clay loam, silty clay	CH, CL	A-6, A-7	0	0	95-100	80-100	75-100	70-95	40-60	21-35
	31-35	Weathered bedrock			---	---	---	---	---	---	---	---

Table 29.--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	
WyB2:												
Wynn----------	0-8	Silt loam	CL-ML, ML	A-4, A-6	0	0	100	100	85-100	80-90	16-36	2-12
	8-23	Silty clay loam	CH, CL	A-6, A-7	0	0	95-100	80-100	75-100	70-95	39-55	21-35
	23-28	Clay, clay loam, silty clay loam, silty clay	CH, CL	A-6, A-7	0	0	95-100	80-100	75-100	70-95	40-60	21-35
	28-38	Weathered bedrock			---	---	---	---	---	---	---	---
WyC2:												
Wynn----------	0-5	Silt loam	CL-ML, ML	A-4, A-6	0	0	100	100	85-100	80-90	16-36	2-12
	5-23	Clay, clay loam, silty clay loam, silty clay	CH, CL	A-6, A-7	0	0	95-100	80-100	75-100	70-95	39-55	21-35
	23-38	Weathered bedrock			---	---	---	---	---	---	---	---
WyD2:												
Wynn----------	0-5	Silt loam	CL-ML, ML	A-4, A-6	0	0	100	100	85-100	80-90	16-36	2-12
	5-28	Silty clay loam, clay loam, clay, silty clay	CH, CL	A-6, A-7	0	0	95-100	80-100	75-100	70-95	39-55	21-35
	28-38	Weathered bedrock			---	---	---	---	---	---	---	---
XeA:												
Xenia----------	0-9	Silt loam	CL-ML, ML	A-4, A-6	0	0	100	100	90-100	70-90	20-35	2-12
	9-38	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	95-100	85-95	35-49	17-26
	38-48	Clay loam, loam	CL-ML, CL	A-6, A-7	0	0-5	90-100	85-95	70-95	50-80	25-45	4-20
	48-80	Loam	CL, CL-ML	A-4, A-6	0	0-5	90-95	85-95	65-95	50-75	22-36	7-19
XeB:												
Xenia----------	0-9	Silt loam	CL-ML, ML	A-4, A-6	0	0	100	100	90-100	70-90	20-35	2-12
	9-29	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	95-100	85-95	35-49	17-26
	29-58	Clay loam, loam	CL, CL-ML	A-6, A-7	0	0-5	90-100	85-95	70-95	50-80	25-45	4-20
	58-80	Loam	CL-ML, CL	A-4, A-6	0	0-5	90-95	85-95	65-95	50-75	22-36	7-19
XeB2:												
Xenia----------	0-6	Silt loam	CL-ML, ML	A-4, A-6	0	0	100	100	90-100	70-90	20-35	2-12
	6-24	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	95-100	85-95	35-49	17-26
	24-44	Clay loam, loam	CL, CL-ML	A-6, A-7	0	0-5	90-100	85-95	70-95	50-80	25-45	4-20
	44-80	Loam	CL-ML, CL	A-4, A-6	0	0-5	90-95	85-95	65-95	50-75	22-36	7-19
XfB:												
Xenia----------	0-8	Silt loam	CL-ML, ML	A-4, A-6	0	0	100	100	90-100	70-90	20-35	2-12
	8-26	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	95-100	85-95	35-49	17-26
	26-46	Clay loam, loam	CL, CL-ML	A-6, A-7	0	0-5	90-100	85-95	70-95	50-80	25-45	4-20
	46-61	Loam, flaggy loam	CL-ML, CL	A-4, A-6	0	0-5	90-95	85-95	65-95	50-75	22-36	7-19
	61-65	Weathered bedrock			---	---	---	---	---	---	---	---

TABLE 30.--PHYSICAL PROPERTIES OF THE SOILS

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" apply only to the surface layer. Absence of an entry indicates that data were not estimated. See text on page 214 for additional information.)

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility	Available water capacity	Shrink-swell potential	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi-bility group
	In	Pct	g/cc	In/hr	In/in					
CeA:										
Celina----------	0-10	14-26	1.30-1.50	0.20-0.60	0.20-0.24	Low	.37	.37	4	5
	10-36	25-38	1.45-1.60	0.20-0.60	0.16-0.19	Moderate	.37	.37		
	36-80	20-30	1.60-1.82	0.01-0.06	0.06-0.10	Low	.37	.49		
CeB:										
Celina----------	0-9	14-26	1.30-1.50	0.20-0.60	0.20-0.24	Low	.37	.37	4	5
	9-38	25-38	1.45-1.60	0.20-0.60	0.16-0.19	Moderate	.37	.37		
	38-80	20-30	1.60-1.82	0.01-0.06	0.06-0.10	Low	.37	.49		
CeB2:										
Celina----------	0-8	14-26	1.30-1.50	0.20-0.60	0.20-0.24	Low	.37	.37	4	5
	8-28	25-38	1.45-1.60	0.20-0.60	0.16-0.19	Moderate	.37	.37		
	28-80	20-30	1.60-1.82	0.01-0.06	0.06-0.10	Low	.37	.49		
CoA:										
Corwin----------	0-11	15-26	1.30-1.60	0.60-2.00	0.18-0.24	Low	.37	.37	5	6
	11-38	25-35	1.50-1.70	0.60-2.00	0.11-0.16	Moderate	.28	.32		
	38-80	10-20	1.75-1.95	0.06-0.20	0.04-0.12	Low	.37	.43		
CtA:										
Crosby----------	0-10	10-24	1.30-1.60	0.60-2.00	0.18-0.24	Low	.43	.43	4	5
	10-25	35-45	1.45-1.65	0.60-2.00	0.11-0.16	Moderate	.28	.32		
	25-39	12-35	1.55-1.75	0.06-0.20	0.04-0.12	Low	.28	.37		
	39-80	10-25	1.75-1.95	0.01-0.20	0.02-0.04	Low	.32	.43		
Celina----------	0-8	14-26	1.30-1.50	0.20-0.60	0.20-0.24	Low	.37	.37	4	5
	8-34	25-38	1.45-1.60	0.20-0.60	0.16-0.19	Moderate	.37	.37		
	34-80	20-30	1.60-1.82	0.01-0.06	0.06-0.10	Low	.37	.49		
CtB:										
Crosby----------	0-7	10-24	1.30-1.60	0.60-2.00	0.18-0.24	Low	.43	.43	4	5
	7-21	35-45	1.45-1.65	0.60-2.00	0.11-0.16	Moderate	.28	.32		
	21-32	12-35	1.55-1.75	0.06-0.20	0.04-0.12	Low	.28	.37		
	32-80	10-25	1.75-1.95	0.01-0.20	0.02-0.04	Low	.32	.43		
Celina----------	0-10	14-26	1.30-1.50	0.20-0.60	0.20-0.24	Low	.37	.37	4	5
	10-39	25-38	1.45-1.60	0.20-0.60	0.16-0.19	Moderate	.37	.37		
	39-80	20-30	1.60-1.82	0.01-0.06	0.06-0.10	Low	.37	.49		
CvA:										
Crosby----------	0-9	10-24	1.30-1.60	0.60-2.00	0.18-0.24	Low	.43	.43	4	5
	9-28	35-45	1.45-1.65	0.60-2.00	0.11-0.16	Moderate	.28	.32		
	28-36	12-35	1.55-1.75	0.06-0.20	0.04-0.12	Low	.28	.37		
	36-80	10-25	1.75-1.95	0.01-0.20	0.02-0.04	Low	.32	.43		
Lewisburg-------	0-7	14-26	1.30-1.50	0.60-2.00	0.18-0.24	Low	.43	.43	3	5
	7-19	26-48	1.40-1.70	0.20-0.60	0.11-0.17	Moderate	.37	.37		
	19-80	18-27	1.70-2.00	0.06-0.20	0.08-0.12	Low	.37	.49		
CyA:										
Cyclone---------	0-12	18-25	1.50-1.70	0.60-2.00	0.22-0.24	Low	.28	.28	5	6
	12-50	25-35	1.50-1.70	0.60-2.00	0.18-0.20	Moderate	.28	.28		
	50-61	10-30	1.50-1.70	0.60-2.00	0.18-0.20	Moderate	.28	.28		
	61-80	10-20	1.50-1.70	0.20-0.60	0.20-0.22	Low	.28	.28		

Table 30.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Shrink- swell potential	Erosion factors Kw	Kf	T	Wind erodi- bility group
	In	Pct	g/cc	In/hr	In/in					
DaA:										
Dana----------	0-11	11-27	1.40-1.55	0.60-2.00	0.22-0.24	Low	.32	.32	5	5
	11-38	27-35	1.45-1.65	0.60-2.00	0.18-0.20	Moderate	.43	.43		
	38-55	25-35	1.45-1.65	0.60-2.00	0.15-0.19	Moderate	.43	.49		
	55-80	15-22	1.70-1.90	0.06-0.60	0.05-0.10	Low	.43	.55		
DaB:										
Dana----------	0-10	11-27	1.40-1.55	0.60-2.00	0.22-0.24	Low	.32	.32	5	5
	10-37	27-35	1.45-1.65	0.60-2.00	0.18-0.20	Moderate	.43	.43		
	37-48	25-35	1.45-1.65	0.60-2.00	0.15-0.19	Moderate	.43	.49		
	48-80	15-22	1.70-1.90	0.06-0.60	0.05-0.10	Low	.43	.55		
EeA:										
Eel----------	0-13	18-27	1.30-1.60	0.60-2.00	0.20-0.24	Low	.32	.32	5	6
	13-37	20-32	1.40-1.60	0.60-2.00	0.17-0.22	Low	.43	.43		
	37-48	15-28	1.40-1.60	0.60-2.00	0.14-0.22	Low	.37	.43		
	48-80	15-20	1.40-1.60	6.00-20.00	0.08-0.12	Low	.37	.43		
EgA:										
Eldean----------	0-4	15-27	1.30-1.50	0.60-2.00	0.15-0.18	Low	.28	.49	4	6
	4-24	35-48	1.40-1.60	0.20-2.00	0.08-0.14	Moderate	.37	.49		
	24-30	15-35	1.30-1.60	0.60-2.00	0.07-0.14	Low	.37	.64		
	30-80	2-8	1.55-1.70	6.00-20.00	0.01-0.04	Low	.10	.43		
EgB:										
Eldean----------	0-4	15-27	1.30-1.50	0.60-2.00	0.15-0.18	Low	.28	.49	4	6
	4-22	35-48	1.40-1.60	0.20-2.00	0.08-0.14	Moderate	.37	.49		
	22-30	15-35	1.30-1.60	0.60-2.00	0.07-0.14	Low	.37	.64		
	30-80	2-8	1.55-1.70	6.00-20.00	0.01-0.04	Low	.10	.43		
EgB2:										
Eldean----------	0-4	15-27	1.30-1.50	0.60-2.00	0.15-0.18	Low	.28	.49	4	6
	4-20	35-48	1.40-1.60	0.20-2.00	0.08-0.14	Moderate	.37	.49		
	20-26	15-35	1.30-1.60	0.60-2.00	0.07-0.14	Low	.37	.64		
	26-80	2-8	1.55-1.70	6.00-20.00	0.01-0.04	Low	.10	.43		
EhC3:										
Eldean----------	0-5	27-35	1.30-1.50	0.60-2.00	0.15-0.18	Low	.24	.43	4	6
	5-16	35-48	1.40-1.60	0.20-2.00	0.08-0.14	Moderate	.37	.49		
	16-22	15-35	1.30-1.60	0.60-2.00	0.07-0.14	Low	.37	.64		
	22-80	2-8	1.55-1.70	6.00-20.00	0.01-0.04	Low	.10	.43		
EhD3:										
Eldean----------	0-5	27-35	1.30-1.50	0.60-2.00	0.15-0.18	Low	.24	.43	4	6
	5-28	35-48	1.40-1.60	0.20-2.00	0.08-0.14	Moderate	.37	.49		
	28-35	15-35	1.30-1.60	0.60-2.00	0.07-0.14	Low	.37	.64		
	35-80	2-8	1.55-1.70	6.00-20.00	0.01-0.04	Low	.10	.43		
EkA:										
Eldean----------	0-9	15-25	1.30-1.50	0.60-2.00	0.18-0.22	Low	.37	.43	4	5
	9-28	20-48	1.40-1.60	0.20-2.00	0.08-0.14	Moderate	.37	.49		
	28-36	18-38	1.30-1.60	0.60-2.00	0.07-0.14	Low	.37	.64		
	36-80	2-8	1.55-1.70	6.00-20.00	0.01-0.04	Low	.10	.43		
EkB:										
Eldean----------	0-7	15-25	1.30-1.50	0.60-2.00	0.18-0.22	Low	.37	.43	4	5
	7-28	35-48	1.40-1.60	0.20-2.00	0.08-0.14	Moderate	.37	.49		
	28-34	18-38	1.30-1.60	0.60-2.00	0.07-0.14	Low	.37	.64		
	34-80	2-8	1.55-1.70	6.00-20.00	0.01-0.04	Low	.10	.43		
EkB2:										
Eldean----------	0-5	15-25	1.30-1.50	0.60-2.00	0.18-0.22	Low	.37	.43	4	5
	5-24	35-48	1.40-1.60	0.20-2.00	0.08-0.14	Moderate	.37	.49		
	24-32	18-38	1.30-1.60	0.60-2.00	0.07-0.14	Low	.37	.64		
	32-80	2-8	1.55-1.70	6.00-20.00	0.01-0.04	Low	.10	.43		

Table 30.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility	Available water capacity	Shrink-swell potential	Erosion factors Kw	Kf	T	Wind erodi-bility group
	In	Pct	g/cc	In/hr	In/in					
FcA:										
Fincastle-------	0-9	11-27	1.40-1.55	0.60-2.00	0.22-0.24	Low	.37	.37	5	5
	9-35	23-35	1.45-1.65	0.60-2.00	0.18-0.20	Moderate	.37	.37		
	35-46	12-32	1.45-1.65	0.20-0.60	0.15-0.19	Moderate	.37	.43		
	46-80	12-26	1.75-2.00	0.06-0.20	0.05-0.19	Low	.37	.43		
FdA:										
Fincastle-------	0-9	11-27	1.40-1.55	0.60-2.00	0.22-0.24	Low	.37	.37	5	5
	9-36	23-35	1.45-1.65	0.60-2.00	0.18-0.20	Moderate	.37	.37		
	36-43	12-32	1.45-1.65	0.20-0.60	0.15-0.19	Moderate	.37	.43		
	43-63	12-26	1.75-2.00	0.06-0.20	0.05-0.19	Low	.37	.43		
	63-67	---	---	0.00-0.20	---	---	---	---		
FmA:										
Fox----------	0-10	10-17	1.35-1.55	0.60-2.00	0.17-0.24	Low	.37	.37	4	5
	10-37	18-35	1.55-1.65	0.60-2.00	0.10-0.19	Moderate	.32	.32		
	37-64	0-2	1.30-1.70	6.00-60.00	0.02-0.07	Low	.10	.10		
	64-80	18-27	1.55-1.65	0.06-0.20	0.10-0.19	Moderate	.32	.32		
FmB:										
Fox----------	0-10	10-17	1.35-1.55	0.60-2.00	0.17-0.24	Low	.37	.37	4	5
	10-37	18-35	1.55-1.65	0.60-2.00	0.10-0.19	Moderate	.32	.32		
	37-65	0-2	1.30-1.70	6.00-60.00	0.02-0.07	Low	.10	.10		
	65-80	18-27	1.55-1.65	0.06-0.20	0.10-0.19	Moderate	.32	.32		
FmB2:										
Fox----------	0-8	10-17	1.35-1.55	0.60-2.00	0.17-0.24	Low	.37	.37	4	5
	8-38	18-35	1.55-1.65	0.60-2.00	0.10-0.19	Moderate	.32	.32		
	38-72	0-2	1.30-1.70	6.00-60.00	0.02-0.07	Low	.10	.10		
	72-80	18-27	1.55-1.65	0.06-0.20	0.10-0.19	Moderate	.32	.32		
HeF2:										
Hennepin--------	0-4	20-27	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.28	.28	5	4L
	4-16	25-35	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.32	.37		
	16-80	10-27	1.80-1.95	0.06-0.20	0.06-0.20	Low	.32	.32		
Miamian---------	0-4	14-27	1.30-1.50	0.20-0.60	0.20-0.24	Low	.37	.37	4	6
	4-19	27-35	1.40-1.60	0.20-0.60	0.16-0.20	Moderate	.37	.43		
	19-29	25-40	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.37	.43		
	29-80	16-26	1.80-2.00	0.06-0.20	0.06-0.10	Low	.37	.49		
HwE2:										
Hennepin--------	0-4	20-27	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.28	.28	5	4L
	4-16	20-35	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.32	.37		
	16-80	10-27	1.80-1.95	0.06-0.20	0.06-0.20	Low	.32	.32		
Wynn----------	0-5	17-27	1.30-1.50	0.20-0.60	0.22-0.24	Low	.37	.37	4	6
	5-30	30-45	1.45-1.75	0.20-0.60	0.15-0.20	Moderate	.37	.37		
	30-33	---	---	0.00-0.20	---	---	---	---		
HwF2:										
Hennepin--------	0-4	20-27	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.28	.28	5	4L
	4-13	20-35	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.32	.37		
	13-80	10-27	1.80-1.95	0.06-0.20	0.06-0.20	Low	.32	.32		
Wynn----------	0-4	17-27	1.30-1.50	0.20-0.60	0.22-0.24	Low	.37	.37	4	6
	4-24	30-45	1.45-1.75	0.20-0.60	0.15-0.20	Moderate	.37	.37		
	24-27	---	---	0.00-0.20	---	---	---	---		
KeC2:										
Kendallville----	0-5	8-24	1.30-1.50	0.60-2.00	0.18-0.24	Low	.37	.43	5	5
	5-30	27-38	1.40-1.65	0.60-2.00	0.12-0.16	Moderate	.37	.55		
	30-80	15-27	1.75-2.00	0.20-0.60	0.11-0.15	Low	.37	.43		

Table 30.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility	Available water capacity	Shrink-swell potential	Erosion factors Kw	Kf	T	Wind erodi-bility group
	In	Pct	g/cc	In/hr	In/in					
Eldean----------	0-5	15-25	1.30-1.50	0.60-2.00	0.18-0.22	Low	.37	.43	4	5
	5-26	35-48	1.40-1.60	0.20-2.00	0.08-0.14	Moderate	.37	.49		
	26-80	2-8	1.55-1.70	6.00-20.00	0.01-0.04	Low	.10	.43		
KeD2:										
Kendallville----	0-3	8-24	1.30-1.50	0.60-2.00	0.18-0.24	Low	.37	.43	5	5
	3-32	27-38	1.40-1.65	0.60-2.00	0.12-0.16	Moderate	.37	.55		
	32-80	15-27	1.75-2.00	0.20-0.60	0.11-0.15	Low	.37	.43		
Eldean----------	0-4	15-25	1.30-1.50	0.60-2.00	0.18-0.22	Low	.37	.43	4	5
	4-33	35-48	1.40-1.60	0.20-2.00	0.08-0.14	Moderate	.37	.49		
	33-80	2-8	1.55-1.70	6.00-20.00	0.01-0.04	Low	.10	.43		
KnA:										
Kokomo----------	0-10	20-27	1.30-1.45	0.20-0.60	0.20-0.24	Moderate	.28	.28	5	6
	10-50	30-45	1.40-1.60	0.20-0.60	0.18-0.20	Moderate	.32	.32		
	50-68	25-45	1.40-1.60	0.20-0.60	0.18-0.20	Moderate	.32	.32		
	68-80	15-27	1.50-1.75	0.06-0.20	0.05-0.19	Low	.32	.37		
KoA:										
Kokomo----------	0-11	27-35	1.35-1.50	0.20-0.60	0.17-0.19	Moderate	.24	.24	5	6
	11-41	30-40	1.40-1.60	0.20-0.60	0.18-0.20	Moderate	.32	.32		
	41-64	25-45	1.40-1.60	0.20-0.60	0.18-0.20	Moderate	.32	.32		
	64-80	15-27	1.50-1.75	0.06-0.20	0.05-0.19	Low	.32	.37		
LeB:										
Lewisburg-------	0-9	16-27	1.30-1.50	0.60-2.00	0.18-0.24	Low	.43	.43	3	6
	9-19	26-48	1.40-1.70	0.20-2.00	0.11-0.17	Moderate	.32	.37		
	19-80	18-27	1.70-2.00	0.06-0.20	0.08-0.12	Low	.32	.49		
Celina----------	0-9	14-26	1.30-1.50	0.20-0.60	0.20-0.24	Low	.37	.37	4	5
	9-34	25-38	1.45-1.60	0.20-0.60	0.16-0.19	Moderate	.37	.37		
	34-80	20-30	1.60-1.82	0.01-0.06	0.06-0.10	Low	.37	.49		
LfB2:										
Lewisburg-------	0-6	27-35	1.30-1.50	0.60-2.00	0.18-0.24	Low	.43	.43	3	6
	6-19	27-48	1.40-1.70	0.20-2.00	0.11-0.17	Moderate	.32	.37		
	19-80	18-27	1.70-2.00	0.06-0.20	0.08-0.12	Low	.32	.49		
Celina----------	0-8	27-35	1.30-1.50	0.20-0.60	0.20-0.24	Low	.32	.32	4	6
	8-30	25-38	1.45-1.60	0.20-0.60	0.16-0.19	Moderate	.37	.37		
	30-80	20-30	1.60-1.82	0.01-0.06	0.06-0.10	Low	.37	.49		
LgC3:										
Lewisburg-------	0-4	27-35	1.30-1.50	0.60-2.00	0.18-0.24	Low	.43	.43	3	6
	4-19	27-48	1.40-1.70	0.20-2.00	0.11-0.17	Moderate	.32	.37		
	19-80	18-27	1.70-2.00	0.06-0.20	0.08-0.12	Low	.32	.49		
LpA:										
Lippincott------	0-11	27-36	1.35-1.50	0.60-2.00	0.17-0.23	Moderate	.28	.32	4	6
	11-25	35-50	1.45-1.60	0.60-2.00	0.13-0.17	Moderate	.28	.32		
	25-36	5-35	1.50-1.75	6.00-20.00	0.04-0.10	Low	.10	.37		
	36-80	2-10	1.50-1.75	6.00-20.00	0.02-0.04	Low	.10	.37		
MaA:										
Medway----------	0-12	18-27	1.20-1.45	0.60-2.00	0.20-0.24	Low	.28	.28	5	6
	12-38	18-32	1.20-1.50	0.60-2.00	0.14-0.18	Low	.32	.37		
	38-80	5-30	1.20-1.60	0.60-6.00	0.08-0.15	Low	.32	.49		
MbB2:										
Miami----------	0-5	7-26	1.30-1.60	0.60-2.00	0.20-0.24	Low	.37	.37	5	5
	5-23	27-35	1.40-1.70	0.60-2.00	0.07-0.21	Moderate	.32	.32		
	23-30	15-30	1.60-1.80	0.20-0.60	0.07-0.17	Low	.37	.43		
	30-80	10-20	1.75-2.00	0.01-0.20	0.01-0.03	Low	.37	.43		

Table 30.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility	Available water capacity	Shrink-swell potential	Erosion factors Kw	Kf	T	Wind erodi-bility group
	In	Pct	g/cc	In/hr	In/in					
McE2:										
Miami----------	0-5	7-26	1.30-1.60	0.60-2.00	0.20-0.24	Low	.37	.37	5	5
	5-22	27-35	1.40-1.70	0.60-2.00	0.07-0.21	Moderate	.32	.32		
	22-31	15-25	1.60-1.80	0.20-0.60	0.07-0.17	Low	.37	.43		
	31-80	10-20	1.75-2.00	0.01-0.20	0.01-0.03	Low	.37	.43		
Kendallville----	0-5	8-24	1.30-1.50	0.60-2.00	0.18-0.24	Low	.37	.43	5	5
	5-31	27-38	1.40-1.65	0.60-2.00	0.12-0.16	Moderate	.37	.55		
	31-80	15-27	1.75-2.00	0.20-0.60	0.11-0.15	Low	.37	.43		
McF2:										
Miami----------	0-4	7-26	1.30-1.60	0.60-2.00	0.20-0.24	Low	.37	.37	5	5
	4-10	24-35	1.40-1.60	0.60-2.00	0.16-0.20	Moderate	.49	.49		
	10-22	27-35	1.40-1.70	0.60-2.00	0.07-0.21	Moderate	.32	.32		
	22-28	12-32	1.60-1.80	0.20-0.60	0.07-0.17	Low	.37	.43		
	28-80	10-20	1.75-2.00	0.01-0.20	0.01-0.03	Low	.37	.43		
Kendallville----	0-4	8-24	1.30-1.50	0.60-2.00	0.18-0.24	Low	.37	.43	5	5
	4-40	27-38	1.40-1.65	0.60-2.00	0.12-0.16	Moderate	.37	.55		
	40-80	15-27	1.75-2.00	0.20-0.60	0.11-0.15	Low	.37	.43		
MdC2:										
Miami----------	0-5	20-27	1.30-1.60	0.60-2.00	0.20-0.24	Low	.37	.37	5	6
	5-20	27-35	1.40-1.70	0.60-2.00	0.07-0.21	Moderate	.32	.32		
	20-26	15-30	1.60-1.80	0.20-0.60	0.07-0.17	Low	.37	.43		
	26-80	10-20	1.75-2.00	0.01-0.20	0.01-0.03	Low	.37	.43		
MdD2:										
Miami----------	0-5	20-27	1.30-1.60	0.60-2.00	0.20-0.24	Low	.37	.37	5	6
	5-24	27-35	1.40-1.70	0.60-2.00	0.07-0.21	Moderate	.32	.32		
	24-30	15-30	1.60-1.80	0.20-0.60	0.07-0.17	Low	.37	.43		
	30-80	10-20	1.75-2.00	0.01-0.20	0.01-0.03	Low	.37	.43		
MeC:										
Miamian---------	0-9	14-27	1.30-1.50	0.20-0.60	0.20-0.24	Low	.37	.37	4	6
	9-12	35-48	1.40-1.60	0.20-0.60	0.16-0.20	Moderate	.37	.43		
	12-24	25-40	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.37	.43		
	24-80	16-26	1.80-2.00	0.06-0.20	0.06-0.10	Low	.37	.49		
MeC2:										
Miamian---------	0-6	14-27	1.30-1.50	0.20-0.60	0.20-0.24	Low	.37	.37	4	6
	6-18	35-48	1.40-1.60	0.20-0.60	0.16-0.20	Moderate	.37	.43		
	18-29	25-40	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.37	.43		
	29-80	16-26	1.80-2.00	0.06-0.20	0.06-0.10	Low	.37	.49		
MeD2:										
Miamian---------	0-6	14-27	1.30-1.50	0.20-0.60	0.20-0.24	Low	.37	.37	4	6
	6-22	35-48	1.40-1.60	0.20-0.60	0.16-0.20	Moderate	.37	.43		
	22-27	25-40	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.37	.43		
	27-80	16-26	1.80-2.00	0.06-0.20	0.06-0.10	Low	.37	.49		
MfB:										
Miamian---------	0-9	14-27	1.30-1.50	0.20-0.60	0.20-0.24	Low	.37	.37	4	6
	9-29	27-45	1.40-1.60	0.20-0.60	0.16-0.20	Moderate	.37	.43		
	29-35	25-40	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.37	.43		
	35-80	16-26	1.80-2.00	0.06-0.20	0.06-0.10	Low	.37	.49		
Celina----------	0-10	14-26	1.30-1.50	0.20-0.60	0.20-0.24	Low	.37	.37	4	5
	10-34	25-38	1.45-1.60	0.20-0.60	0.16-0.19	Moderate	.37	.37		
	34-80	20-30	1.60-1.82	0.01-0.06	0.06-0.10	Low	.37	.49		

Table 30.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility	Available water capacity	Shrink-swell potential	Erosion factors Kw	Kf	T	Wind erodi-bility group
	In	Pct	g/cc	In/hr	In/in					
MfB2:										
Miamian---------	0-9	14-27	1.30-1.50	0.20-0.60	0.20-0.24	Low	.37	.37	4	6
	9-24	27-45	1.40-1.60	0.20-0.60	0.16-0.20	Moderate	.37	.43		
	24-36	25-40	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.37	.43		
	36-80	16-26	1.80-2.00	0.06-0.20	0.06-0.10	Low	.37	.49		
Celina----------	0-9	14-26	1.30-1.50	0.20-0.60	0.20-0.24	Low	.37	.37	4	5
	9-33	25-38	1.45-1.60	0.20-0.60	0.16-0.19	Moderate	.37	.37		
	33-80	20-30	1.60-1.82	0.01-0.06	0.06-0.10	Low	.37	.49		
MgE2:										
Miamian---------	0-4	14-27	1.30-1.50	0.20-0.60	0.20-0.24	Low	.37	.37	4	6
	4-28	35-48	1.40-1.60	0.20-0.60	0.16-0.20	Moderate	.37	.43		
	28-38	25-40	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.37	.43		
	38-80	16-26	1.80-2.00	0.06-0.20	0.06-0.10	Low	.37	.49		
Kendallville----	0-4	8-24	1.30-1.50	0.60-2.00	0.18-0.24	Low	.37	.43	5	5
	4-29	27-38	1.40-1.65	0.60-2.00	0.12-0.16	Moderate	.37	.55		
	29-80	15-27	1.75-2.00	0.20-0.60	0.11-0.15	Low	.37	.43		
MgF2:										
Miamian---------	0-6	14-27	1.30-1.50	0.20-0.60	0.20-0.24	Low	.37	.37	4	6
	6-23	35-48	1.40-1.60	0.20-0.60	0.16-0.20	Moderate	.37	.43		
	23-28	25-40	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.37	.43		
	28-80	16-26	1.80-2.00	0.06-0.20	0.06-0.10	Low	.37	.49		
Kendallville----	0-4	8-24	1.30-1.50	0.60-2.00	0.18-0.24	Low	.37	.43	5	5
	4-35	27-38	1.40-1.65	0.60-2.00	0.12-0.16	Moderate	.37	.55		
	35-80	15-27	1.75-2.00	0.20-0.60	0.11-0.15	Low	.37	.43		
MhC3:										
Miamian---------	0-4	27-35	1.30-1.50	0.20-0.60	0.20-0.24	Low	.32	.32	4	6
	4-19	27-45	1.40-1.60	0.20-0.60	0.16-0.20	Moderate	.37	.43		
	19-26	25-40	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.37	.43		
	26-80	16-26	1.80-2.00	0.06-0.20	0.06-0.10	Low	.37	.49		
Losantville-----	0-3	27-35	1.30-1.55	0.20-0.60	0.18-0.24	Low	.32	.32	3	6
	3-19	25-40	1.50-1.70	0.20-0.60	0.07-0.14	Moderate	.28	.32		
	19-80	18-24	1.70-2.00	0.01-0.20	0.02-0.04	Low	.37	.49		
MhD3:										
Miamian---------	0-3	27-35	1.30-1.50	0.20-0.60	0.20-0.24	Low	.32	.32	4	6
	3-26	27-42	1.40-1.60	0.20-0.60	0.16-0.20	Moderate	.37	.43		
	26-33	25-40	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.37	.43		
	33-80	16-26	1.80-2.00	0.06-0.20	0.06-0.10	Low	.37	.49		
Losantville-----	0-3	27-35	1.30-1.55	0.20-0.60	0.18-0.24	Low	.32	.32	3	6
	3-14	25-40	1.50-1.70	0.20-0.60	0.07-0.14	Moderate	.28	.32		
	14-80	18-24	1.70-2.00	0.01-0.20	0.02-0.04	Low	.37	.49		
MmE2:										
Miamian---------	0-3	14-27	1.30-1.50	0.20-0.60	0.20-0.24	Low	.37	.37	4	6
	3-18	35-48	1.40-1.60	0.20-0.60	0.16-0.20	Moderate	.37	.43		
	18-26	25-40	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.37	.43		
	26-80	16-26	1.80-2.00	0.06-0.20	0.06-0.10	Low	.37	.49		
Hennepin--------	0-4	20-27	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.28	.28	5	4L
	4-19	25-35	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.32	.37		
	19-80	10-27	1.80-1.95	0.06-0.20	0.06-0.20	Low	.32	.32		
MnE3:										
Miamian---------	0-3	27-35	1.30-1.50	0.20-0.60	0.20-0.24	Low	.32	.32	4	6
	3-18	27-42	1.40-1.60	0.20-0.60	0.16-0.20	Moderate	.37	.43		
	18-26	25-40	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.37	.43		
	26-80	16-26	1.80-2.00	0.06-0.20	0.06-0.10	Low	.37	.49		

Table 30.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility	Available water capacity	Shrink-swell potential	Erosion factors Kw	Kf	T	Wind erodi-bility group
	In	Pct	g/cc	In/hr	In/in					
Hennepin--------	0-4	27-35	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.28	.28	5	4L
	4-18	25-35	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.32	.37		
	18-80	10-27	1.80-1.95	0.06-0.20	0.06-0.20	Low	.32	.32		
MpA:										
Milford---------	0-10	30-39	1.35-1.45	0.20-0.60	0.21-0.23	Moderate	.28	.28	5	4
	10-34	35-45	1.40-1.60	0.20-0.60	0.15-0.20	High	.32	.32		
	34-46	25-42	1.40-1.60	0.20-0.60	0.15-0.20	High	.32	.32		
	46-80	20-30	1.50-1.60	0.20-0.60	0.18-0.22	Low	.28	.32		
MrA:										
Milford---------	0-11	30-39	1.35-1.45	0.20-0.60	0.21-0.23	Moderate	.28	.28	5	4
	11-24	35-45	1.40-1.60	0.20-0.60	0.15-0.20	High	.32	.32		
	24-46	25-42	1.40-1.60	0.20-0.60	0.15-0.20	High	.32	.32		
	46-73	1-29	1.50-1.60	0.60-2.00	0.18-0.22	Low	.28	.32		
	73-80	0-6	1.30-1.70	6.00-60.00	0.02-0.07	Low	.10	.10		
MsA:										
Millsdale-------	0-16	20-27	1.30-1.50	0.20-0.60	0.17-0.22	Moderate	.28	.32	2	6
	16-25	35-45	1.40-1.65	0.20-0.60	0.12-0.16	High	.32	.37		
	25-32	---	---	0.00-0.20	---	---	---	---		
MtA:										
Millsdale-------	0-14	27-32	1.30-1.50	0.20-0.60	0.17-0.22	Moderate	.28	.32	2	6
	14-30	35-45	1.40-1.65	0.20-0.60	0.12-0.16	High	.32	.37		
	30-38	---	---	0.00-0.20	---	---	---	---		
MuA:										
Milton----------	0-9	14-27	1.30-1.50	0.60-2.00	0.18-0.23	Low	.37	.37	2	6
	9-31	25-45	1.45-1.65	0.20-2.00	0.12-0.18	Moderate	.37	.43		
	31-60	---	---	0.00-0.20	---	---	---	---		
MuB:										
Milton----------	0-9	14-27	1.30-1.50	0.60-2.00	0.18-0.23	Low	.37	.37	2	6
	9-28	25-45	1.45-1.65	0.20-2.00	0.12-0.18	Moderate	.37	.43		
	28-60	---	---	0.00-0.20	---	---	---	---		
MuB2:										
Milton----------	0-5	14-27	1.30-1.50	0.60-2.00	0.18-0.23	Low	.37	.37	2	6
	5-24	25-45	1.45-1.65	0.20-2.00	0.12-0.18	Moderate	.37	.43		
	24-28	25-45	1.40-1.70	0.20-2.00	0.12-0.16	Moderate	.37	.43		
	28-35	---	---	0.00-0.20	---	---	---	---		
MuC2:										
Milton----------	0-3	14-27	1.30-1.50	0.60-2.00	0.18-0.23	Low	.37	.37	2	6
	3-25	25-45	1.45-1.65	0.20-2.00	0.12-0.18	Moderate	.37	.43		
	25-28	18-38	1.40-1.70	0.20-2.00	0.12-0.16	Moderate	.37	.43		
	28-35	---	---	0.00-0.20	---	---	---	---		
MuD2:										
Milton----------	0-5	14-27	1.30-1.50	0.60-2.00	0.18-0.23	Low	.37	.37	2	6
	5-25	32-45	1.45-1.65	0.20-2.00	0.12-0.18	Moderate	.37	.43		
	25-29	25-45	1.40-1.70	0.20-2.00	0.12-0.16	Moderate	.37	.43		
	29-36	---	---	0.00-0.20	---	---	---	---		
MuE2:										
Milton----------	0-4	14-27	1.30-1.50	0.60-2.00	0.18-0.23	Low	.37	.37	2	6
	4-16	32-45	1.45-1.65	0.20-2.00	0.12-0.18	Moderate	.37	.43		
	16-23	25-45	1.40-1.70	0.20-2.00	0.12-0.16	Moderate	.37	.43		
	23-35	---	---	0.00-0.20	---	---	---	---		

Table 30.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility	Available water capacity	Shrink-swell potential	Erosion factors Kw	Kf	T	Wind erodi-bility group
	In	Pct	g/cc	In/hr	In/in					
MwA:										
Morningsun------	0-10	15-27	1.30-1.50	0.60-2.00	0.22-0.25	Low	.37	.37	5	6
	10-33	20-35	1.35-1.55	0.60-2.00	0.21-0.24	Low	.37	.37		
	33-42	10-30	1.35-1.55	0.60-2.00	0.21-0.24	Low	.37	.37		
	42-51	10-30	1.35-1.55	0.60-2.00	0.14-0.24	Moderate	.37	.37		
	51-80	5-10	1.70-1.95	0.60-2.00	0.05-0.19	Low	.37	.43		
MxA:										
Morningsun------	0-11	15-27	1.30-1.50	0.60-2.00	0.22-0.25	Low	.37	.37	5	6
	11-38	20-35	1.35-1.55	0.60-2.00	0.21-0.24	Low	.37	.37		
	38-45	10-30	1.35-1.55	0.60-2.00	0.21-0.24	Low	.37	.37		
	45-58	10-30	1.35-1.55	0.60-2.00	0.14-0.24	Moderate	.37	.37		
	58-80	5-10	1.70-1.95	0.60-2.00	0.05-0.19	Low	.37	.43		
Xenia----------	0-9	11-27	1.30-1.50	0.60-2.00	0.22-0.24	Low	.37	.37	5	5
	9-30	20-40	1.45-1.65	0.60-2.00	0.18-0.20	Moderate	.37	.37		
	30-45	24-35	1.45-1.65	0.20-0.60	0.15-0.19	Moderate	.37	.43		
	45-80	12-27	1.70-1.90	0.06-0.20	0.05-0.10	Low	.37	.43		
MxB:										
Morningsun------	0-10	15-27	1.30-1.50	0.60-2.00	0.22-0.25	Low	.37	.37	5	6
	10-34	20-35	1.35-1.55	0.60-2.00	0.21-0.24	Low	.37	.37		
	34-48	10-30	1.35-1.55	0.60-2.00	0.14-0.24	Moderate	.37	.37		
	48-80	5-10	1.70-1.95	0.60-2.00	0.05-0.19	Low	.37	.43		
Xenia----------	0-9	11-27	1.30-1.50	0.60-2.00	0.22-0.24	Low	.37	.37	5	5
	9-30	25-35	1.45-1.65	0.60-2.00	0.18-0.20	Moderate	.37	.37		
	30-50	24-35	1.45-1.65	0.20-0.60	0.15-0.19	Moderate	.37	.43		
	50-80	12-27	1.70-1.90	0.06-0.20	0.05-0.10	Low	.37	.43		
MxB2:										
Morningsun------	0-6	15-27	1.30-1.50	0.60-2.00	0.22-0.25	Low	.37	.37	5	6
	6-26	20-35	1.35-1.55	0.60-2.00	0.21-0.24	Low	.37	.37		
	26-31	10-30	1.35-1.55	0.60-2.00	0.21-0.24	Low	.37	.37		
	31-50	10-30	1.35-1.55	0.60-2.00	0.14-0.24	Moderate	.37	.37		
	50-80	5-10	1.70-1.95	0.60-2.00	0.05-0.19	Low	.37	.43		
Xenia----------	0-5	11-27	1.30-1.50	0.60-2.00	0.22-0.24	Low	.37	.37	5	5
	5-28	27-35	1.45-1.65	0.60-2.00	0.18-0.20	Moderate	.37	.37		
	28-45	24-35	1.45-1.65	0.20-0.60	0.15-0.19	Moderate	.37	.43		
	45-80	12-27	1.70-1.90	0.06-0.20	0.05-0.10	Low	.37	.43		
MyA:										
Mahalasville----	0-12	20-27	1.20-1.65	0.60-2.00	0.20-0.26	Moderate	.28	.28	5	6
	12-39	25-38	1.40-1.70	0.60-2.00	0.18-0.20	Moderate	.37	.37		
	39-44	18-27	1.50-1.70	0.60-2.00	0.15-0.19	Moderate	.37	.37		
	44-80	2-10	1.60-1.80	2.00-6.00	0.03-0.05	Low	.15	.15		
OcA:										
Ockley----------	0-9	11-27	1.30-1.40	0.60-2.00	0.20-0.24	Low	.37	.37	4	5
	9-48	20-37	1.40-1.55	0.60-2.00	0.06-0.11	Moderate	.24	.43		
	48-80	2-6	1.60-1.80	20.00-99.90	0.02-0.04	Low	.10	.37		
OcB:										
Ockley----------	0-9	11-27	1.30-1.40	0.60-2.00	0.20-0.24	Low	.37	.37	4	5
	9-50	20-35	1.40-1.55	0.60-2.00	0.06-0.11	Moderate	.24	.43		
	50-80	2-6	1.60-1.80	20.00-99.90	0.02-0.04	Low	.10	.37		
Pg:										
Pits, gravel----	---	---	---	---	---	---	---	---	-	---
Pq:										
Pits, quarry----	---	---	---	---	---	---	---	---	-	---

Table 30.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility	Available water capacity	Shrink-swell potential	Erosion factors Kw	Kf	T	Wind erodi-bility group
	In	Pct	g/cc	In/hr	In/in					
PtB:										
Plattville------	0-18	15-26	1.30-1.60	0.60-2.00	0.18-0.24	Low	.32	.32	3	6
	18-43	25-35	1.50-1.70	0.60-2.00	0.11-0.16	Moderate	.28	.32		
	43-54	15-55	1.70-1.90	0.60-2.00	0.04-0.12	Low	.37	.43		
	54-57	---	---	0.00-0.20	---	---	---	---		
RaA:										
Rainsville------	0-8	13-25	1.30-1.60	0.60-2.00	0.20-0.24	Low	.43	.43	5	5
	8-15	24-30	1.40-1.60	0.60-2.00	0.16-0.20	Moderate	.49	.49		
	15-35	20-30	1.40-1.60	0.60-2.00	0.17-0.19	Moderate	.43	.43		
	35-55	20-30	1.40-1.60	0.20-0.60	0.14-0.18	Moderate	.32	.37		
	55-80	15-22	1.75-2.00	0.01-0.20	0.02-0.04	Low	.32	.37		
RaB:										
Rainsville------	0-10	13-25	1.30-1.60	0.60-2.00	0.20-0.24	Low	.43	.43	5	5
	10-16	24-30	1.40-1.60	0.60-2.00	0.16-0.20	Moderate	.49	.49		
	16-44	20-30	1.40-1.60	0.60-2.00	0.17-0.19	Moderate	.43	.43		
	44-50	20-30	1.40-1.60	0.20-0.60	0.14-0.18	Moderate	.32	.37		
	50-80	15-22	1.75-2.00	0.01-0.20	0.02-0.04	Low	.32	.37		
RaB2:										
Rainsville------	0-6	13-25	1.30-1.60	0.60-2.00	0.20-0.24	Low	.43	.43	5	5
	6-36	20-30	1.40-1.60	0.60-2.00	0.17-0.19	Moderate	.43	.43		
	36-52	20-30	1.40-1.60	0.20-0.60	0.14-0.18	Moderate	.32	.37		
	52-80	15-22	1.75-2.00	0.01-0.20	0.02-0.04	Low	.32	.37		
RcA:										
Randolph--------	0-10	16-27	1.30-1.45	0.20-0.60	0.17-0.22	Low	.37	.37	2	6
	10-27	35-50	1.40-1.65	0.20-0.60	0.13-0.16	Moderate	.37	.43		
	27-33	27-42	1.50-1.70	0.20-0.60	0.04-0.11	Low	.37	.64		
	33-35	---	---	0.00-0.20	---	---	---	---		
RcB:										
Randolph--------	0-8	16-27	1.30-1.45	0.20-0.60	0.17-0.22	Low	.37	.37	2	6
	8-23	35-50	1.40-1.65	0.20-0.60	0.13-0.16	Moderate	.37	.43		
	23-32	27-36	1.50-1.70	0.20-0.60	0.04-0.11	Low	.37	.64		
	32-35	---	---	0.00-0.20	---	---	---	---		
RnE2:										
Rodman----------	0-8	8-25	1.20-1.50	2.00-6.00	0.10-0.12	Low	.20	.32	3	5
	8-12	5-25	1.10-1.50	2.00-6.00	0.09-0.12	Low	.20	.32		
	12-80	0-10	1.60-1.70	20.00-99.90	0.02-0.04	Low	.10	.37		
RnF2:										
Rodman----------	0-4	8-25	1.20-1.50	2.00-6.00	0.10-0.12	Low	.20	.32	3	5
	4-12	5-25	1.10-1.50	2.00-6.00	0.09-0.12	Low	.20	.32		
	12-80	0-10	1.60-1.70	20.00-99.90	0.02-0.04	Low	.10	.37		
RoE2:										
Rodman----------	0-8	8-25	1.20-1.50	2.00-6.00	0.10-0.12	Low	.20	.32	3	5
	8-12	5-25	1.10-1.50	2.00-6.00	0.09-0.12	Low	.20	.32		
	12-80	0-10	1.60-1.70	20.00-99.90	0.02-0.04	Low	.10	.37		
Kendallville----	0-12	8-24	1.30-1.50	0.60-2.00	0.18-0.24	Low	.37	.43	5	5
	12-49	27-37	1.40-1.65	0.60-2.00	0.12-0.16	Moderate	.37	.55		
	49-80	15-27	1.75-2.00	0.20-0.60	0.11-0.15	Low	.37	.43		
RoF2:										
Rodman----------	0-4	8-25	1.20-1.50	2.00-6.00	0.10-0.12	Low	.20	.32	3	5
	4-12	5-25	1.10-1.50	2.00-6.00	0.09-0.12	Low	.20	.32		
	12-80	0-10	1.60-1.70	20.00-99.90	0.02-0.04	Low	.10	.37		
Kendallville----	0-7	8-24	1.30-1.50	0.60-2.00	0.18-0.24	Low	.37	.43	5	5
	7-40	27-38	1.40-1.65	0.60-2.00	0.12-0.16	Moderate	.37	.55		
	40-80	15-27	1.75-2.00	0.20-0.60	0.11-0.15	Low	.37	.43		

Table 30.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Shrink- swell potential	Erosion factors Kw	Kf	T	Wind erodi- bility group
	In	Pct	g/cc	In/hr	In/in					
RpA:										
Rossburg--------	0-18	13-27	1.20-1.50	0.60-2.00	0.19-0.24	Low	.37	.37	5	5
	18-35	18-27	1.25-1.60	0.60-2.00	0.15-0.22	Low	.37	.37		
	35-52	5-15	1.30-1.60	2.00-20.00	0.05-0.15	Low	.24	.32		
	52-80	0-10	1.20-1.50	2.00-20.00	0.02-0.05	Low	.10	.17		
RuB:										
Russell---------	0-8	11-27	1.30-1.45	0.60-2.00	0.21-0.24	Low	.37	.37	5	5
	8-35	25-35	1.40-1.60	0.60-2.00	0.18-0.20	Moderate	.37	.37		
	35-58	23-33	1.40-1.60	0.60-2.00	0.15-0.19	Moderate	.37	.37		
	58-80	12-27	1.60-1.80	0.20-0.60	0.05-0.19	Low	.37	.43		
Miamian---------	0-5	14-27	1.30-1.50	0.20-0.60	0.20-0.24	Low	.37	.37	4	6
	5-10	25-45	1.40-1.60	0.20-0.60	0.16-0.20	Moderate	.37	.43		
	10-32	25-40	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.37	.43		
	32-80	16-26	1.80-2.00	0.06-0.20	0.06-0.10	Low	.37	.49		
RuB2:										
Russell---------	0-6	11-27	1.30-1.45	0.60-2.00	0.21-0.24	Low	.37	.37	5	5
	6-32	25-35	1.40-1.60	0.60-2.00	0.18-0.20	Moderate	.37	.37		
	32-50	23-33	1.40-1.60	0.60-2.00	0.15-0.19	Moderate	.37	.37		
	50-80	12-27	1.60-1.80	0.20-0.60	0.05-0.19	Low	.37	.43		
Miamian---------	0-4	14-27	1.30-1.50	0.20-0.60	0.20-0.24	Low	.37	.37	4	6
	4-26	25-45	1.40-1.60	0.20-0.60	0.16-0.20	Moderate	.37	.43		
	26-33	25-40	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.37	.43		
	33-80	16-26	1.80-2.00	0.06-0.20	0.06-0.10	Low	.37	.49		
SeA:										
Savona----------	0-7	10-25	1.25-1.45	0.60-2.00	0.20-0.24	Low	.37	.37	4	5
	7-29	25-42	1.30-1.50	0.20-2.00	0.08-0.17	Moderate	.37	.43		
	29-45	15-35	1.25-1.45	0.20-2.00	0.12-0.17	Low	.24	.49		
	45-80	2-10	1.20-1.50	6.00-20.00	0.02-0.05	Low	.10	.43		
SnA:										
Sloan-----------	0-10	15-27	1.20-1.40	0.60-2.00	0.19-0.24	Low	.28	.28	5	6
	10-45	20-40	1.25-1.55	0.20-2.00	0.15-0.19	Moderate	.37	.37		
	45-60	8-27	1.20-1.50	2.00-20.00	0.13-0.18	Low	.37	.43		
	60-80	0-10	1.20-1.50	2.00-20.00	0.02-0.05	Low	.10	.17		
StA:										
Stonelick-------	0-10	10-20	1.35-1.45	2.00-6.00	0.20-0.22	Low	.32	.37	5	4L
	10-30	6-27	1.35-1.70	2.00-6.00	0.19-0.21	Low	.24	.28		
	30-80	4-10	1.70-1.80	6.00-20.00	0.02-0.04	Low	.10	.37		
SvA:										
Sugarvalley-----	0-10	12-27	1.20-1.45	0.60-2.00	0.17-0.24	Low	.37	.37	5	5
	10-41	25-35	1.30-1.55	0.60-2.00	0.17-0.22	Moderate	.37	.37		
	41-51	10-30	1.35-1.55	0.60-2.00	0.15-0.20	Low	.37	.37		
	51-61	10-30	1.35-1.55	0.60-2.00	0.14-0.24	Moderate	.37	.37		
	61-80	5-28	1.70-1.95	0.60-2.00	0.15-0.18	Low	.37	.43		
SwA:										
Sugarvalley-----	0-9	12-27	1.20-1.45	0.60-2.00	0.17-0.24	Low	.37	.37	5	5
	9-30	25-35	1.30-1.55	0.60-2.00	0.17-0.22	Moderate	.37	.37		
	30-50	10-30	1.35-1.55	0.60-2.00	0.15-0.20	Low	.37	.37		
	50-80	5-28	1.70-1.95	0.60-2.00	0.15-0.18	Low	.37	.43		
Fincastle-------	0-11	11-22	1.40-1.55	0.60-2.00	0.22-0.24	Low	.37	.37	5	5
	11-32	23-35	1.45-1.65	0.60-2.00	0.18-0.20	Moderate	.37	.37		
	32-48	24-32	1.45-1.65	0.60-2.00	0.15-0.19	Moderate	.37	.37		
	48-80	20-26	1.55-1.90	0.06-0.20	0.05-0.19	Low	.37	.43		

Table 30.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility	Available water capacity	Shrink-swell potential	Erosion factors Kw	Kf	T	Wind erodi-bility group
	In	Pct	g/cc	In/hr	In/in					
ThA:										
Thackery--------	0-12	15-25	1.30-1.50	0.60-2.00	0.20-0.24	Low	.37	.37	4	5
	12-21	20-35	1.30-1.55	0.60-2.00	0.17-0.22	Low	.37	.37		
	21-54	25-30	1.35-1.60	0.60-2.00	0.13-0.18	Moderate	.37	.43		
	54-80	2-12	1.60-1.80	6.00-20.00	0.02-0.06	Low	.10	.49		
ThB:										
Thackery--------	0-12	15-25	1.30-1.50	0.60-2.00	0.20-0.24	Low	.37	.37	4	5
	12-67	25-30	1.35-1.60	0.60-2.00	0.13-0.18	Moderate	.37	.43		
	67-80	2-12	1.60-1.80	6.00-20.00	0.02-0.06	Low	.10	.49		
Ud:										
Udorthents------	---	---	---	---	---	---	---	---	-	---
W:										
Water----------	---	---	---	---	---	---	---	---	-	---
WbA:										
Warsaw----------	0-12	15-25	1.30-1.50	0.60-2.00	0.20-0.24	Low	.28	.28	4	5
	12-21	17-30	1.35-1.60	0.60-2.00	0.16-0.19	Low	.28	.32		
	21-30	20-30	1.40-1.65	0.60-2.00	0.13-0.16	Low	.28	.43		
	30-80	2-8	1.40-1.65	20.00-99.90	0.02-0.04	Low	.10	.37		
WnA:										
Westland--------	0-12	23-27	1.40-1.60	0.60-2.00	0.20-0.23	Moderate	.24	.28	4	6
	12-20	20-40	1.40-1.65	0.60-2.00	0.13-0.19	Moderate	.28	.32		
	20-51	5-35	1.55-1.70	0.60-2.00	0.07-0.17	Low	.24	.37		
	51-80	1-10	1.70-2.10	20.00-99.90	0.01-0.04	Low	.05	.10		
WyB:										
Wynn----------	0-8	17-27	1.30-1.50	0.20-0.60	0.22-0.24	Low	.37	.37	4	6
	8-14	30-40	1.35-1.55	0.20-0.60	0.15-0.20	Moderate	.37	.37		
	14-31	30-45	1.45-1.75	0.06-0.60	0.09-0.18	High	.37	.37		
	31-35	---	---	0.00-0.20	---	---	---	---		
WyB2:										
Wynn----------	0-8	17-27	1.30-1.50	0.20-0.60	0.22-0.24	Low	.37	.37	4	6
	8-23	30-40	1.35-1.55	0.20-0.60	0.15-0.20	Moderate	.37	.37		
	23-28	35-45	1.45-1.75	0.06-0.60	0.09-0.18	High	.37	.37		
	28-38	---	---	0.00-0.20	---	---	---	---		
WyC2:										
Wynn----------	0-5	17-27	1.30-1.50	0.20-0.60	0.22-0.24	Low	.37	.37	4	6
	5-23	30-45	1.45-1.75	0.20-0.60	0.15-0.20	Moderate	.37	.37		
	23-38	---	---	0.00-0.20	---	---	---	---		
WyD2:										
Wynn----------	0-5	17-27	1.30-1.50	0.20-0.60	0.22-0.24	Low	.37	.37	4	6
	5-28	30-45	1.45-1.75	0.20-0.60	0.15-0.20	Moderate	.37	.37		
	28-38	---	---	0.00-0.20	---	---	---	---		
XeA:										
Xenia----------	0-9	11-27	1.30-1.50	0.60-2.00	0.22-0.24	Low	.37	.37	5	5
	9-38	25-37	1.45-1.65	0.60-2.00	0.18-0.20	Moderate	.37	.37		
	38-48	20-35	1.45-1.65	0.20-0.60	0.15-0.19	Moderate	.37	.43		
	48-80	12-20	1.70-1.90	0.06-0.20	0.05-0.10	Low	.37	.43		
XeB:										
Xenia----------	0-9	11-27	1.30-1.50	0.60-2.00	0.22-0.24	Low	.37	.37	5	5
	9-29	25-37	1.45-1.65	0.60-2.00	0.18-0.20	Moderate	.37	.37		
	29-58	20-35	1.45-1.65	0.20-0.60	0.15-0.19	Moderate	.37	.43		
	58-80	12-20	1.70-1.90	0.06-0.20	0.05-0.10	Low	.37	.43		

Table 30.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility	Available water capacity	Shrink-swell potential	Erosion factors Kw	Kf	T	Wind erodi-bility group
	In	Pct	g/cc	In/hr	In/in					
XeB2:										
Xenia	0-6	11-27	1.30-1.50	0.60-2.00	0.22-0.24	Low	.37	.37	5	5
	6-24	25-37	1.45-1.65	0.60-2.00	0.18-0.20	Moderate	.37	.37		
	24-44	20-35	1.45-1.65	0.20-0.60	0.15-0.19	Moderate	.37	.43		
	44-80	12-20	1.70-1.90	0.06-0.20	0.05-0.10	Low	.37	.43		
XfB:										
Xenia	0-8	11-27	1.30-1.50	0.60-2.00	0.22-0.24	Low	.37	.37	4	5
	8-26	25-37	1.45-1.65	0.60-2.00	0.18-0.20	Moderate	.37	.37		
	26-46	20-35	1.45-1.65	0.20-0.60	0.15-0.19	Moderate	.37	.43		
	46-61	12-20	1.70-1.90	0.06-0.20	0.05-0.10	Low	.37	.43		
	61-65	---	---	0.00-0.20	---	---	---	---		

TABLE 31.--CHEMICAL PROPERTIES OF THE SOILS

(Absence of an entry indicates that data were not estimated. See text on page 216 for additional information.)

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
CeA:					
Celina----------	0-10	5.6-7.3	1.0-3.0	9.0-19	0
	10-36	4.5-7.8	0.0-0.5	18-32	0-15
	36-80	7.4-8.4	0.0-0.0	8.0-14	25-45
CeB:					
Celina----------	0-9	5.6-7.3	1.0-3.0	9.0-19	0
	9-38	4.5-7.8	0.0-0.5	18-32	0-15
	38-80	7.4-8.4	0.0-0.0	8.0-14	25-45
CeB2:					
Celina----------	0-8	5.6-7.3	0.8-2.2	8.0-16	0
	8-28	4.5-7.8	0.0-0.5	18-32	0-15
	28-80	7.4-8.4	0.0-0.0	8.0-14	25-45
CoA:					
Corwin----------	0-11	5.1-7.3	2.0-4.0	10-24	0
	11-38	5.1-7.8	0.5-1.0	11-23	0-30
	38-80	7.4-8.4	0.0-0.0	4.0-17	20-30
CtA:					
Crosby----------	0-10	5.1-7.3	1.0-3.0	6.0-20	0
	10-25	5.1-7.3	0.5-1.0	15-29	0
	25-39	7.4-8.4	0.0-0.5	5.0-17	5-40
	39-80	7.4-8.4	0.0-0.0	4.0-16	20-50
Celina----------	0-8	5.6-7.3	1.0-3.0	9.0-19	0
	8-34	4.5-7.8	0.0-0.5	18-32	0-15
	34-80	7.4-8.4	0.0-0.0	8.0-14	25-45
CtB:					
Crosby----------	0-7	5.1-7.3	1.0-3.0	6.0-20	0
	7-21	5.1-7.3	0.5-1.0	15-29	0
	21-32	7.4-8.4	0.0-0.5	5.0-17	5-40
	32-80	7.4-8.4	0.0-0.0	4.0-16	20-50
Celina----------	0-10	5.6-7.3	1.0-3.0	9.0-19	0
	10-39	4.5-7.8	0.0-0.5	18-32	0-15
	39-80	7.4-8.4	0.0-0.0	8.0-14	25-45
CvA:					
Crosby----------	0-9	5.1-7.3	1.0-3.0	6.0-20	0
	9-28	5.1-7.3	0.5-1.0	15-29	0
	28-36	7.4-8.4	0.0-0.5	5.0-17	5-40
	36-80	7.4-8.4	0.0-0.0	4.0-16	20-50
Lewisburg-------	0-7	5.6-7.3	1.0-3.0	9.0-19	0
	7-19	5.6-7.8	0.0-0.5	18-32	0-15
	19-80	7.4-8.4	0.0-0.0	8.0-14	25-45
CyA:					
Cyclone---------	0-12	5.6-7.3	4.0-6.0	15-27	0
	12-50	6.1-7.3	1.0-2.0	10-22	0
	50-61	6.6-8.4	1.0-2.0	6.0-18	5-30
	61-80	7.4-8.4	0.0-1.0	4.0-14	15-40
DaA:					
Dana----------	0-11	5.6-7.3	3.0-5.0	10-25	0
	11-38	5.1-7.3	0.5-1.0	10-25	0
	38-55	6.6-8.4	0.2-0.5	10-20	0-25
	55-80	7.4-8.4	0.2-0.5	5.0-15	15-25

Table 31.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
DaB:					
Dana----------	0-10	5.6-7.3	3.0-5.0	10-25	0
	10-37	5.1-7.3	0.5-1.0	10-25	0
	37-48	6.6-8.4	0.2-0.5	10-20	0-25
	48-80	7.4-8.4	0.2-0.5	5.0-15	15-25
EeA:					
Eel----------	0-13	6.1-7.3	2.0-3.0	12-20	0
	13-37	6.1-7.8	1.0-2.0	12-20	0
	37-48	6.6-7.8	1.0-2.0	8.0-18	0-35
	48-80	7.4-8.4	0.3-0.5	8.0-18	5-35
EgA:					
Eldean----------	0-4	5.6-7.3	1.0-3.0	8.0-22	0
	4-24	5.6-7.3	0.3-1.0	20-30	0
	24-30	6.6-7.8	0.1-0.5	20-30	0-50
	30-80	7.4-8.4	0.1-0.3	1.0-8.0	40-65
EgB:					
Eldean----------	0-4	5.6-7.3	1.0-3.0	8.0-22	0
	4-22	5.6-7.3	0.3-1.0	20-30	0
	22-30	6.6-7.8	0.1-0.5	20-30	0-50
	30-80	7.4-8.4	0.1-0.3	1.0-8.0	40-65
EgB2:					
Eldean----------	0-4	5.6-7.3	0.8-2.2	6.0-20	0
	4-20	5.6-7.3	0.3-1.0	20-30	0
	20-26	6.6-7.8	0.1-0.5	20-30	0-50
	26-80	7.4-8.4	0.1-0.3	1.0-8.0	40-65
EhC3:					
Eldean----------	0-5	5.6-7.3	0.5-2.0	6.0-20	0
	5-16	5.6-7.3	0.3-1.0	20-30	0
	16-22	6.6-7.8	0.1-0.5	20-30	0-50
	22-80	7.4-8.4	0.1-0.3	1.0-8.0	40-65
EhD3:					
Eldean----------	0-5	5.6-7.3	0.5-2.0	6.0-20	0
	5-28	5.6-7.3	0.3-1.0	20-30	0
	28-35	6.6-7.8	0.1-0.5	20-30	0-50
	35-80	7.4-8.4	0.1-0.3	1.0-8.0	40-65
EkA:					
Eldean----------	0-9	5.6-7.3	1.0-3.0	8.0-21	0
	9-28	5.6-7.3	0.5-1.0	20-30	0
	28-36	6.6-7.8	0.5-1.0	20-30	0-50
	36-80	7.4-8.4	0.5-1.0	1.0-8.0	40-65
EkB:					
Eldean----------	0-7	5.6-7.3	1.0-3.0	8.0-21	0
	7-28	5.6-7.3	0.5-1.0	20-30	0
	28-34	6.6-7.8	0.5-1.0	20-30	0-50
	34-80	7.4-8.4	0.5-1.0	1.0-8.0	40-65
EkB2:					
Eldean----------	0-5	5.6-7.3	0.8-2.2	6.0-20	0
	5-24	5.6-7.3	0.5-1.0	20-30	0
	24-32	6.6-7.8	0.5-1.0	20-30	0-50
	32-80	7.4-8.4	0.5-1.0	1.0-8.0	40-65
FcA:					
Fincastle-------	0-9	5.1-7.3	1.0-3.0	6.0-20	0
	9-35	4.5-6.5	0.0-0.5	9.0-23	0
	35-46	5.1-7.8	0.0-0.3	9.0-23	0-25
	46-80	7.4-8.4	0.0-0.0	8.0-16	15-35

Table 31.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
FdA:					
Fincastle-------	0-9	5.1-7.3	1.0-3.0	6.0-20	0
	9-36	4.5-6.5	0.0-0.5	9.0-23	0
	36-43	5.1-7.8	0.0-0.3	9.0-23	0-25
	43-63	7.4-8.4	0.0-0.0	8.0-16	15-35
	63-67	---	0.0-0.0	0.0-0.0	0
FmA:					
Fox----------	0-10	5.1-7.3	1.0-3.0	4.0-20	0
	10-37	5.6-7.8	0.0-0.5	4.0-30	0-45
	37-64	7.4-8.4	0.0-0.5	0.0-3.0	5-45
	64-80	7.4-8.4	0.0-0.5	4.0-30	5-45
FmB:					
Fox----------	0-10	5.1-7.3	1.0-3.0	4.0-20	0
	10-37	5.6-7.8	0.0-0.5	4.0-30	0-45
	37-65	7.4-8.4	0.0-0.5	0.0-3.0	5-45
	65-80	7.4-8.4	0.0-0.5	4.0-30	5-45
FmB2:					
Fox----------	0-8	5.1-7.3	0.8-2.2	2.0-18	0
	8-38	5.6-7.8	0.0-0.5	4.0-30	0-45
	38-72	7.4-8.4	0.0-0.5	0.0-3.0	5-45
	72-80	7.4-8.4	0.0-0.5	4.0-30	5-45
HeF2:					
Hennepin--------	0-4	6.1-8.4	0.5-2.0	14-20	0-10
	4-16	6.1-8.4	0.1-0.5	12-22	0-35
	16-80	7.4-8.4	0.0-0.1	7.0-16	25-45
Miamian---------	0-4	5.6-7.3	0.8-2.2	10-18	0
	4-19	4.5-7.3	0.5-1.0	12-22	0
	19-29	5.1-8.4	0.3-1.0	17-28	0-15
	29-80	7.4-8.4	0.1-0.5	7.0-16	25-50
HwE2:					
Hennepin--------	0-4	6.1-8.4	0.5-2.0	14-20	0-10
	4-16	6.1-8.4	0.1-0.5	12-22	0-35
	16-80	7.4-8.4	0.0-0.1	7.0-16	25-45
Wynn----------	0-5	5.1-7.3	0.8-2.2	9.0-22	0
	5-30	6.1-8.4	0.0-0.5	18-24	0-10
	30-33	---	0.0-0.0	0.0-0.0	0
HwF2:					
Hennepin--------	0-4	6.1-8.4	0.5-2.0	14-20	0-10
	4-13	6.1-8.4	0.1-0.5	12-22	0-35
	13-80	7.4-8.4	0.0-0.1	7.0-16	25-45
Wynn----------	0-4	5.1-7.3	0.8-2.2	9.0-22	0
	4-24	6.1-8.4	0.0-0.5	18-24	0-10
	24-27	---	0.0-0.0	0.0-0.0	0
KeC2:					
Kendallville----	0-5	5.6-7.3	0.8-2.2	4.0-18	0
	5-30	5.6-7.8	0.1-0.5	10-28	0
	30-80	7.4-8.4	0.1-0.3	7.0-18	20-45
Eldean----------	0-5	5.6-7.3	0.8-2.2	8.0-21	0
	5-26	5.6-7.8	0.5-1.0	20-30	0-50
	26-80	7.4-8.4	0.5-1.0	1.0-8.0	40-65

Table 31.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
KeD2:					
Kendallville----	0-3	5.6-7.3	0.8-2.2	4.0-18	0
	3-32	5.6-7.8	0.1-0.5	10-28	0
	32-80	7.4-8.4	0.1-0.3	7.0-18	20-45
Eldean----------	0-4	5.6-7.3	0.8-2.2	8.0-21	0
	4-33	5.6-7.8	0.5-1.0	20-30	0-50
	33-80	7.4-8.4	0.5-1.0	1.0-8.0	40-65
KnA:					
Kokomo----------	0-10	5.1-7.3	3.0-6.0	14-29	0
	10-50	5.6-7.3	1.0-2.0	16-28	0
	50-68	5.6-7.8	1.0-2.0	16-28	0-20
	68-80	7.4-8.4	0.0-0.2	6.0-17	15-35
KoA:					
Kokomo----------	0-11	5.1-7.3	3.0-6.0	16-33	0
	11-41	5.6-7.3	1.0-2.0	16-28	0
	41-64	5.6-7.8	1.0-2.0	16-28	0-20
	64-80	7.4-8.4	0.0-0.2	6.0-17	15-35
LeB:					
Lewisburg-------	0-9	5.6-7.3	1.0-3.0	8.0-19	0
	9-19	5.6-7.8	0.0-0.5	14-28	0-15
	19-80	7.4-8.4	0.0-0.0	8.0-16	25-45
Celina----------	0-9	5.6-7.3	1.0-3.0	9.0-19	0
	9-34	4.5-7.8	0.5-1.0	18-32	0-15
	34-80	7.4-8.4	0.3-0.5	8.0-14	25-45
LfB2:					
Lewisburg-------	0-6	5.6-7.3	0.8-2.2	7.0-18	0
	6-19	5.6-7.8	0.0-0.5	14-28	0-15
	19-80	7.4-8.4	0.0-0.0	8.0-16	25-45
Celina----------	0-8	5.6-7.3	0.8-2.2	8.0-18	0
	8-30	4.5-7.8	0.5-1.0	18-32	0-15
	30-80	7.4-8.4	0.3-0.5	8.0-14	25-45
LgC3:					
Lewisburg-------	0-4	5.6-7.3	0.5-2.0	7.0-18	0
	4-19	5.6-7.8	0.0-0.5	14-28	0-5
	19-80	7.4-8.4	0.0-0.0	8.0-16	25-45
LpA:					
Lippincott------	0-11	6.1-7.3	4.0-8.0	20-40	0
	11-25	6.6-7.8	2.0-4.0	14-30	0-5
	25-36	7.4-8.4	0.5-2.0	2.0-10	30-55
	36-80	7.4-8.4	0.0-0.0	1.0-6.0	40-65
MaA:					
Medway----------	0-12	6.1-7.8	3.0-6.0	13-28	0
	12-38	6.1-8.4	0.5-1.0	7.0-17	0
	38-80	6.1-8.4	0.3-0.5	2.0-18	0-20
MbB2:					
Miami----------	0-5	5.6-7.3	1.0-2.0	6.0-17	0
	5-23	5.1-7.3	0.0-0.5	9.0-20	0
	23-30	6.6-8.4	0.0-0.5	4.0-11	0-20
	30-80	7.4-8.4	0.0-0.5	2.0-9.0	20-45

Table 31.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
McE2:					
Miami----------	0-5	5.6-7.3	1.0-2.0	6.0-17	0
	5-22	5.1-7.3	0.0-0.5	9.0-20	0
	22-31	6.6-8.4	0.0-0.5	4.0-11	0-20
	31-80	7.4-8.4	0.0-0.5	2.0-9.0	20-45
Kendallville----	0-5	5.6-7.3	1.0-3.0	4.0-18	0
	5-31	5.6-7.8	0.1-0.5	10-28	0
	31-80	7.4-8.4	0.1-0.3	7.0-18	20-45
McF2:					
Miami----------	0-4	5.6-7.3	1.0-2.0	6.0-17	0
	4-10	5.1-7.3	0.5-1.0	9.0-25	0
	10-22	5.1-7.3	0.0-0.5	9.0-20	0
	22-28	6.6-8.4	0.0-0.5	4.0-11	0-20
	28-80	7.4-8.4	0.0-0.5	2.0-9.0	20-45
Kendallville----	0-4	5.6-7.3	1.0-3.0	4.0-18	0
	4-40	5.6-7.8	0.1-0.5	10-28	0
	40-80	7.4-8.4	0.1-0.3	7.0-18	20-45
MdC2:					
Miami----------	0-5	5.6-7.3	1.0-2.0	6.0-17	0
	5-20	5.1-7.3	0.0-0.5	9.0-20	0
	20-26	6.6-8.4	0.0-0.5	4.0-11	0-20
	26-80	7.4-8.4	0.0-0.5	2.0-9.0	20-45
MdD2:					
Miami----------	0-5	5.6-7.3	1.0-2.0	6.0-17	0
	5-24	5.1-7.3	0.0-0.5	9.0-20	0
	24-30	6.6-8.4	0.0-0.5	4.0-11	0-20
	30-80	7.4-8.4	0.0-0.5	2.0-9.0	20-45
MeC:					
Miamian---------	0-9	5.6-7.3	1.0-3.0	10-18	0
	9-12	4.5-7.3	0.5-1.0	12-22	0
	12-24	5.1-8.4	0.3-1.0	17-28	0-15
	24-80	7.4-8.4	0.1-0.5	7.0-16	25-50
MeC2:					
Miamian---------	0-6	5.6-7.3	0.8-2.2	9.0-17	0
	6-18	4.5-7.3	0.5-1.0	12-22	0
	18-29	5.1-8.4	0.3-1.0	17-28	0-15
	29-80	7.4-8.4	0.1-0.5	7.0-16	25-50
MeD2:					
Miamian---------	0-6	5.6-7.3	0.8-2.2	9.0-17	0
	6-22	4.5-7.3	0.5-1.0	12-22	0
	22-27	5.1-8.4	0.3-1.0	17-28	0-15
	27-80	7.4-8.4	0.1-0.5	7.0-16	25-50
MfB:					
Miamian---------	0-9	5.6-7.3	1.0-3.0	10-18	0
	9-29	4.5-7.3	0.5-1.0	12-22	0
	29-35	5.1-8.4	0.3-1.0	17-28	0-15
	35-80	7.4-8.4	0.1-0.5	7.0-16	25-50
Celina----------	0-10	5.6-7.3	1.0-3.0	9.0-19	0
	10-34	4.5-7.8	0.5-1.0	18-32	0-15
	34-80	7.4-8.4	0.3-0.5	8.0-14	25-45

Table 31.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
MfB2:					
Miamian---------	0-9	5.6-7.3	0.8-2.2	9.0-17	0
	9-24	4.5-7.3	0.5-1.0	12-22	0
	24-36	5.1-8.4	0.3-1.0	17-28	0-15
	36-80	7.4-8.4	0.1-0.5	7.0-16	25-50
Celina----------	0-9	5.6-7.3	0.8-2.2	8.0-18	0
	9-33	4.5-7.8	0.5-1.0	18-32	0-15
	33-80	7.4-8.4	0.3-0.5	8.0-14	25-45
MgE2:					
Miamian---------	0-4	5.6-7.3	0.8-2.2	9.0-17	0
	4-28	4.5-7.3	0.5-1.0	12-22	0
	28-38	5.1-8.4	0.3-1.0	17-28	0-15
	38-80	7.4-8.4	0.1-0.5	7.0-16	25-50
Kendallville----	0-4	5.6-7.3	0.8-2.2	4.0-18	0
	4-29	5.6-7.8	0.1-0.5	10-28	0
	29-80	7.4-8.4	0.1-0.3	7.0-18	20-45
MgF2:					
Miamian---------	0-6	5.6-7.3	0.8-2.2	9.0-17	0
	6-23	4.5-7.3	0.5-1.0	12-22	0
	23-28	5.1-8.4	0.3-1.0	17-28	0-15
	28-80	7.4-8.4	0.1-0.5	7.0-16	25-50
Kendallville----	0-4	5.6-7.3	0.8-2.2	4.0-18	0
	4-35	5.6-7.8	0.1-0.5	10-28	0
	35-80	7.4-8.4	0.1-0.3	7.0-18	20-45
MhC3:					
Miamian---------	0-4	5.6-7.3	0.5-2.0	8.0-16	0
	4-19	4.5-7.3	0.5-1.0	12-22	0
	19-26	5.1-8.4	0.3-1.0	17-28	0-15
	26-80	7.4-8.4	0.1-0.5	7.0-16	25-50
Losantville-----	0-3	5.6-7.3	0.5-2.0	9.0-21	0
	3-19	6.1-8.4	0.0-0.5	14-28	0-5
	19-80	7.4-8.4	0.0-0.5	7.0-16	25-45
MhD3:					
Miamian---------	0-3	5.6-7.3	0.5-2.0	8.0-16	0
	3-26	4.5-7.3	0.5-1.0	12-22	0
	26-33	5.1-8.4	0.3-1.0	17-28	0-15
	33-80	7.4-8.4	0.1-0.5	7.0-16	25-50
Losantville-----	0-3	5.6-7.3	0.5-2.0	9.0-21	0
	3-14	6.1-8.4	0.0-0.5	14-28	0-5
	14-80	7.4-8.4	0.0-0.5	7.0-16	25-45
MmE2:					
Miamian---------	0-3	5.6-7.3	0.8-2.2	9.0-17	0
	3-18	4.5-7.3	0.5-1.0	12-22	0
	18-26	5.1-8.4	0.3-1.0	17-28	0-15
	26-80	7.4-8.4	0.1-0.5	7.0-16	25-50
Hennepin--------	0-4	6.1-8.4	0.5-2.0	14-20	0-10
	4-19	6.1-8.4	0.1-0.5	12-22	0-35
	19-80	7.4-8.4	0.0-0.1	7.0-16	25-45
MnE3:					
Miamian---------	0-3	5.6-7.3	0.5-2.0	9.0-17	0
	3-18	4.5-7.3	0.5-1.0	12-22	0
	18-26	5.1-8.4	0.3-1.0	17-28	0-15
	26-80	7.4-8.4	0.1-0.5	7.0-16	25-50

Table 31.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
Hennepin--------	0-4	6.1-8.4	0.5-2.0	14-20	0-10
	4-18	6.1-8.4	0.1-0.5	12-22	0-35
	18-80	7.4-8.4	0.0-0.1	7.0-16	25-45
MpA:					
Milford---------	0-10	6.1-7.3	4.0-6.0	26-36	0
	10-34	5.6-7.3	0.5-2.0	22-29	0
	34-46	6.1-7.8	0.5-2.0	22-29	0-5
	46-80	7.4-8.4	0.0-1.0	1.0-15	5-30
MrA:					
Milford---------	0-11	6.1-7.3	4.0-6.0	26-36	0
	11-24	5.6-7.3	0.5-2.0	22-29	0
	24-46	6.1-7.8	0.5-2.0	22-29	0-5
	46-73	7.4-8.4	0.0-1.0	1.0-15	5-30
	73-80	7.4-8.4	0.0-0.5	0.0-3.0	5-30
MsA:					
Millsdale-------	0-16	6.1-7.3	4.0-7.0	20-36	0
	16-25	6.1-8.4	0.5-2.0	15-30	0-15
	25-32	---	0.0-0.0	0.0-0.0	0
MtA:					
Millsdale-------	0-14	6.1-7.3	4.0-7.0	20-36	0
	14-30	6.1-8.4	0.5-2.0	15-30	0-15
	30-38	---	0.0-0.0	0.0-0.0	0
MuA:					
Milton----------	0-9	5.1-7.3	1.0-3.0	10-22	0
	9-31	4.5-7.8	0.1-0.3	16-30	5-15
	31-60	---	0.0-0.0	0.0-0.0	0
MuB:					
Milton----------	0-9	5.1-7.3	1.0-3.0	10-22	0
	9-28	4.5-7.8	0.1-0.3	16-30	5-15
	28-60	---	0.0-0.0	0.0-0.0	0
MuB2:					
Milton----------	0-5	5.1-7.3	0.8-2.2	8.0-20	0
	5-24	4.5-7.8	0.3-1.0	16-30	0
	24-28	6.1-7.8	0.1-0.3	10-27	5-15
	28-35	---	0.0-0.0	0.0-0.0	0
MuC2:					
Milton----------	0-3	5.1-7.3	0.8-2.2	8.0-20	0
	3-25	4.5-7.8	0.3-1.0	16-30	0
	25-28	6.1-7.8	0.1-0.3	10-27	5-15
	28-35	---	0.0-0.0	0.0-0.0	0
MuD2:					
Milton----------	0-5	5.1-7.3	0.8-2.2	8.0-20	0
	5-25	4.5-7.8	0.3-1.0	16-30	0
	25-29	6.1-7.8	0.1-0.3	10-27	5-15
	29-36	---	0.0-0.0	0.0-0.0	0
MuE2:					
Milton----------	0-4	5.1-7.3	0.8-2.2	8.0-20	0
	4-16	4.5-7.8	0.3-1.0	16-30	0
	16-23	6.1-7.8	0.1-0.3	10-27	5-15
	23-35	---	0.0-0.0	0.0-0.0	0

Table 31.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
MwA:					
Morningsun------	0-10	4.5-7.3	1.0-3.0	11-23	0
	10-33	4.5-7.3	0.5-1.0	10-19	0
	33-42	6.6-7.8	0.5-1.0	10-19	0
	42-51	6.6-8.4	0.2-0.5	16-23	0-5
	51-80	7.4-8.4	0.0-0.0	10-19	20-40
MxA:					
Morningsun------	0-11	4.5-7.3	1.0-3.0	11-23	0
	11-38	4.5-7.3	0.5-1.0	10-19	0
	38-45	6.6-7.8	0.5-1.0	10-19	0
	45-58	6.6-8.4	0.2-0.5	16-23	0-5
	58-80	7.4-8.4	0.0-0.0	10-19	20-40
Xenia----------	0-9	5.6-7.3	1.0-3.0	6.0-20	0
	9-30	4.5-7.3	0.2-1.0	10-23	0
	30-45	6.6-8.4	0.0-0.5	9.0-23	0-5
	45-80	7.4-8.4	0.0-0.0	4.0-13	15-40
MxB:					
Morningsun------	0-10	4.5-7.3	1.0-3.0	11-23	0
	10-34	4.5-7.3	0.5-1.0	10-19	0
	34-48	6.6-8.4	0.2-0.5	16-23	0-5
	48-80	7.4-8.4	0.0-0.0	10-19	20-40
Xenia----------	0-9	5.6-7.3	1.0-3.0	6.0-20	0
	9-30	4.5-7.3	0.2-1.0	10-23	0
	30-50	6.6-8.4	0.0-0.2	9.0-23	0-5
	50-80	7.4-8.4	0.0-0.0	4.0-13	15-40
MxB2:					
Morningsun------	0-6	4.5-7.3	0.8-2.2	10-22	0
	6-26	4.5-7.3	0.5-1.0	10-19	0
	26-31	6.6-7.8	0.5-1.0	10-19	0
	31-50	6.6-8.4	0.2-0.5	16-23	0-5
	50-80	7.4-8.4	0.0-0.0	10-19	20-40
Xenia----------	0-5	5.6-7.3	0.8-2.2	5.0-18	0
	5-28	4.5-7.3	0.2-1.0	10-23	0
	28-45	6.6-8.4	0.0-0.2	9.0-23	0-5
	45-80	7.4-8.4	0.0-0.0	4.0-13	15-40
MyA:					
Mahalasville----	0-12	6.1-7.3	2.0-5.0	17-21	0
	12-39	6.1-7.3	0.5-2.0	12-25	0
	39-44	6.6-7.8	0.5-1.0	9.0-23	0-30
	44-80	7.4-8.4	0.5-1.0	1.0-7.0	10-30
OcA:					
Ockley----------	0-9	5.6-7.3	0.5-3.0	3.0-15	0
	9-48	4.5-7.3	0.0-0.5	2.0-15	0
	48-80	7.4-8.4	0.0-0.2	1.0-3.0	10-40
OcB:					
Ockley----------	0-9	5.6-7.3	0.5-3.0	3.0-15	0
	9-50	4.5-7.3	0.0-0.5	2.0-15	0
	50-80	7.4-8.4	0.0-0.2	1.0-3.0	10-40
Pg:					
Pits, gravel----	---	---	---	---	---
Pq:					
Pits, quarry----	---	---	---	---	---

Table 31.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
PtB:					
Plattville------	0-18	5.6-7.3	2.0-4.0	10-24	0
	18-43	5.6-7.8	0.5-1.0	11-23	0
	43-54	6.6-8.4	0.0-0.0	4.0-17	0-30
	54-57	---	0.0-0.0	0.0-0.0	0
RaA:					
Rainsville------	0-8	5.1-7.3	1.0-3.0	7.0-21	0
	8-15	5.1-7.3	0.5-1.0	11-20	0
	15-35	4.5-6.0	0.5-1.0	13-22	0
	35-55	6.6-7.8	0.5-1.0	13-22	0-15
	55-80	7.4-8.4	0.0-0.5	6.0-14	15-40
RaB:					
Rainsville------	0-10	5.1-7.3	1.0-3.0	6.0-20	0
	10-16	5.1-7.3	0.5-1.0	11-20	0
	16-44	4.5-6.0	0.5-1.0	13-22	0
	44-50	6.6-7.8	0.5-1.0	13-22	0-15
	50-80	7.4-8.4	0.0-0.5	6.0-14	15-40
RaB2:					
Rainsville------	0-6	5.1-7.3	0.8-2.2	7.0-21	0
	6-36	4.5-6.0	0.5-1.0	13-22	0
	36-52	6.6-7.8	0.5-1.0	13-22	0-15
	52-80	7.4-8.4	0.0-0.5	6.0-14	15-40
RcA:					
Randolph--------	0-10	4.5-7.3	1.0-3.0	8.0-22	0
	10-27	4.5-7.8	0.5-1.0	14-30	0
	27-33	6.6-8.4	0.0-0.0	8.0-20	0-15
	33-35	---	0.0-0.0	0.0-0.0	0
RcB:					
Randolph--------	0-8	4.5-7.3	1.0-3.0	8.0-22	0
	8-23	4.5-7.8	0.5-1.0	14-30	0
	23-32	6.6-8.4	0.0-0.0	8.0-20	0-15
	32-35	---	0.0-0.0	0.0-0.0	0
RnE2:					
Rodman----------	0-8	6.6-7.8	2.0-4.0	5.0-18	0-15
	8-12	6.6-7.8	0.0-2.0	1.0-14	0-25
	12-80	7.4-8.4	0.0-1.0	1.0-6.0	10-45
RnF2:					
Rodman----------	0-4	6.6-7.8	2.0-4.0	5.0-18	0-15
	4-12	6.6-7.8	0.0-2.0	1.0-14	0-25
	12-80	7.4-8.4	0.0-1.0	1.0-6.0	10-45
RoE2:					
Rodman----------	0-8	6.6-7.8	2.0-4.0	5.0-18	0-15
	8-12	6.6-7.8	0.0-2.0	1.0-14	0-25
	12-80	7.4-8.4	0.0-1.0	1.0-6.0	10-45
Kendallville----	0-12	5.6-7.3	0.8-2.2	4.0-18	0
	12-49	5.6-7.8	0.1-0.5	10-28	0
	49-80	7.4-8.4	0.1-0.3	7.0-18	20-45
RoF2:					
Rodman----------	0-4	6.6-7.8	2.0-4.0	5.0-18	0-15
	4-12	6.6-7.8	0.0-2.0	1.0-14	0-25
	12-80	7.4-8.4	0.0-1.0	1.0-6.0	10-45
Kendallville----	0-7	5.6-7.3	0.8-2.2	4.0-18	0
	7-40	5.6-7.8	0.1-0.5	10-28	0
	40-80	7.4-8.4	0.1-0.3	7.0-18	20-45

Table 31.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
RpA:					
Rossburg--------	0-18	6.1-7.8	4.0-8.0	13-32	0
	18-35	6.1-7.8	0.5-2.0	8.0-22	0
	35-52	6.6-8.4	0.5-2.0	2.0-15	0-30
	52-80	6.6-8.4	0.5-2.0	2.0-8.0	0-30
RuB:					
Russell---------	0-8	5.1-7.3	0.5-2.0	5.0-19	0
	8-35	4.5-7.3	0.5-1.0	11-22	0
	35-58	5.1-7.3	0.0-1.0	9.0-22	0
	58-80	7.4-8.4	0.0-0.5	5.0-18	15-35
Miamian---------	0-5	5.6-7.3	1.0-3.0	10-18	0
	5-10	4.5-7.3	0.5-1.0	12-22	0
	10-32	5.1-8.4	0.3-1.0	17-28	0-15
	32-80	7.4-8.4	0.1-0.5	7.0-16	25-50
RuB2:					
Russell---------	0-6	5.1-7.3	0.5-2.0	4.0-18	0
	6-32	4.5-7.3	0.5-1.0	11-22	0
	32-50	5.1-7.3	0.0-1.0	9.0-22	0
	50-80	7.4-8.4	0.0-0.5	5.0-18	15-35
Miamian---------	0-4	5.6-7.3	0.8-2.2	9.0-17	0
	4-26	4.5-7.3	0.5-1.0	12-22	0
	26-33	5.1-8.4	0.3-1.0	17-28	0-15
	33-80	7.4-8.4	0.1-0.5	7.0-16	25-50
SeA:					
Savona----------	0-7	5.6-7.3	0.5-3.0	10-21	0
	7-29	5.6-7.3	0.1-0.5	14-25	0-5
	29-45	7.4-8.4	0.0-0.0	8.0-18	30-55
	45-80	7.4-8.4	0.0-0.0	1.0-6.0	40-65
SnA:					
Sloan----------	0-10	6.1-7.8	3.0-6.0	13-26	0
	10-45	6.6-8.4	0.5-2.0	10-20	0-10
	45-60	6.6-8.4	0.5-2.0	4.0-18	0-25
	60-80	6.6-8.4	0.5-2.0	2.0-8.0	0-30
StA:					
Stonelick-------	0-10	7.4-8.4	0.5-2.0	12-18	10-25
	10-30	7.4-8.4	0.0-0.1	8.0-12	25-50
	30-80	7.4-8.4	0.0-0.1	6.0-10	25-50
SvA:					
Sugarvalley-----	0-10	4.5-7.3	1.0-3.0	10-26	0
	10-41	5.1-7.3	0.5-1.0	12-25	0
	41-51	6.6-7.8	0.5-1.0	10-19	0
	51-61	6.6-8.4	0.2-0.5	8.0-15	0-5
	61-80	7.4-8.4	0.0-0.0	5.0-15	20-40
SwA:					
Sugarvalley-----	0-9	4.5-7.3	1.0-3.0	10-26	0
	9-30	5.1-7.3	0.5-1.0	12-25	0
	30-50	6.6-7.8	0.5-1.0	10-19	0
	50-80	7.4-8.4	0.0-0.0	5.0-15	20-40
Fincastle-------	0-11	5.1-7.3	1.0-3.0	6.0-20	0
	11-32	4.5-6.5	0.0-0.5	9.0-23	0
	32-48	5.1-7.8	0.0-0.0	10-20	0-25
	48-80	7.4-8.4	0.0-0.0	8.0-16	15-35

Table 31.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
ThA:					
Thackery--------	0-12	5.6-7.3	1.0-3.0	8.0-21	0
	12-21	5.1-6.5	0.1-0.5	8.0-20	0
	21-54	5.1-7.8	0.0-0.0	10-21	0-15
	54-80	7.4-8.4	0.0-0.0	1.0-6.0	10-40
ThB:					
Thackery--------	0-12	5.6-7.3	1.0-3.0	8.0-21	0
	12-67	5.1-7.8	0.0-0.0	10-21	0-15
	67-80	7.4-8.4	0.0-0.0	1.0-6.0	10-40
Ud:					
Udorthents------	---	---	---	---	---
W:					
Water----------	---	---	---	---	---
WbA:					
Warsaw----------	0-12	5.6-7.3	2.0-5.0	10-25	0
	12-21	5.1-6.5	0.5-2.0	7.0-22	0
	21-30	6.1-8.4	0.5-2.0	9.0-22	0-10
	30-80	7.4-8.4	0.0-1.0	1.0-7.0	15-25
WnA:					
Westland--------	0-12	6.1-7.3	2.0-5.0	15-31	0
	12-20	6.1-7.3	0.5-2.0	9.0-22	0
	20-51	6.1-7.8	0.5-2.0	5.0-18	0-25
	51-80	7.4-8.4	0.0-0.5	0.0-2.0	25-45
WyB:					
Wynn----------	0-8	5.1-7.3	1.0-3.0	9.0-22	0
	8-14	5.1-6.5	0.0-0.5	18-24	0
	14-31	6.1-8.4	0.0-0.0	16-24	0-15
	31-35	---	0.0-0.0	0.0-0.0	0
WyB2:					
Wynn----------	0-8	5.1-7.3	0.8-2.2	8.0-21	0
	8-23	5.1-6.5	0.0-0.5	18-24	0
	23-28	6.1-8.4	0.0-0.0	16-24	0-15
	28-38	---	0.0-0.0	0.0-0.0	0
WyC2:					
Wynn----------	0-5	5.1-7.3	0.8-2.2	8.0-21	0
	5-23	6.1-8.4	0.0-0.5	18-24	0-10
	23-38	---	---	0.0-0.0	0
WyD2:					
Wynn----------	0-5	5.1-7.3	0.8-2.2	8.0-21	0
	5-28	6.1-8.4	0.0-0.5	18-24	0-10
	28-38	---	0.0-0.0	0.0-0.0	0
XeA:					
Xenia----------	0-9	5.6-7.3	1.0-3.0	6.0-20	0
	9-38	4.5-7.3	0.2-1.0	10-23	0
	38-48	6.6-8.4	0.0-0.5	9.0-23	0-25
	48-80	7.4-8.4	0.0-0.0	4.0-13	15-40
XeB:					
Xenia----------	0-9	5.6-7.3	1.0-3.0	6.0-20	0
	9-29	4.5-7.3	0.2-1.0	10-23	0
	29-58	6.6-8.4	0.0-0.5	9.0-23	0-25
	58-80	7.4-8.4	0.0-0.0	4.0-13	15-40

Table 31.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
XeB2:					
Xenia	0-6	5.6-7.3	0.8-2.2	5.0-19	0
	6-24	4.5-7.3	0.2-1.0	10-23	0
	24-44	6.6-8.4	0.0-0.5	9.0-23	0-25
	44-80	7.4-8.4	0.0-0.0	4.0-13	15-40
XfB:					
Xenia	0-8	5.6-7.3	1.0-3.0	6.0-20	0
	8-26	4.5-7.3	0.2-1.0	10-23	0
	26-46	6.6-8.4	0.0-0.5	9.0-23	0-25
	46-61	7.4-8.4	0.0-0.0	4.0-13	15-40
	61-65	---	0.0-0.0	0.0-0.0	0

TABLE 32.--WATER FEATURES

(Depths of layers are in feet. See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated. See text on page 216 for additional information.)

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
CeA:										
Celina----------	C	Jan-Apr	1.5-3.0	1.6-3.5	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
CeB:										
Celina----------	C	Jan-Apr	1.5-3.0	1.6-3.5	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
CeB2:										
Celina----------	C	Jan-Apr	1.5-3.0	1.6-3.5	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
CoA:										
Corwin----------	B	Jan-Apr	1.5-2.5	2.0-3.5	Perched	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	1.5-2.5	2.0-3.5	Perched	---	---	None	---	None
CtA:										
Crosby----------	C	Jan-Apr	0.5-1.5	1.0-2.0	Perched	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	0.5-1.5	1.0-2.0	Perched	---	---	None	---	None
Celina----------	C	Jan-Apr	1.5-3.0	1.6-3.5	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
CtB:										
Crosby----------	C	Jan-Apr	0.5-1.5	1.0-2.0	Perched	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	0.5-1.5	1.0-2.0	Perched	---	---	None	---	None
Celina----------	C	Jan-Apr	1.5-3.0	1.6-3.5	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
CvA:										
Crosby----------	C	Jan-Apr	0.5-1.5	1.0-2.0	Perched	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	0.5-1.5	1.0-2.0	Perched	---	---	None	---	None
Lewisburg-------	C	Jan-Apr	0.5-2.0	1.5-3.5	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
CyA:										
Cyclone---------	B	Jan-May	0.0-0.5	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Jun-Nov	---	---	---	---	---	None	---	None
		Dec	0.0-0.5	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
DaA:										
Dana----------	B	Jan	---	---	---	---	---	None	---	None
		Feb-Apr	2.0-3.0	3.5-6.0	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
DaB:										
Dana----------	B	Jan	---	---	---	---	---	None	---	None
		Feb-Apr	2.0-3.0	3.5-6.0	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
EeA:										
Eel----------	A	Jan-Apr	1.5-2.0	>6.0	Apparent	---	---	None	Brief	Occasional
		May-Jun	---	---	---	---	---	None	Brief	Occasional
		Jul-Nov	---	---	---	---	---	None	---	None
		Dec	1.5-2.0	>6.0	Apparent	---	---	None	Brief	Occasional
EgA:										
Eldean----------	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
EgB:										
Eldean----------	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
EgB2:										
Eldean----------	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None

Table 32.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
EhC3:										
Eldean----------	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
EhD3:										
Eldean----------	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
EkA:										
Eldean----------	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
EkB:										
Eldean----------	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
EkB2:										
Eldean----------	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
FcA:										
Fincastle-------	C	Jan-Apr	0.5-1.5	1.0-2.0	Perched	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	0.5-1.5	1.0-2.0	Perched	---	---	None	---	None
FdA:										
Fincastle-------	C	Jan-Apr	0.5-1.5	1.0-2.0	Perched	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	0.5-1.5	1.0-2.0	Perched	---	---	None	---	None
FmA:										
Fox----------	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
FmB:										
Fox----------	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
FmB2:										
Fox----------	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
HeF2:										
Hennepin--------	C	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Miamian---------	C	Jan-May	2.5-3.5	3.0-4.0	Perched	---	---	None	---	None
		Jun-Dec	---	---	---	---	---	None	---	None
HwE2:										
Hennepin--------	C	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Wynn----------	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
HwF2:										
Hennepin--------	C	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Wynn----------	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
KeC2:										
Kendallville----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Eldean----------	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
KeD2:										
Kendallville----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Eldean----------	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
KnA:										
Kokomo----------	B	Jan-May	0.0-0.5	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun-Nov	---	---	---	---	---	None	---	None
		Dec	0.0-0.5	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
KoA:										
Kokomo----------	B	Jan-May	0.0-0.5	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun-Nov	---	---	---	---	---	None	---	None
		Dec	0.0-0.5	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
LeB:										
Lewisburg-------	C	Jan-Apr	0.5-2.0	1.5-3.5	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
Celina----------	C	Jan-Apr	1.5-3.0	1.6-3.5	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None

Table 32.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
LfB2:										
Lewisburg-------	C	Jan-Apr	0.5-2.0	1.5-3.5	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
Celina----------	C	Jan-Apr	1.5-3.0	1.6-3.5	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
LgC3:										
Lewisburg-------	C	Jan-Apr	0.5-2.0	1.5-3.5	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
LpA:										
Lippincott------	B	Jan-May	0.0-0.5	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun-Nov	---	---	---	---	---	None	---	None
		Dec	0.0-0.5	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
MaA:										
Medway----------	B	Jan-Mar	2.0-3.0	>6.0	Apparent	---	---	None	Brief	Occasional
		Apr-Jun	---	---	---	---	---	None	Brief	Occasional
		Jul-Oct	---	---	---	---	---	None	---	None
		Nov	---	---	---	---	---	None	Brief	Occasional
		Dec	2.0-3.0	>6.0	Apparent	---	---	None	Brief	Occasional
MbB2:										
Miami-----------	B	Jan-Apr	2.0-3.0	2.5-3.5	Perched	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	2.0-3.0	2.5-3.5	Perched	---	---	None	---	None
McE2:										
Miami-----------	B	Jan-Apr	2.0-3.0	2.5-3.5	Perched	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	2.0-3.0	2.5-3.5	Perched	---	---	None	---	None
Kendallville----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
McF2:										
Miami-----------	B	Jan-Apr	2.0-3.0	2.5-3.5	Perched	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	2.0-3.0	2.5-3.5	Perched	---	---	None	---	None
Kendallville----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
MdC2:										
Miami-----------	B	Jan-Apr	2.0-3.0	2.5-3.5	Perched	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	2.0-3.0	2.5-3.5	Perched	---	---	None	---	None
MdD2:										
Miami-----------	B	Jan-Apr	2.0-3.0	2.5-3.5	Perched	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	2.0-3.0	2.5-3.5	Perched	---	---	None	---	None
MeC:										
Miamian---------	C	Jan-May	2.5-3.5	3.0-4.0	Perched	---	---	None	---	None
		Jun-Dec	---	---	---	---	---	None	---	None
MeC2:										
Miamian---------	C	Jan-May	2.5-3.5	3.0-4.0	Perched	---	---	None	---	None
		Jun-Dec	---	---	---	---	---	None	---	None
MeD2:										
Miamian---------	C	Jan-May	2.5-3.5	3.0-4.0	Perched	---	---	None	---	None
		Jun-Dec	---	---	---	---	---	None	---	None
MfB:										
Miamian---------	C	Jan-May	2.5-3.5	3.0-4.0	Perched	---	---	None	---	None
		Jun-Dec	---	---	---	---	---	None	---	None
Celina----------	C	Jan-Apr	1.5-3.0	1.6-3.5	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
MfB2:										
Miamian---------	C	Jan-May	2.5-3.5	3.0-4.0	Perched	---	---	None	---	None
		Jun-Dec	---	---	---	---	---	None	---	None

Table 32.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
Celina----------	C	Jan-Apr	1.5-3.0	1.6-3.5	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
MgE2:										
Miamian---------	C	Jan-May	2.5-3.5	3.0-4.0	Perched	---	---	None	---	None
		Jun-Dec	---	---	---	---	---	None	---	None
Kendallville----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
MgF2:										
Miamian---------	C	Jan-May	2.5-3.5	3.0-4.0	Perched	---	---	None	---	None
		Jun-Dec	---	---	---	---	---	None	---	None
Kendallville----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
MhC3:										
Miamian---------	C	Jan-May	2.5-3.5	3.0-4.0	Perched	---	---	None	---	None
		Jun-Dec	---	---	---	---	---	None	---	None
Losantville-----	C	Jan-Apr	1.0-2.0	3.0-4.0	Perched	---	---	None	---	None
		May-Oct	---	---	---	---	---	None	---	None
		Nov-Dec	1.0-2.0	3.0-4.0	Perched	---	---	None	---	None
MhD3:										
Miamian---------	C	Jan-May	2.5-3.5	3.0-4.0	Perched	---	---	None	---	None
		Jun-Dec	---	---	---	---	---	None	---	None
Losantville-----	C	Jan-Apr	1.0-2.0	3.0-4.0	Perched	---	---	None	---	None
		May-Oct	---	---	---	---	---	None	---	None
		Nov-Dec	1.0-2.0	3.0-4.0	Perched	---	---	None	---	None
MmE2:										
Miamian---------	C	Jan-May	2.5-3.5	3.0-4.0	Perched	---	---	None	---	None
		Jun-Dec	---	---	---	---	---	None	---	None
Hennepin--------	C	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
MnE3:										
Miamian---------	C	Jan-May	2.5-3.5	3.0-4.0	Perched	---	---	None	---	None
		Jun-Dec	---	---	---	---	---	None	---	None
Hennepin--------	C	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
MpA:										
Milford---------	B	Jan-May	0.0-1.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Jun-Nov	---	---	---	---	---	None	---	None
		Dec	0.0-1.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
MrA:										
Milford---------	B	Jan-May	0.0-1.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Jun-Nov	---	---	---	---	---	None	---	None
		Dec	0.0-1.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
MsA:										
Millsdale-------	B/D	Jan-May	0.0-1.0	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun-Oct	---	---	---	---	---	None	---	None
		Nov-Dec	0.0-1.0	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
MtA:										
Millsdale-------	B/D	Jan-May	0.0-1.0	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun-Oct	---	---	---	---	---	None	---	None
		Nov-Dec	0.0-1.0	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
MuA:										
Milton----------	C	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
MuB:										
Milton----------	C	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
MuB2:										
Milton----------	C	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
MuC2:										
Milton----------	C	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None

Table 32.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
MuD2:										
Milton----------	C	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
MuE2:										
Milton----------	C	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
MwA:										
Morningsun------	B	Jan-Apr	2.0-3.5	>6.0	Apparent	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	2.0-3.5	>6.0	Apparent	---	---	None	---	None
MxA:										
Morningsun------	B	Jan-Apr	2.0-3.5	>6.0	Apparent	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	2.0-3.5	>6.0	Apparent	---	---	None	---	None
Xenia-----------	B	Jan-Apr	1.5-2.5	4.0-6.0	Perched	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	1.5-2.5	4.0-6.0	Perched	---	---	None	---	None
MxB:										
Morningsun------	B	Jan-Apr	2.0-3.5	>6.0	Apparent	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	2.0-3.5	>6.0	Apparent	---	---	None	---	None
Xenia-----------	B	Jan-Apr	1.5-2.5	4.0-6.0	Perched	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	1.5-2.5	4.0-6.0	Perched	---	---	None	---	None
MxB2:										
Morningsun------	B	Jan-Apr	2.0-3.5	>6.0	Apparent	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	2.0-3.5	>6.0	Apparent	---	---	None	---	None
Xenia-----------	B	Jan-Apr	1.5-2.5	4.0-6.0	Perched	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	1.5-2.5	4.0-6.0	Perched	---	---	None	---	None
MyA:										
Mahalasville----	B	Jan-May	0.0-0.5	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Jun-Nov	---	---	---	---	---	None	---	None
		Dec	0.0-0.5	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
OcA:										
Ockley----------	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
OcB:										
Ockley----------	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Pg:										
Pits, gravel----	---	Jan-Dec	---	---	---	---	---	---	---	None
Pq:										
Pits, quarry----	---	Jan-Dec	---	---	---	---	---	---	---	None
PtB:										
Plattville------	B	Jan-Apr	2.5-3.5	>6.0	Apparent	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	2.5-3.5	>6.0	Apparent	---	---	None	---	None
RaA:										
Rainsville------	B	Jan-Apr	2.0-3.5	4.0-5.0	Perched	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	2.0-3.5	4.0-5.0	Perched	---	---	None	---	None
RaB:										
Rainsville------	B	Jan-Apr	2.0-3.5	4.0-5.0	Perched	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	2.0-3.5	4.0-5.0	Perched	---	---	None	---	None
RaB2:										
Rainsville------	B	Jan-Apr	2.0-3.5	4.0-5.0	Perched	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	2.0-3.5	4.0-5.0	Perched	---	---	None	---	None

Table 32.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
RcA:										
Randolph--------	C	Jan-Apr	0.5-1.0	>6.0	Apparent	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
RcB:										
Randolph--------	C	Jan-Apr	0.5-1.0	>6.0	Apparent	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
RnE2:										
Rodman----------	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
RnF2:										
Rodman----------	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
RoE2:										
Rodman----------	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Kendallville----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
RoF2:										
Rodman----------	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Kendallville----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
RpA:										
Rossburg--------	B	Jan-Apr	3.5-6.0	>6.0	Apparent	---	---	None	Brief	Occasional
		May	---	---	---	---	---	None	Brief	Occasional
		Jun-Oct	---	---	---	---	---	None	---	None
		Nov-Dec	---	---	---	---	---	None	Brief	Occasional
RuB:										
Russell---------	B	Jan-Apr	3.5-6.0	4.0-6.0	Perched	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	3.5-6.0	4.0-6.0	Perched	---	---	None	---	None
Miamian---------	C	Jan-May	2.5-3.5	3.0-4.0	Perched	---	---	None	---	None
		Jun-Dec	---	---	---	---	---	None	---	None
RuB2:										
Russell---------	B	Jan-Apr	3.5-6.0	4.0-6.0	Perched	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	3.5-6.0	4.0-6.0	Perched	---	---	None	---	None
Miamian---------	C	Jan-May	2.5-3.5	3.0-4.0	Perched	---	---	None	---	None
		Jun-Dec	---	---	---	---	---	None	---	None
SeA:										
Savona----------	C	Jan-Apr	0.5-2.5	>6.0	Apparent	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	0.5-2.5	>6.0	Apparent	---	---	None	---	None
SnA:										
Sloan-----------	B	Jan-Jun	0.0-1.0	>6.0	Apparent	0.0-1.0	Long	Frequent	Long	Frequent
		Jul-Oct	---	---	---	---	---	None	---	None
		Nov-Dec	0.0-1.0	>6.0	Apparent	0.0-1.0	Long	Frequent	Long	Frequent
StA:										
Stonelick-------	B	Jan-Jun	---	---	---	---	---	None	Brief	Frequent
		Jul-Oct	---	---	---	---	---	None	---	None
		Nov-Dec	---	---	---	---	---	None	Brief	Frequent
SvA:										
Sugarvalley-----	C	Jan-Apr	0.5-2.0	>6.0	Apparent	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	0.5-2.0	>6.0	Apparent	---	---	None	---	None
SwA:										
Sugarvalley-----	C	Jan-Apr	0.5-2.0	>6.0	Apparent	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	0.5-2.0	>6.0	Apparent	---	---	None	---	None
Fincastle-------	C	Jan-Apr	0.5-1.5	1.0-2.0	Perched	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	0.5-1.5	1.0-2.0	Perched	---	---	None	---	None

Table 32.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
ThA:										
Thackery--------	B	Jan-May	1.0-2.5	>6.0	Apparent	---	---	None	---	None
		Jun-Nov	---	---	---	---	---	None	---	None
		Dec	1.0-2.5	>6.0	Apparent	---	---	None	---	None
ThB:										
Thackery--------	B	Jan-May	2.5-3.5	>6.0	Apparent	---	---	None	---	None
		Jun-Nov	---	---	---	---	---	None	---	None
		Dec	2.5-3.5	>6.0	Apparent	---	---	None	---	None
Ud:										
Udorthents------	---	Jan-Dec	---	---	---	---	---	---	---	None
WbA:										
Warsaw----------	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
WnA:										
Westland--------	B	Jan-May	0.0-0.5	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Jun-Nov	---	---	---	---	---	None	---	None
		Dec	0.0-0.5	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
WyB:										
Wynn----------	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
WyB2:										
Wynn----------	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
WyC2:										
Wynn----------	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
WyD2:										
Wynn----------	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
XeA:										
Xenia-----------	B	Jan-Apr	1.5-2.5	4.0-6.0	Perched	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	1.5-2.5	4.0-6.0	Perched	---	---	None	---	None
XeB:										
Xenia-----------	B	Jan-Apr	1.5-2.5	4.0-6.0	Perched	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	1.5-2.5	4.0-6.0	Perched	---	---	None	---	None
XeB2:										
Xenia-----------	B	Jan-Apr	1.5-2.5	4.0-6.0	Perched	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	1.5-2.5	4.0-6.0	Perched	---	---	None	---	None
XfB:										
Xenia-----------	B	Jan-Apr	1.5-2.5	4.0-6.0	Perched	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	1.5-2.5	4.0-6.0	Perched	---	---	None	---	None

TABLE 33.--SOIL FEATURES

(See text on page 217 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: 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			
CeA:									
Celina	Dense material	20- 40	---	Noncemented	---	---	High	High	Moderate.
CeB:									
Celina	Dense material	20- 40	---	Noncemented	---	---	High	High	Moderate.
CeB2:									
Celina	Dense material	20- 40	---	Noncemented	---	---	High	High	Moderate.
CoA:									
Corwin	Dense material	20- 40	---	Noncemented	---	---	Moderate	High	Moderate.
CtA:									
Crosby	Dense material	20- 40	---	Noncemented	---	---	High	High	Moderate.
Celina	Dense material	20- 40	---	Noncemented	---	---	High	High	Moderate.
CtB:									
Crosby	Dense material	20- 40	---	Noncemented	---	---	High	High	Moderate.
Celina	Dense material	20- 40	---	Noncemented	---	---	High	High	Moderate.
CvA:									
Crosby	Dense material	20- 40	---	Noncemented	---	---	High	High	Moderate.
Lewisburg	Dense material	10- 20	---	Noncemented	---	---	High	High	Moderate.
CyA:									
Cyclone	---	> 80	---	---	---	---	High	High	Low.
DaA:									
Dana	Dense material	40- 70	---	Noncemented	---	---	High	Moderate	Moderate.
DaB:									
Dana	Dense material	40- 70	---	Noncemented	---	---	High	Moderate	Moderate.
EeA:									
Eel	---	> 80	---	---	---	---	High	Moderate	Low.
EgA:									
Eldean	Strongly contrasting textural stratification	20- 40	---	Noncemented	---	---	Moderate	High	Moderate.
EgB:									
Eldean	Strongly contrasting textural stratification	20- 40	---	Noncemented	---	---	Moderate	High	Moderate.
EgB2:									
Eldean	Strongly contrasting textural stratification	20- 40	---	Noncemented	---	---	Moderate	High	Moderate.
EhC3:									
Eldean	Strongly contrasting textural stratification	20- 40	---	Noncemented	---	---	Moderate	High	Moderate.
EhD3:									
Eldean	Strongly contrasting textural stratification	20- 40	---	Noncemented	---	---	Moderate	High	Moderate.

Table 33.--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			
EkA:									
Eldean	Strongly contrasting textural stratification	20- 40	---	Noncemented	---	---	Moderate	High	Moderate.
EkB:									
Eldean	Strongly contrasting textural stratification	20- 40	---	Noncemented	---	---	Moderate	High	Moderate.
EkB2:									
Eldean	Strongly contrasting textural stratification	20- 40	---	Noncemented	---	---	Moderate	High	Moderate.
FcA:									
Fincastle	Dense material	40- 60	---	Noncemented	---	---	High	High	Moderate.
FdA:									
Fincastle	Dense material	40- 60	---	Noncemented	---	---	High	High	Moderate.
	Bedrock (paralithic)	55- 65		Moderately cemented					
FmA:									
Fox	Strongly contrasting textural stratification	24- 40	---	Noncemented	---	---	Moderate	Moderate	Moderate.
FmB:									
Fox	Strongly contrasting textural stratification	24- 40	---	Noncemented	---	---	Moderate	Moderate	Moderate.
FmB2:									
Fox	Strongly contrasting textural stratification	24- 40	---	Noncemented	---	---	Moderate	Moderate	Moderate.
HeF2:									
Hennepin	Dense material	10- 20	---	Noncemented	---	---	Moderate	Low	Low.
Miamian	Dense material	20- 40	---	Noncemented	---	---	Moderate	Moderate	Moderate.
HwE2:									
Hennepin	Dense material	10- 20	---	Noncemented	---	---	Moderate	Low	Low.
Wynn	Bedrock (paralithic)	20- 40	---	Moderately cemented	---	---	Moderate	High	Low.
HwF2:									
Hennepin	Dense material	10- 20	---	Noncemented	---	---	Moderate	Low	Low.
Wynn	Bedrock (paralithic)	20- 40	---	Moderately cemented	---	---	Moderate	High	Low.
KeC2:									
Kendallville	Dense material	20- 40	---	Noncemented	---	---	Moderate	Moderate	Moderate.
Eldean	Strongly contrasting textural stratification	20- 40	---	Noncemented	---	---	Moderate	High	Moderate.
KeD2:									
Kendallville	Dense material	20- 40	---	Noncemented	---	---	Moderate	Moderate	Moderate.
Eldean	Strongly contrasting textural stratification	20- 40	---	Noncemented	---	---	Moderate	High	Moderate.

Table 33.--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			
KnA:									
Kokomo	---	> 80	---	---	---	---	High	High	Low.
KoA:									
Kokomo	---	> 80	---	---	---	---	High	High	Low.
LeB:									
Lewisburg	Dense material	10- 20	---	Noncemented	---	---	High	Moderate	Moderate.
Celina	Dense material	20- 40	---	Noncemented	---	---	High	High	Moderate.
LfB2:									
Lewisburg	Dense material	10- 20	---	Noncemented	---	---	High	Moderate	Moderate.
Celina	Dense material	20- 40	---	Noncemented	---	---	High	High	Moderate.
LgC3:									
Lewisburg	Dense material	10- 20	---	Noncemented	---	---	High	Moderate	Moderate.
LpA:									
Lippincott	Strongly contrasting textural stratification	20- 40	---	Noncemented	---	---	High	High	Low.
MaA:									
Medway	---	> 80	---	---	---	---	High	High	Low.
MbB2:									
Miami	Dense material	24- 40	---	Noncemented	---	---	Moderate	Moderate	Low.
McE2:									
Miami	Dense material	24- 40	---	Noncemented	---	---	Moderate	Moderate	Low.
Kendallville	Dense material	20- 40	---	Noncemented	---	---	Moderate	Moderate	Moderate.
McF2:									
Miami	Dense material	24- 40	---	Noncemented	---	---	Moderate	Moderate	Low.
Kendallville	Dense material	20- 43	---	Noncemented	---	---	Moderate	Moderate	Moderate.
MdC2:									
Miami	Dense material	24- 40	---	Noncemented	---	---	Moderate	Moderate	Low.
MdD2:									
Miami	Dense material	24- 40	---	Noncemented	---	---	Moderate	Moderate	Low.
MeC:									
Miamian	Dense material	20- 40	---	Noncemented	---	---	Moderate	Moderate	Moderate.
MeC2:									
Miamian	Dense material	20- 40	---	Noncemented	---	---	Moderate	Moderate	Moderate.
MeD2:									
Miamian	Dense material	20- 40	---	Noncemented	---	---	Moderate	Moderate	Moderate.
MfB:									
Miamian	Dense material	20- 40	---	Noncemented	---	---	Moderate	Moderate	Moderate.
Celina	Dense material	20- 40	---	Noncemented	---	---	High	High	Moderate.
MfB2:									
Miamian	Dense material	20- 40	---	Noncemented	---	---	Moderate	Moderate	Moderate.
Celina	Dense material	20- 40	---	Noncemented	---	---	High	High	Moderate.
MgE2:									
Miamian	Dense material	20- 40	---	Noncemented	---	---	Moderate	Moderate	Moderate.
Kendallville	Dense material	20- 40	---	Noncemented	---	---	Moderate	Moderate	Moderate.
MgF2:									
Miamian	Dense material	20- 40	---	Noncemented	---	---	Moderate	Moderate	Moderate.
Kendallville	Dense material	20- 40	---	Noncemented	---	---	Moderate	Moderate	Moderate.

Table 33.--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			
MhC3:									
Miamian	Dense material	20- 40	---	Noncemented	---	---	Moderate	Moderate	Moderate.
Losantville	Dense material	12- 20	---	Noncemented	---	---	Moderate	Moderate	Low.
MhD3:									
Miamian	Dense material	20- 40	---	Noncemented	---	---	Moderate	Moderate	Moderate.
Losantville	Dense material	12- 20	---	Noncemented	---	---	Moderate	Moderate	Low.
MmE2:									
Miamian	Dense material	20- 40	---	Noncemented	---	---	Moderate	Moderate	Moderate.
Hennepin	Dense material	10- 20	---	Noncemented	---	---	Moderate	Low	Low.
MnE3:									
Miamian	Dense material	20- 40	---	Noncemented	---	---	Moderate	Moderate	Moderate.
Hennepin	Dense material	10- 20	---	Noncemented	---	---	Moderate	Low	Low.
MpA:									
Milford	---	> 80	---	---	---	---	High	High	Low.
MrA:									
Milford	---	> 80	---	---	---	---	High	High	Low.
MsA:									
Millsdale	Bedrock (lithic)	20- 40	---	Strongly cemented	---	---	High	High	Low.
MtA:									
Millsdale	Bedrock (lithic)	20- 40	---	Strongly cemented	---	---	High	High	Low.
MuA:									
Milton	Bedrock (lithic)	20- 40	---	Strongly cemented	---	---	Moderate	High	Moderate.
MuB:									
Milton	Bedrock (lithic)	20- 40	---	Strongly cemented	---	---	Moderate	High	Moderate.
MuB2:									
Milton	Bedrock (lithic)	20- 40	---	Strongly cemented	---	---	Moderate	High	Moderate.
MuC2:									
Milton	Bedrock (lithic)	20- 40	---	Strongly cemented	---	---	Moderate	High	Moderate.
MuD2:									
Milton	Bedrock (lithic)	20- 40	---	Strongly cemented	---	---	Moderate	High	Moderate.
MuE2:									
Milton	Bedrock (lithic)	20- 40	---	Strongly cemented	---	---	Moderate	High	Moderate.
MwA:									
Morningsun	---	> 80	---	---	---	---	High	High	Moderate.
MxA:									
Morningsun	---	> 80	---	---	---	---	High	High	Moderate.
Xenia	Dense material	40- 60	---	Noncemented	---	---	High	High	Moderate.
MxB:									
Morningsun	---	> 80	---	---	---	---	High	High	Moderate.
Xenia	Dense material	40- 60	---	Noncemented	---	---	High	High	Moderate.
MxB2:									
Morningsun	---	> 80	---	---	---	---	High	High	Moderate.
Xenia	Dense material	40- 60	---	Noncemented	---	---	High	High	Moderate.
MyA:									
Mahalasville	---	> 80	---	---	---	---	High	High	Low.
OcA:									
Ockley	Strongly contrasting textural stratification	40- 72	---	Noncemented	---	---	Moderate	Moderate	Moderate.

Table 33.--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			
OcB:									
Ockley	Strongly contrasting textural stratification	40- 72	---	Noncemented	---	---	Moderate	Moderate	Moderate.
Pg:									
Pits, gravel	---	---	---	---	---	---	---	---	---
Pq:									
Pits, quarry	---	---	---	---	---	---	---	---	---
PtB:									
Plattville	Bedrock (lithic)	40- 60	---	Strongly cemented	---	---	Moderate	High	Moderate.
RaA:									
Rainsville	---	> 80	---	---	---	---	Moderate	Moderate	Moderate.
RaB:									
Rainsville	---	> 80	---	---	---	---	Moderate	Moderate	Moderate.
RaB2:									
Rainsville	---	> 80	---	---	---	---	Moderate	Moderate	Moderate.
RcA:									
Randolph	Bedrock (lithic)	20- 40	---	Strongly cemented	---	---	High	High	Moderate.
RcB:									
Randolph	Bedrock (lithic)	20- 40	---	Strongly cemented	---	---	High	High	Moderate.
RnE2:									
Rodman	---	> 80	---	---	---	---	Low	Low	Low.
RnF2:									
Rodman	---	> 80	---	---	---	---	Low	Low	Low.
RoE2:									
Rodman	---	> 80	---	---	---	---	Low	Low	Low.
Kendallville	Dense material	28- 53	---	Noncemented	---	---	Moderate	Moderate	Moderate.
RoF2:									
Rodman	---	> 80	---	---	---	---	Low	Low	Low.
Kendallville	Dense material	28- 53	---	Noncemented	---	---	Moderate	Moderate	Moderate.
RpA:									
Rossburg	---	> 80	---	---	---	---	Moderate	Low	Low.
RuB:									
Russell	Dense material	40- 65	---	Noncemented	---	---	High	Moderate	Moderate.
Miamian	Dense material	20- 40	---	Noncemented	---	---	Moderate	Moderate	Moderate.
RuB2:									
Russell	Dense material	40- 63	---	Noncemented	---	---	High	Moderate	Moderate.
Miamian	Dense material	20- 40	---	Noncemented	---	---	Moderate	Moderate	Moderate.
SeA:									
Savona	Strongly contrasting textural stratification	30- 50	---	Noncemented	---	---	High	High	Low.
SnA:									
Sloan	---	> 80	---	---	---	---	High	High	Low.
StA:									
Stonelick	---	> 80	---	---	---	---	Moderate	Low	Low.
SvA:									
Sugarvalley	---	> 80	---	---	---	---	High	High	Moderate.

Table 33.--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			
SwA:									
Sugarvalley	---	> 80	---	---	---	---	High	High	Moderate.
Fincastle	Dense material	40- 60	---	Noncemented	---	---	High	High	Moderate.
ThA:									
Thackery	Strongly contrasting textural stratification	35- 70	---	Noncemented	---	---	High	Moderate	Moderate.
ThB:									
Thackery	Strongly contrasting textural stratification	35- 70	---	Noncemented	---	---	High	Moderate	Moderate.
Ud:									
Udorthents	---	---	---	---	---	---	---	---	---
W:									
Water	---	---	---	---	---	---	---	---	---
WbA:									
Warsaw	Strongly contrasting textural stratification	20- 40	---	Noncemented	---	---	Moderate	Low	Moderate.
WnA:									
Westland	Strongly contrasting textural stratification	40- 60	---	Noncemented	---	---	High	High	Low.
WyB:									
Wynn	Bedrock (paralithic)	20- 40	---	Moderately cemented	---	---	Moderate	High	Low.
WyB2:									
Wynn	Bedrock (paralithic)	20- 40	---	Moderately cemented	---	---	Moderate	High	Low.
WyC2:									
Wynn	Bedrock (paralithic)	20- 40	---	Moderately cemented	---	---	Moderate	High	Low.
WyD2:									
Wynn	Bedrock (paralithic)	20- 40	---	Moderately cemented	---	---	Moderate	High	Low.
XeA:									
Xenia	Dense material	40- 60	---	Noncemented	---	---	High	High	Moderate.
XeB:									
Xenia	Dense material	40- 60	---	Noncemented	---	---	High	High	Moderate.
XeB2:									
Xenia	Dense material	40- 60	---	Noncemented	---	---	High	High	Moderate.
XfB:									
Xenia	Dense material Bedrock (paralithic)	40- 60 55- 65	---	Noncemented Moderately cemented	---	---	High	High	Moderate.

TABLE 34.--CLASSIFICATION OF THE SOILS

(An asterisk in the first column indicates a taxadjunct to the series. Two asterisks in the first column indicates that one of the mapunits is a taxadjunct to the series. See text on page 219 for a description of those characteristics that are outside the range of the series.)

Soil name	Family or higher taxonomic class
*Celina	Fine, mixed, active, mesic Aquic Hapludalfs
Corwin	Fine-loamy, mixed, active, mesic Oxyaquic Argiudolls
Crosby	Fine, mixed, active, mesic Aeric Epiaqualfs
Cyclone	Fine-silty, mixed, superactive, mesic Typic Argiaquolls
Dana	Fine-silty, mixed, superactive, mesic Oxyaquic Argiudolls
Eel	Fine-loamy, mixed, superactive, mesic Fluvaquentic Eutrudepts
Eldean	Fine, mixed, superactive, mesic Typic Hapludalfs
Fincastle	Fine-silty, mixed, superactive, mesic Aeric Epiaqualfs
**Fox	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Typic Hapludalfs
*Hennepin	Fine-loamy, mixed, active, mesic Typic Eutrudepts
Kendallville	Fine-loamy, mixed, superactive, mesic Typic Hapludalfs
Kokomo	Fine, mixed, superactive, mesic Typic Argiaquolls
Lewisburg	Clayey, mixed, active, mesic, shallow Aquic Hapludalfs
Lippincott	Fine, mixed, superactive, mesic Typic Argiaquolls
Losantville	Clayey, mixed, active, mesic, shallow Oxyaquic Hapludalfs
Mahalasville	Fine-silty, mixed, superactive, mesic Typic Argiaquolls
*Medway	Fine-loamy, mixed, superactive, mesic Fluvaquentic Hapludolls
Miami	Fine-loamy, mixed, active, mesic Oxyaquic Hapludalfs
Miamian	Fine, mixed, active, mesic Oxyaquic Hapludalfs
Milford	Fine, mixed, superactive, mesic Typic Endoaquolls
Millsdale	Fine, mixed, active, mesic Typic Argiaquolls
Milton	Fine, mixed, active, mesic Typic Hapludalfs
Morningsun	Fine-silty, mixed, superactive, mesic Oxyaquic Hapludalfs
Ockley	Fine-loamy, mixed, active, mesic Typic Hapludalfs
*Plattville	Fine-loamy, mixed, active, mesic Typic Argiudolls
Rainsville	Fine-loamy, mixed, active, mesic Oxyaquic Hapludalfs
Randolph	Fine, mixed, active, mesic Aeric Endoaqualfs
Rodman	Sandy-skeletal, mixed, mesic Typic Hapludolls
Rossburg	Fine-loamy, mixed, superactive, mesic Fluventic Hapludolls
Russell	Fine-silty, mixed, superactive, mesic Typic Hapludalfs
Savona	Fine, mixed, superactive, mesic Aeric Endoaqualfs
Sloan	Fine-loamy, mixed, superactive, mesic Fluvaquentic Endoaquolls
Stonelick	Coarse-loamy, mixed, superactive, calcareous, mesic Typic Udifluvents
Sugarvalley	Fine-silty, mixed, superactive, mesic Aquic Hapludalfs
**Thackery	Fine-loamy, mixed, active, mesic Aquic Hapludalfs
Udorthents	Typic Udorthents
Warsaw	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Typic Argiudolls
Westland	Fine-loamy, mixed, superactive, mesic Typic Argiaquolls
Wynn	Fine, mixed, superactive, mesic Typic Hapludalfs
Xenia	Fine-silty, mixed, superactive, mesic Aquic Hapludalfs

TABLE 35.--INTERPRETIVE GROUPS

(Unless otherwise indicated, a complex is treated as a single management unit in the 'Land capability' column. See text for definitions of the groups. Absence of an entry indicates that the map unit is not suited to the intended use or is not rated.)

Map symbol and soil name	Land capability classification (p.196)	Pasture and hayland suitability group (p.198)	Prime farmland (p.184)	Hydric (p.186)
CeA:	1		All areas are prime farmland	
Celina		A-6		No
CeB:	2e		All areas are prime farmland	
Celina		A-6		No
CeB2:	2e		All areas are prime farmland	
Celina		A-6		No
CoA:	1		All areas are prime farmland	
Corwin		A-1		No
CtA:	2w		Prime farmland if drained	
Crosby		C-1		No
Celina		A-6		No
CtB:	2e		Prime farmland if drained	
Crosby		C-1		No
Celina		A-6		No
CvA:	2w		Prime farmland if drained	
Crosby		C-1		No
Lewisburg		A-6		No
CyA:	2w		Prime farmland if drained	
Cyclone		C-1		Yes
DaA:	1		All areas are prime farmland	
Dana		A-6		No
DaB:	2e		All areas are prime farmland	
Dana		A-6		No
EeA:	2w		All areas are prime farmland	
Eel		A-5		No
EgA:	2s		All areas are prime farmland	
Eldean		B-1		No
EgB:	2e		All areas are prime farmland	
Eldean		B-1		No
EgB2:	2e		All areas are prime farmland	
Eldean		B-1		No

Table 35.--Interpretive Groups--Continued

Map symbol and soil name	Land capability classification	Pasture and hayland suitability group	Prime farmland	Hydric
EhC3:	4e		Not prime farmland	
Eldean		B-1		No
EhD3:	6e		Not prime farmland	
Eldean		B-1		No
EkA:	2s		All areas are prime farmland	
Eldean		B-1		No
EkB:	2e		All areas are prime farmland	
Eldean		B-1		No
EkB2:	2e		All areas are prime farmland	
Eldean		B-1		No
FcA:	2w		Prime farmland if drained	
Fincastle		C-1		No
FdA:	2w		Prime farmland if drained	
Fincastle		C-1		No
FmA:	2s		All areas are prime farmland	
Fox		A-1		No
FmB:	2e		All areas are prime farmland	
Fox		A-1		No
FmB2:	2e		All areas are prime farmland	
Fox		A-1		No
HeF2:	7e		Not prime farmland	
Hennepin		A-3		No
Miamian		A-3		No
HwE2:	6e		Not prime farmland	
Hennepin		A-2		No
Wynn		F-1		No
HwF2:	7e		Not prime farmland	
Hennepin		A-3		No
Wynn		F-2		No
KeC2:	3e		Not prime farmland	
Kendallville		A-1		No
Eldean		B-1		No
KeD2:	4e		Not prime farmland	
Kendallville		A-1		No
Eldean		B-1		No

Table 35.--Interpretive Groups--Continued

Map symbol and soil name	Land capability classification	Pasture and hayland suitability group	Prime farmland	Hydric
KnA:	2w		Prime farmland if drained	
Kokomo		C-1		Yes
KoA:	2w		Prime farmland if drained	
Kokomo		C-1		Yes
LeB:	2e		All areas are prime farmland	
Lewisburg		A-6		No
Celina		A-6		No
LfB2:	2e		All areas are prime farmland	
Lewisburg		A-6		No
Celina		A-6		No
LgC3:	4e		Not prime farmland	
Lewisburg		A-6		No
LpA:	2w		Prime farmland if drained	
Lippincott		C-1		Yes
MaA:	2w		All areas are prime farmland	
Medway		A-5		No
MbB2:	2e		All areas are prime farmland	
Miami		B-1		No
McE2:	6e		Not prime farmland	
Miami		B-1		No
Kendallville		A-2		No
McF2:	7e		Not prime farmland	
Miami		B-2		No
Kendallville		A-3		No
MdC2:	3e		Not prime farmland	
Miami		B-1		No
MdD2:	4e		Not prime farmland	
Miami		B-1		No
MeC:	3e		Not prime farmland	
Miamian		A-1		No
MeC2:	3e		Not prime farmland	
Miamian		A-1		No
MeD2:	4e		Not prime farmland	
Miamian		A-1		No
MfB:	2e		All areas are prime farmland	
Miamian		A-1		No
Celina		A-6		No

Table 35.--Interpretive Groups--Continued

Map symbol and soil name	Land capability classification	Pasture and hayland suitability group	Prime farmland	Hydric
MfB2:	2e		All areas are prime farmland	
Miamian		A-1		No
Celina		A-6		No
MgE2:	6e		Not prime farmland	
Miamian		A-2		No
Kendallville		A-2		No
MgF2:	7e		Not prime farmland	
Miamian		A-3		No
Kendallville		A-3		No
MhC3:	4e		Not prime farmland	
Miamian		A-1		No
Losantville		B-1		No
MhD3:	6e		Not prime farmland	
Miamian		A-1		No
Losantville		B-1		No
MmE2:	6e		Not prime farmland	
Miamian		A-2		No
Hennepin		A-2		No
MnE3:	7e		Not prime farmland	
Miamian		A-2		No
Hennepin		A-2		No
MpA:	2w		Prime farmland if drained	
Milford		C-1		Yes
MrA:	2w		Prime farmland if drained	
Milford		C-1		Yes
MsA:	4w		Prime farmland if drained	
Millsdale		C-2		Yes
MtA:	4w		Prime farmland if drained	
Millsdale		C-2		Yes
MuA:	2s		All areas are prime farmland	
Milton		F-1		No
MuB:	2e		All areas are prime farmland	
Milton		F-1		No
MuB2:	2e		All areas are prime farmland	
Milton		F-1		No

Table 35.--Interpretive Groups--Continued

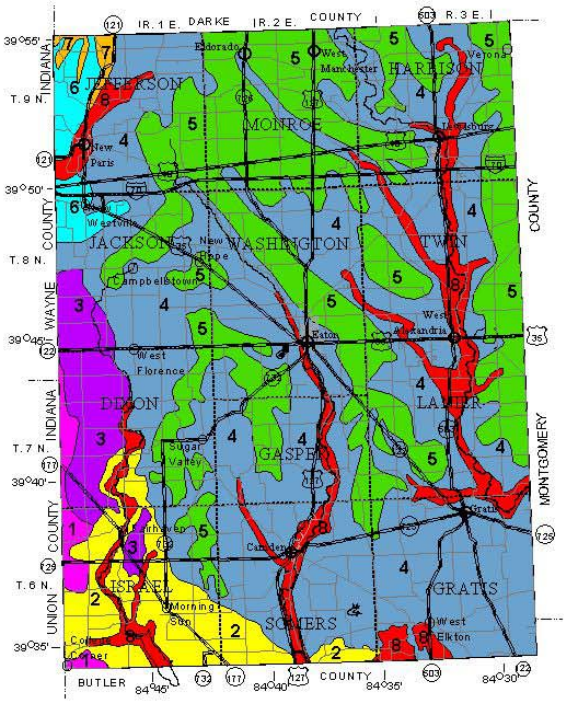
Map symbol and soil name	Land capability classification	Pasture and hayland suitability group	Prime farmland	Hydric
MuC2:	3e		Not prime farmland	
Milton		F-1		No
MuD2:	4e		Not prime farmland	
Milton		F-1		No
MuE2:	6e		Not prime farmland	
Milton		F-1		No
MwA:	1		All areas are prime farmland	
Morningsun		A-6		No
MxA:	1		All areas are prime farmland	
Morningsun		A-6		No
Xenia		A-6		No
MxB:	2e		All areas are prime farmland	
Morningsun		A-6		No
Xenia		A-6		No
MxB2:	2e		All areas are prime farmland	
Morningsun		A-6		No
Xenia		A-6		No
MyA:	2w		Prime farmland if drained	
Mahalasville		C-1		Yes
OcA:	1		All areas are prime farmland	
Ockley		B-1		No
OcB:	2e		All areas are prime farmland	
Ockley		B-1		No
Pg:	---		Not prime farmland	
Pits, Gravel		Not rated		Unranked
Pq:	---		Not prime farmland	
Pits, Quarry		Not rated		Unranked
PtB:	2e		All areas are prime farmland	
Plattville		A-1		No
RaA:	1		All areas are prime farmland	
Rainsville		A-1		No
RaB:	2e		All areas are prime farmland	
Rainsville		A-1		No
RaB2:	2e		All areas are prime farmland	
Rainsville		A-1		No

Table 35.--Interpretive Groups--Continued

Map symbol and soil name	Land capability classification	Pasture and hayland suitability group	Prime farmland	Hydric
RcA:	3w		Prime farmland if drained	
Randolph		C-2		No
RcB:	3e		Prime farmland if drained	
Randolph		C-2		No
RnE2:	7s		Not prime farmland	
Rodman		B-1		No
RnF2:	7s		Not prime farmland	
Rodman		B-2		No
RoE2:	7s		Not prime farmland	
Rodman		B-1		No
Kendallville		A-2		No
RoF2:	7s		Not prime farmland	
Rodman		B-2		No
Kendallville		A-3		No
RpA:	2w		All areas are prime farmland	
Rossburg		A-5		No
RuB:	2e		All areas are prime farmland	
Russell		A-6		No
Miamian		A-1		No
RuB2:	2e		All areas are prime farmland	
Russell		A-6		No
Miamian		A-1		No
SeA:	2w		Prime farmland if drained	
Savona		C-1		No
SnA:	3w		Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season	
Sloan		C-3		Yes
StA:	3w		Prime farmland if protected from flooding or not frequently flooded during the growing season	
Stonelick		A-5		No
SvA:	2w		Prime farmland if drained	
Sugarvalley		C-1		No

Table 35.--Interpretive Groups--Continued

Map symbol and soil name	Land capability classification	Pasture and hayland suitability group	Prime farmland	Hydric
SwA:	2w		Prime farmland if drained	
Sugarvalley		C-1		No
Fincastle		C-1		No
ThA:	1		All areas are prime farmland	
Thackery		A-6		No
ThB:	2e		All areas are prime farmland	
Thackery		A-6		No
Ud:	---		Not prime farmland	
Udorthents		Not rated		Unranked
W:	---		Not prime farmland	
Water		Not rated		Unranked
WbA:	2s		All areas are prime farmland	
Warsaw		A-1		No
WnA:	2w		Prime farmland if drained	
Westland		C-1		Yes
WyB:	2e		All areas are prime farmland	
Wynn		F-1		No
WyB2:	2e		All areas are prime farmland	
Wynn		F-1		No
WyC2:	3e		Not prime farmland	
Wynn		F-1		No
WyD2:	4e		Not prime farmland	
Wynn		F-1		No
XeA:	1		All areas are prime farmland	
Xenia		A-6		No
XeB:	2e		All areas are prime farmland	
Xenia		A-6		No
XeB2:	2e		All areas are prime farmland	
Xenia		A-6		No
XfB:	2e		All areas are prime farmland	
Xenia		A-6		No



GENERAL SOIL MAP
PREBLE COUNTY, OHIO

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
IN COOPERATION WITH
OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF SOIL AND WATER CONSERVATION
OHIO AGRICULTURAL RESEARCH AND DEVELOPMENT CENTER
OHIO STATE UNIVERSITY EXTENSION
PREBLE SOIL AND WATER CONSERVATION DISTRICT
PREBLE COUNTY COMMISSIONERS

1:253440

5 0 5 10 Miles

Road Legend

- State and Federal Roads
- County and Local Roads
- State Routes
- Interstate
- Federal Routes

Political Legend

- County Boundary
- Township Boundary
- Main Bodies of Water
- Cities and Towns

Soil Legend

1. Fincastle-Cyclone-Xenia
2. Xenia-Miamian-Fincastle
3. Cyclone-Sugarvalley-Morningsun
4. Celina-Miamian-Kokomo
5. Kokomo-Crosby-Celina
6. Miami-Kendallville
7. Eldean-Lippincott
8. Eldean-Stonelick-Rossburg

N
W E
S