United States Department of Agriculture

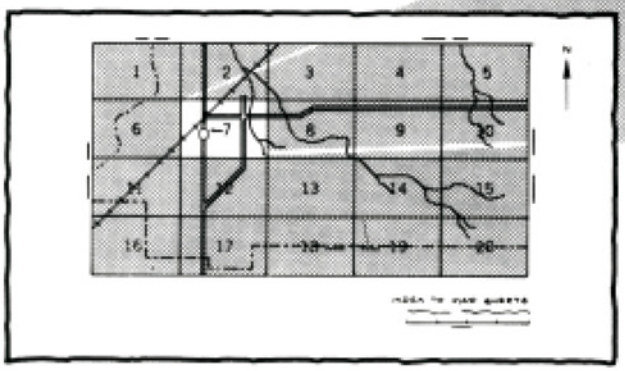
Soil Conservation Service

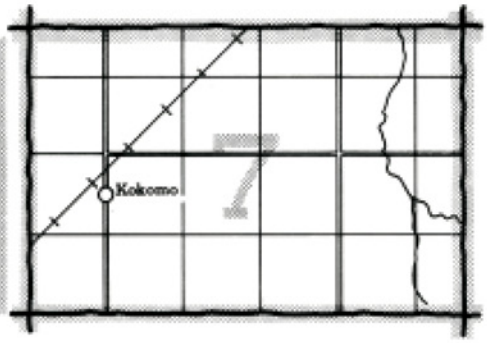
In cooperation with Purdue University Agricultural Experiment Station and Indiana Department of Natural Resources, Soil and Water Conservation Committee

Soil Survey of Gibson County, Indiana

HOW TO USE

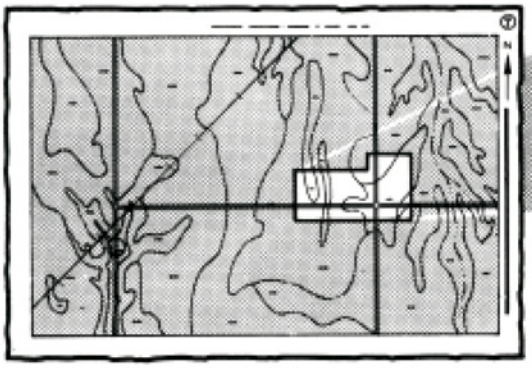
1. Locate your area of interest on the "Index to Map Sheets"

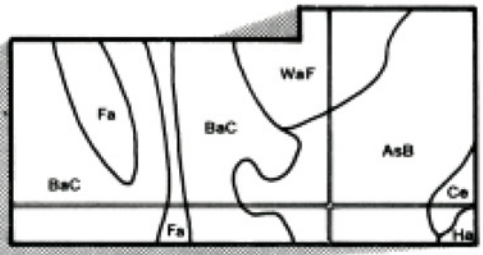




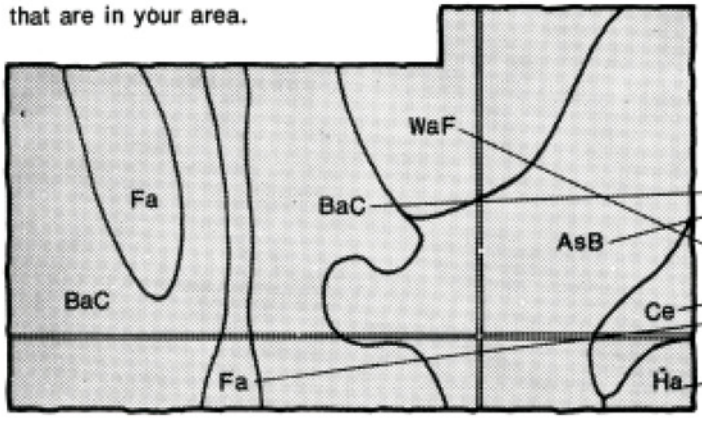
2. Note the number of the map sheet and turn to that sheet.

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





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

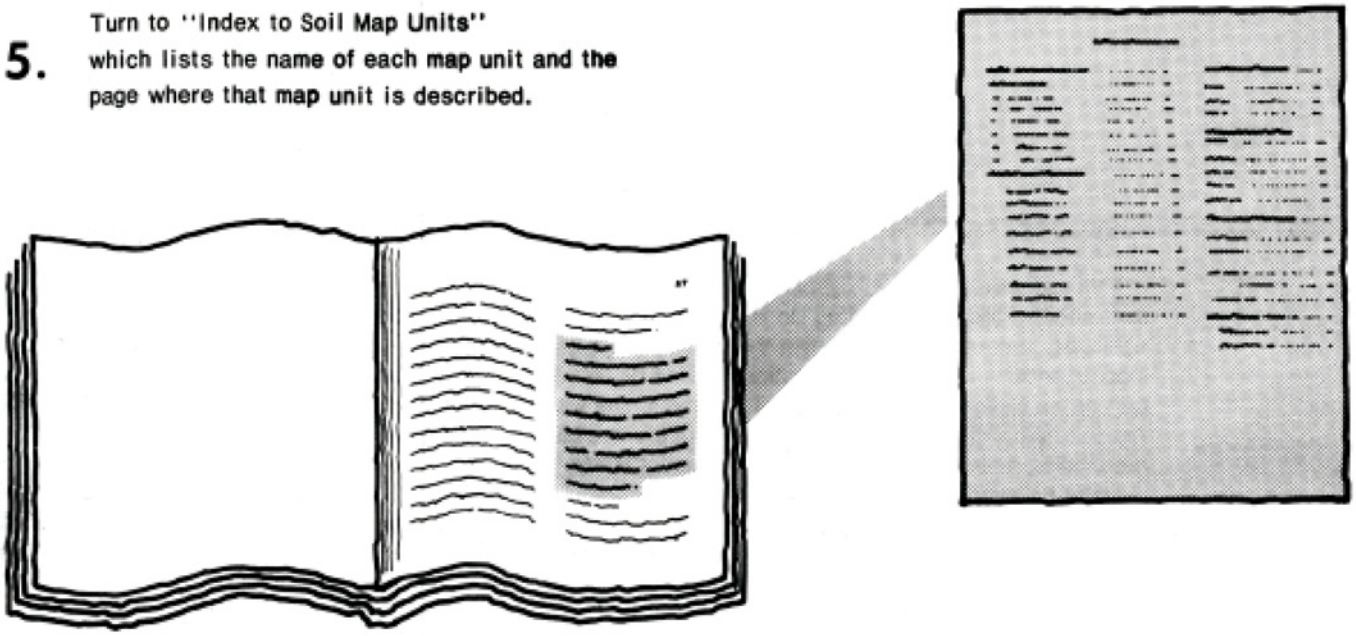


Symbols

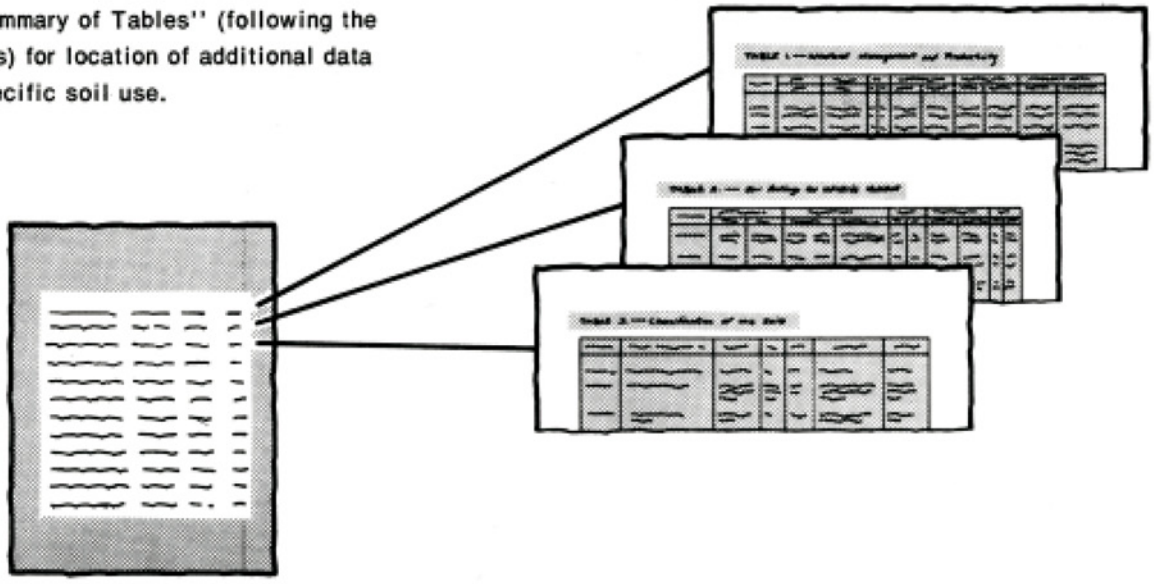
- AsB
- BaC
- Ce
- Fa
- Ha
- WaF

THIS SOIL SURVEY

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



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



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

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies including the Agricultural Experiment Stations, and local agencies. The Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all, regardless of race, color, national origin, sex, religion, marital status, handicap, or age.

Major fieldwork for this soil survey was completed in 1984. Soil names and descriptions were approved in 1986. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1985. This survey was made cooperatively by the Soil Conservation Service, the Purdue University Agricultural Experiment Station, and the Indiana Department of Natural Resources, Soil and Water Conservation Committee. It is part of the technical assistance furnished to the Gibson County Soil and Water Conservation District. Financial assistance was made available by the Gibson County Commissioners.

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

Cover: No-till soybeans planted in wheat stubble on Reesville and Uniontown soils.

Contents

Soil Series

Issued June 1989

Index to Map Units

Summary of Tables

Foreword

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

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

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

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

Robert L. Eddleman
State Conservationist
Soil Conservation Service

Location of Gibson County in Indiana.

Soil Survey of Gibson County, Indiana

By Kendall M. McWilliams, Soil Conservation Service

Fieldwork by Kendall M. McWilliams and Gary R. Struben, Soil Conservation Service, and Robert C. Jones and Curtis R. Crafton, Indiana Department of Natural Resources, Soil and Water Conservation Committee

United States Department of Agriculture, Soil Conservation Service, in cooperation with Purdue University Agricultural Experiment Station and Indiana Department of Natural Resources, Soil and Water Conservation Committee

GIBSON COUNTY is in the southwestern part of Indiana. It is bounded on the west by the Wabash River, which separates it from Illinois; on the north by the White River, which separates it from Knox County; on the east by Pike County; and on the south by Posey, Vanderburgh, and Warrick Counties. The county is roughly triangular in shape, measuring about 36 miles east and west and about 24 miles north and south. It has an area of 319,456 acres, or about 499 square miles (*12*). It has a population of 33,156. Princeton, the county seat and the largest town, has a population of about 9,000. About 16 percent of the work force is employed in agriculture or related services (*6*).

About 73 percent of the county is farmland. About 5 percent of the farmland is woodland. Cash-grain production is the main agricultural enterprise.

This soil survey updates the survey of Gibson County published in 1926 (*4*). It provides additional information and larger maps, which show the soils in greater detail.

General Nature of the County

This section gives general information concerning Gibson County. It describes climate, history, transportation facilities, relief, natural resources, and trends in population and land use.

Climate

Prepared by the National Climatic Center, Asheville, North Carolina.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Princeton, Indiana, in the period 1951 to 1978. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter the average temperature is 34 degrees F, and the average daily minimum temperature is 25 degrees. The lowest temperature on record, which occurred at Princeton on January 11, 1977, is -18 degrees. In summer the average temperature is 76 degrees, and the average daily maximum temperature is 87 degrees. The highest recorded temperature, which occurred on September 2, 1953, is 104 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (40 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is 43.6 inches. Of this, nearly 24 inches, or about 55 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the

rainfall in April through September is less than 20 inches. Thunderstorms occur on about 45 days each year.

The average seasonal snowfall is about 9 inches. The greatest snow depth at any one time during the period of record was 10 inches. On the average, 3 days of the year have at least 1 inch of snow on the ground.

The average relative humidity in midafternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 85 percent. The sun shines 75 percent of the time possible in summer and 45 percent in winter. The prevailing wind is from the southwest. Average windspeed is highest, 11 miles per hour, in spring.

History

Gibson County was originally a part of the Northwest Territory (*7*). In the late 1700's, it was inhabited by remnants of the Shawnee, Sac, Fox, Kickapoo, Miami, and Pottawatomi Indian Tribes. John Severns, the first permanent settler, arrived in 1789. He settled in an area along the Patoka River, where he operated a ferry carrying Indians and settlers across the river. Severns Bridge, north of Princeton, is named after this man.

In 1813, the Territorial Assembly of Indiana met in Vincennes (*5*). A large area of southwestern Indiana then known as Knox County was divided into several smaller counties. The area south of the White River was named Gibson County, after General John Gibson, the Territorial Secretary and a veteran of the French and Indian and Revolutionary Wars. The county originally included the areas that now make up Posey, Vanderburgh, Pike, and Warrick Counties. Prince Town, later changed to Princeton, was named the county seat in 1914 (*8*).

Most of the early settlers came up from the Ohio River along the Red Banks Trace, which extended from Henderson, Kentucky, to Vincennes, Indiana. This trail was originally formed by buffalo, then used by Indians, and later used by French hunters and traders.

The population of the area grew rapidly. The local economy was based mainly on agricultural products, although some light manufacturing was established.

In 1853, the Wabash Erie Canal was completed. This canal linked Lake Erie with Evansville, Indiana. In Gibson County, an aquaduct carried the canal across the Patoka River. At Port Gibson, a 2,000-acre lake was constructed as a water reserve. The canal was abandoned in 1863 (*9*). Remnants of the canal are still evident in the county.

The first railroad was constructed in the county in 1870, after which development of the county followed at a rapid pace (*8*). Agricultural products, oil, gas, and coal became important industrial commodities.

Transportation Facilities

Interstate Highway 64 is near the southern boundary of Gibson County. About 3 miles of this highway is in the county. The county also has approximately 12 miles of other federal highways, 60 miles of state highways, and hundreds of miles of county roads. Most of the county roads are graveled. A few are paved.

Three main railroad lines cross the county. There are no large airports in the county.

Relief

The highest point in Gibson County, in an area about 2 miles north of Princeton, is about 645 feet above sea level. The lowest is about 355 feet. The average elevation is about 470 feet.

Natural Resources

Soil is the most valuable natural resource in the county. It provides a growing medium for crops and for the grasses grazed by livestock. Agricultural products generate more income in the county than any other natural resource. Other natural resources include coal, oil, sand, and timber.

The county is underlain by large coal beds and a large oil field. The estimated reserve of coal is about 2.3 billion tons (*3*). Both shaft mining and strip mining are used to exploit this resource. Oil wells are operated throughout the county. Both oil and coal are marketed outside the county.

In the western part of the county, deposits of sand are extensive enough to be a valuable resource. On river terraces, the depth to sand ranges from 15 to 80 feet. These deposits are as much as 150 feet thick.

Timber production is a small but important industry in the county. About 19,000 acres in the county is used as woodland. Most of the commercial timber is sold to markets outside the county.

Trends in Population and Land Use

In 1980, Gibson County had a population of 33,156 and a population density of about 66 people per square mile. The population increased by about 9 percent between 1970 and 1980. This rate of growth is expected to continue through 1990 (*12*).

Nearly all of the acreage in the county is used for agricultural production or for woodland. Urban and built-up land makes up about 2 percent of the county (*13*). The recent trend has been toward a moderate rate of conversion of farmland to urban uses. This trend is expected to continue in the future.

How This Survey Was Made

This survey was made to provide information about the soils in the survey area. The information includes a description of the soils and their location and a discussion of the suitability, limitations, and management of the soils for specified uses. Soil scientists observed the steepness, length, and shape of slopes; the general

pattern of drainage; the kinds of crops and native plants growing on the soils; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biologic activity.

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

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

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

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

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

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

Map Unit Composition

A map unit delineation on a soil map represents an area dominated by one major kind of soil or an area dominated by several kinds of soil. A map unit is identified and named according to the taxonomic classification of the dominant soil or soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural objects. In common with other natural objects, they have a characteristic variability in their properties. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of soils of other taxonomic classes. Consequently, every map unit is made up of the soil or soils for which it is named and some soils that belong to other taxonomic classes. These latter soils are called inclusions or included soils.

Most inclusions have properties and behavioral patterns similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting (similar) inclusions. They may or may not be mentioned in the map unit descriptions. Other inclusions, however, have properties and behavior divergent enough to affect use or require different management. These are contrasting (dissimilar) inclusions. They generally occupy small areas and cannot be shown separately on the soil maps because of the scale used in mapping. The inclusions of

contrasting soils are mentioned in the map unit descriptions. A few inclusions may not have been observed and consequently are not mentioned in the descriptions, especially where the soil pattern was so complex that it was impractical to make enough observations to identify all of the kinds of soil on the landscape.

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

General Soil Map Units

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

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

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

The names, descriptions, and delineations of the soils identified on the general soil map of this county do not always agree or join fully with those of the soils identified on the maps of adjoining counties published at an earlier date. Some differences are the result of changes in concepts of soil series. Other differences result from variations in the extent of the soils. Others are the result of variations in the slope range allowed in the associations.

Soil Descriptions

Deep, Nearly Level to Very Steep, Somewhat Excessively Drained to Moderately Well Drained Soils; on Uplands

These soils make up about 51 percent of the county. They are at the higher elevations in the county. The main management problem is erosion.

1. Alford-Sylvan Association

Deep, nearly level to very steep, well drained, medium textured soils formed in loess; on uplands

This association is on ridgetops and side slopes in the uplands. It is dissected by small streams and drainageways. Slopes range from 0 to 50 percent.

This association makes up about 25 percent of the county. It is about 56 percent Alford soils, 13 percent Sylvan soils, and 31 percent minor soils (fig. 1).

Alford soils are nearly level and gently sloping on ridgetops and moderately sloping to very steep on side slopes. Typically, the surface layer is brown silt loam. The subsoil is yellowish brown silt loam. The underlying material is yellowish brown silt.

Sylvan soils are gently sloping on ridgetops and moderately sloping to very steep on side slopes. Typically, the surface layer is dark grayish brown silt loam. The subsoil is strong brown silt loam. The underlying material is light brownish gray silt loam.

The minor soils in this association are the well drained Gilpin Variant, Parke, and Taftown soils on the steeper side slopes; the well drained and moderately well drained Uniontown soils on toe slopes; the moderately well drained Muren soils on the broader ridgetops; and the moderately well drained Wilbur, somewhat poorly drained Wakeland, and poorly drained Birds soils along small drainageways.

This association is used mainly as cropland. The steeper areas are used for hay and pasture or for woodland. The less sloping major soils are generally suitable as cropland, but the slope and the hazard of erosion are problems. The association is well suited to woodland. The less sloping soils are suitable as sites for dwellings and other urban uses.

2. Bloomfield-Alvin Association

Deep, nearly level to very steep, somewhat excessively drained and well drained, coarse textured and moderately coarse textured soils formed in sandy eolian material; on uplands

This association is on ridgetops, side slopes, and dunes in the uplands. It is dissected by short drainageways. Slopes range from 0 to 50 percent.

This association makes up about 6 percent of the county. It is about 62 percent Bloomfield soils, 27 percent Alvin soils, and 11 percent minor soils (fig. 2).

Bloomfield soils are somewhat excessively drained. They are nearly level in depressions, gently sloping and moderately sloping on ridgetops, and gently sloping to very steep on side slopes. Typically, the surface layer is brown sand. The subsoil is strong brown and reddish brown sand.

Alvin soils are well drained. They are gently sloping on ridgetops and moderately sloping or strongly sloping on side slopes. Typically, the surface layer is brown fine

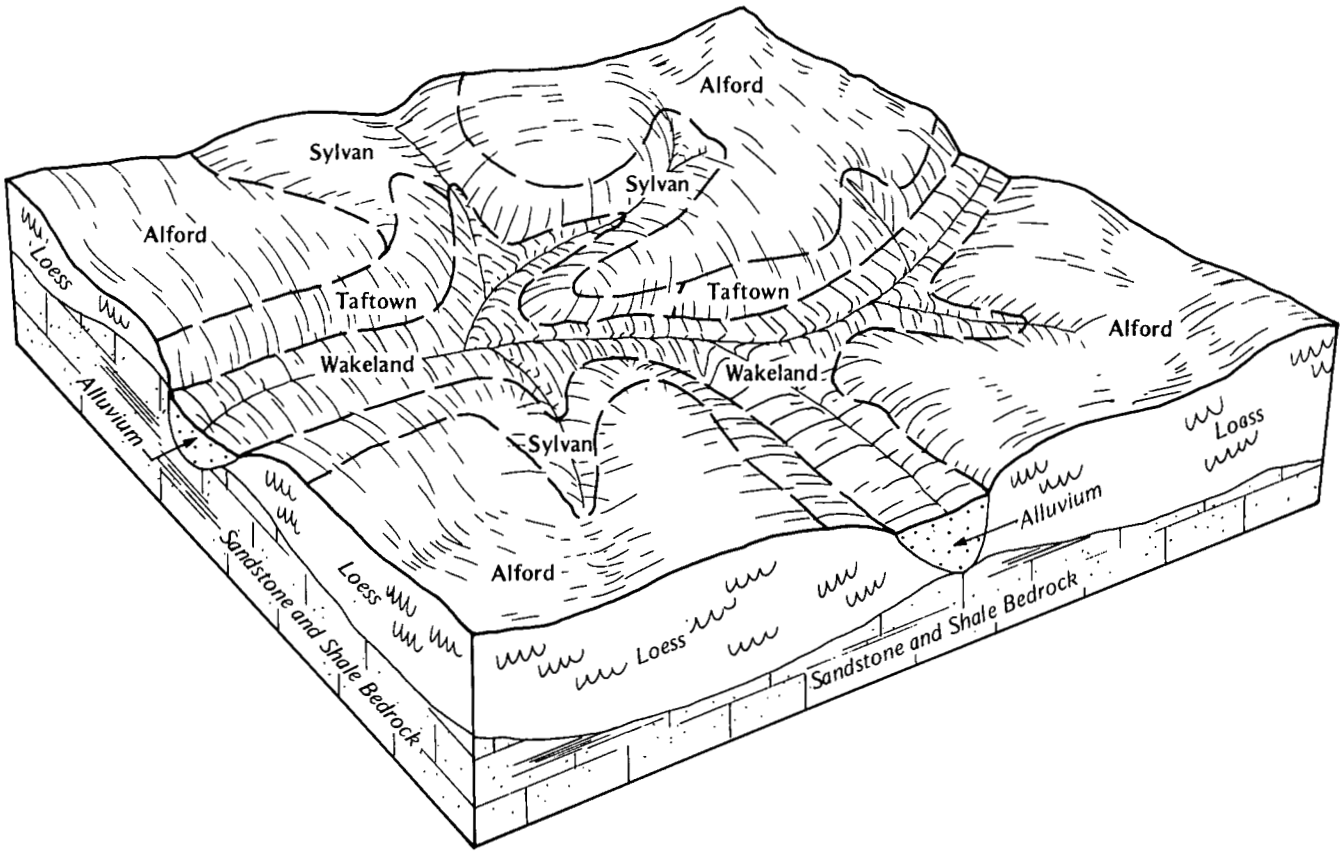


Figure 1.—Pattern of soils and parent material in the Alford-Sylvan association.

sandy loam. The subsoil is strong brown fine sandy loam and loamy fine sand. The underlying material is strong brown and brown fine sand.

The minor soils in this association are the somewhat poorly drained Ayrshire Variant and poorly drained Junius Variant soils in depressions and drainageways.

This association is used mainly as cropland. Melons are one of the major crops. The steeper areas are used for woodland or for hay and pasture. The major soils are generally suitable as cropland but slope, droughtiness, and erosion are problems. The soils are well suited to woodland. They are suitable as sites for dwellings and other urban uses, but the slope of both soils and rapid permeability in the Bloomfield soils are limitations.

3. Hosmer Association

Deep, gently sloping and moderately sloping, well drained and moderately well drained, medium textured soils formed in loess; on uplands

This association is on ridgetops and side slopes in the uplands. It is dissected by many small streams and drainageways. Slopes range from 2 to 12 percent.

This association makes up about 20 percent of the county. It is about 75 percent Hosmer soils and 25 percent minor soils (fig. 3).

Hosmer soils are gently sloping on ridgetops and moderately sloping on side slopes. Typically, the surface layer is brown silt loam. The upper part of the subsoil is yellowish brown silt loam. The lower part is a very firm fragipan. It is strong brown, mottled silty clay loam and dark yellowish brown, mottled silt loam.

The minor soils in this association are the well drained Gilpin Variant and Taftown and moderately well drained Gudgel soils on the steeper side slopes, the well drained Fairpoint and moderately well drained Swanwick Variant soils in areas of strip-mine spoil, and the somewhat poorly drained Stendal and Wakeland soils along streams and drainageways.

This association is used mainly as cropland. The steeper areas are used for hay and pasture or for woodland. The Hosmer soils are generally suitable as cropland, but the slope and the hazard of erosion are problems. The soils are well suited to woodland. They are suitable as sites for dwellings and other urban uses, but restricted permeability and wetness are limitations.

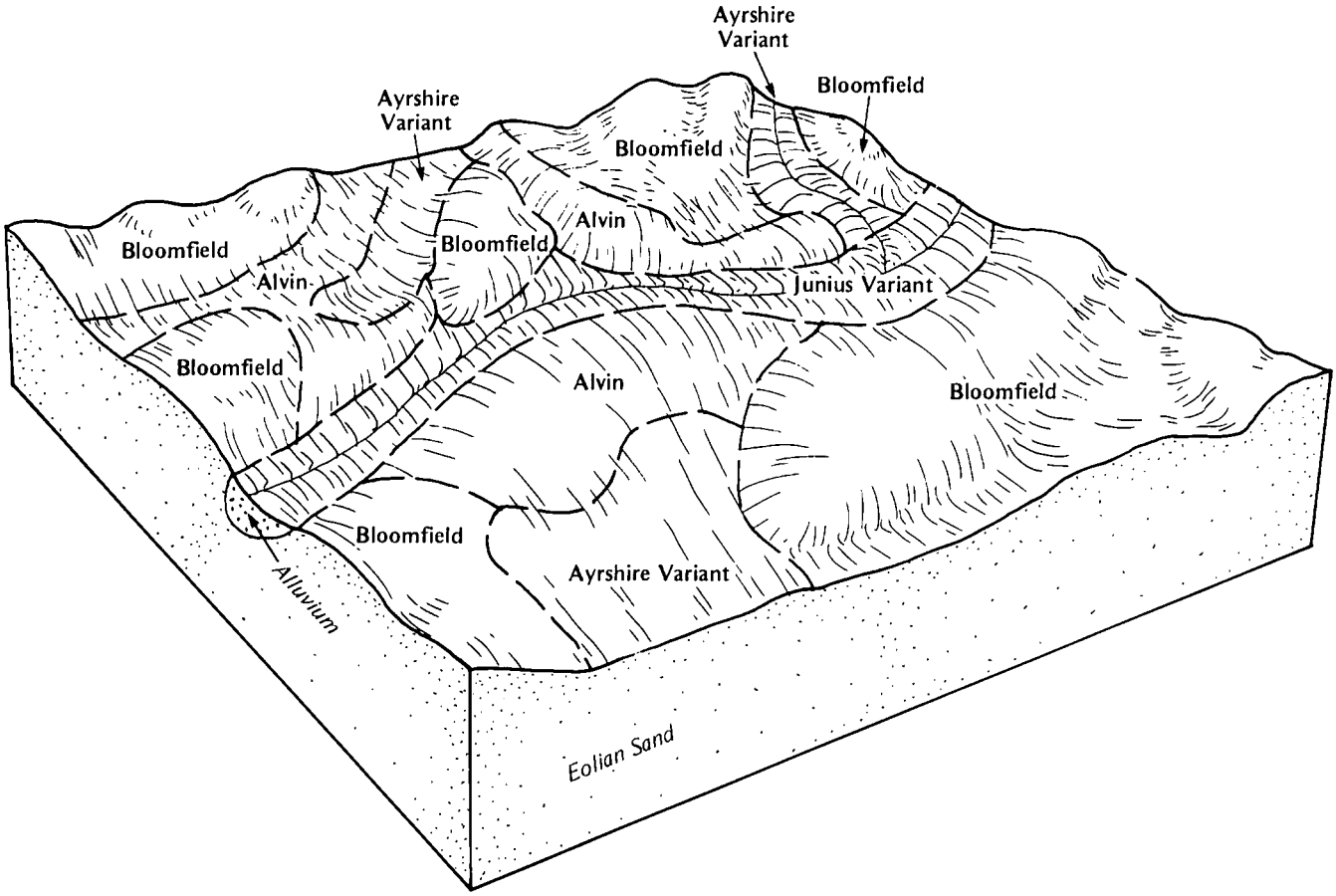


Figure 2.—Pattern of soils and parent material in the Bloomfield-Alvin association.

Deep, Nearly Level to Moderately Sloping, Very Poorly Drained to Well Drained Soils; on Lake Plains, Terraces, and Bottom Land

These soils make up about 32 percent of the county. They are in low lying areas. The main management problem is wetness.

4. Ragsdale-Uniontown-Reesville Association

Deep, nearly level to moderately sloping, very poorly drained, somewhat poorly drained, moderately well drained, and well drained, medium textured soils formed in silty lacustrine and lakebed sediments; on lake plains and lacustrine terraces

This association is on broad lake plains and the slightly higher lacustrine terraces. It is dissected by many drainage ditches and a few streams. Slopes range from 0 to 12 percent.

This association makes up about 14 percent of the county. It is about 37 percent Ragsdale soils, 32 percent Uniontown soils, 16 percent Reesville soils, and 15 percent minor soils.

The nearly level, very poorly drained Ragsdale soils are on lake plains. Typically, the surface layer is very dark gray silt loam. The subsoil is grayish brown, light brownish gray, and dark gray, mottled silt loam. The underlying material is light brownish gray, mottled silt loam.

The nearly level to moderately sloping, moderately well drained and well drained Uniontown soils are on lacustrine terraces. Typically, the surface layer is brown silt loam. The subsoil is yellowish brown silty clay loam and silt loam. The underlying material is yellowish brown, mottled silt loam.

The nearly level, somewhat poorly drained Reesville soils are on lake plains. Typically, the surface layer is brown silt loam. The subsoil is yellowish brown and grayish brown, mottled silt loam. The underlying material is light olive brown, mottled silt loam.

The minor soils in this association include the somewhat poorly drained Maplehill soils along streams and drainageways that extend into the uplands. Also of

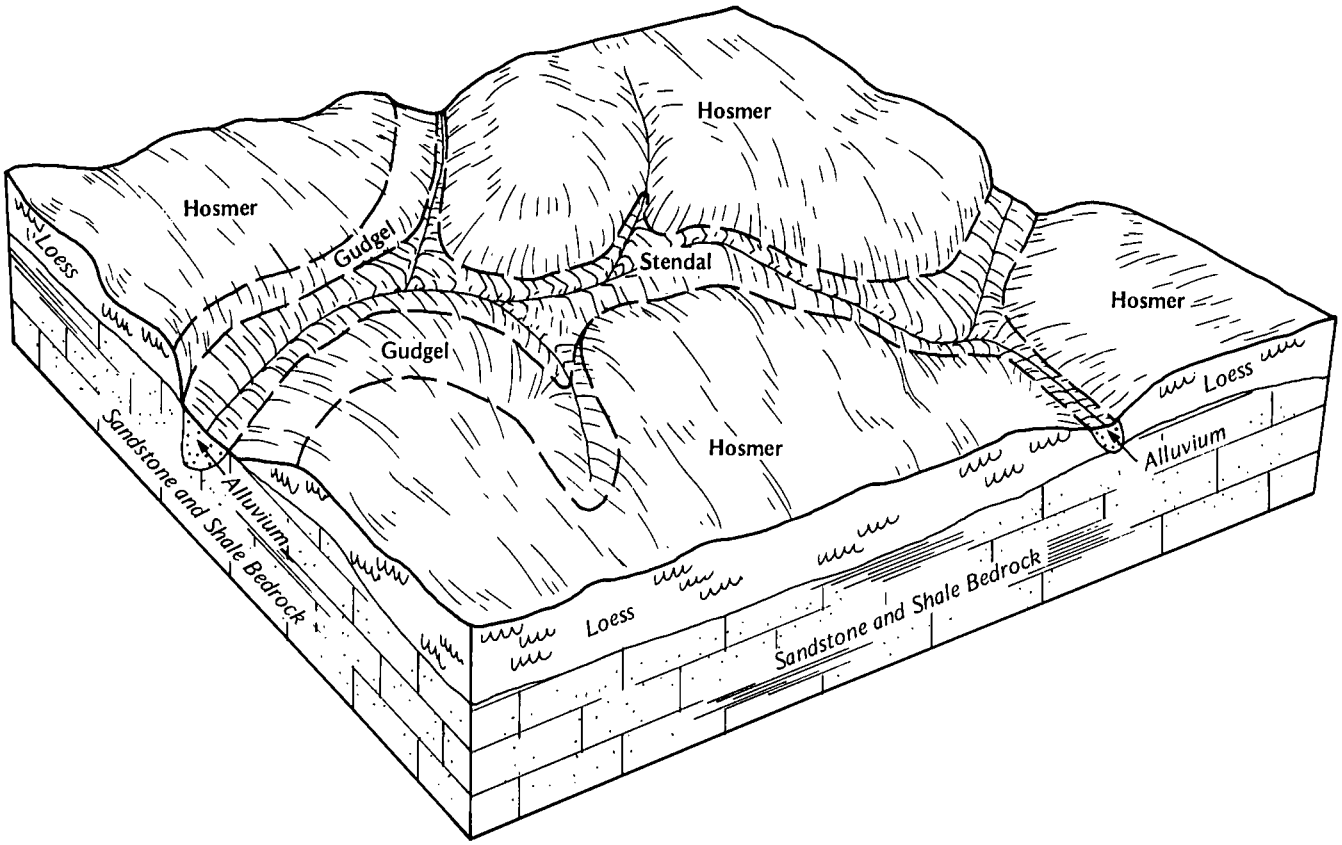


Figure 3.—Pattern of soils and parent material in the Hosmer association.

minor extent are the poorly drained Evansville soils on lake plains.

This association is used mainly as cropland. A few areas are used for hay and pasture or for woodland. If drained, the major soils are generally well suited to cultivated crops. The wetness is a limitation. The soils are well suited to woodland. They are poorly suited to dwellings and other urban uses because of the wetness.

5. Vincennes-Zipp Association

Deep, nearly level, poorly drained and very poorly drained, medium textured and fine textured soils formed in loamy sediments and lacustrine sediments; on river terraces and bottom land

This association is on broad plains on river terraces and bottom land. It is dissected by drainage ditches. Slopes range from 0 to 2 percent.

This association makes up about 12 percent of the county. It is about 59 percent Vincennes soils, 19 percent Zipp soils, and 22 percent minor soils.

The poorly drained Vincennes soils are on river terraces and bottom land. Typically, the surface layer is dark grayish brown loam or silt loam. The subsoil is light gray and light brownish gray, mottled clay loam. The underlying material is gray clay loam.

The very poorly drained Zipp soils are in depressions on river terraces. Typically, the surface layer is dark gray silty clay. The subsoil is gray, mottled clay. The underlying material is light gray, mottled clay.

The minor soils in this association are the well drained Armiesburg, Elkinsville, Landes, and Skelton and moderately well drained Medway soils in the higher areas and the somewhat poorly drained Crawleyville soils in the slightly higher areas.

This association is used mainly as cropland. Some undrained areas are wooded, and a few areas are used for hay and pasture. If drained, the major soils are well suited to cultivated crops (fig. 4). The wetness is a limitation. Also, flooding is a hazard in unprotected areas. The soils are well suited to woodland. They are poorly suited to dwellings and other urban uses, mainly because of the wetness. The flooding in unprotected areas also affects building site development.

Figure 4.—A shallow surface drain in a cultivated area of the Vincennes-Zipp association.

6. Peoga-Iva Association

Deep, nearly level and gently sloping, poorly drained and somewhat poorly drained, medium textured soils formed in silty material of mixed origin and in loess; on stream terraces

This association is on broad plains and on swells on stream terraces. It is dissected by small streams and drainageways. Slopes range from 0 to 4 percent.

This association makes up about 3 percent of the county. It is about 48 percent Peoga soils, 48 percent Iva soils, and 4 percent minor soils.

The nearly level, poorly drained Peoga soils are on plains. Typically, the surface layer is grayish brown silt loam. The subsoil and underlying material are light gray, mottled silt loam.

The nearly level and gently sloping, somewhat poorly drained Iva soils are on swells. Typically, the surface layer is brown silt loam. The subsoil is yellowish brown, mottled silt loam and silty clay loam. The underlying material is yellowish brown, mottled silt loam.

The minor soils in this association are the well drained Alford and well drained and moderately well drained Hosmer soils in the slightly higher areas.

This association is used mainly as cropland. A few areas are used for hay and pasture or for woodland. If drained, the major soils are generally well suited to cultivated crops. The wetness is a limitation. The soils are well suited to woodland. They are poorly suited to dwellings and other urban uses because of the wetness.

7. Lyles-Rensselaer Association

Deep, nearly level, very poorly drained, moderately coarse textured soils formed in loamy sediments; on river terraces

This association is on broad plains and in depressions on river terraces. It is dissected by drainage ditches and small drainageways. Slopes range from 0 to 2 percent.

This association makes up about 3 percent of the county. It is about 40 percent Lyles soils, 27 percent Rensselaer soils, and 33 percent minor soils.

Typically, the surface layer of the Lyles soils is very dark grayish brown fine sandy loam or very dark gray sandy loam. The subsoil is dark gray, mottled fine sandy loam. The underlying material is light gray, mottled loamy fine sand.

Typically, the surface layer of the Rensselaer soils is very dark gray fine sandy loam. The subsoil is dark gray and gray, mottled sandy clay loam and sandy loam. The underlying material is gray, mottled loam.

The minor soils in this association are the very poorly drained Adrian and Montgomery and poorly drained Patton soils on broad plains and in depressions.

This association is used mainly as cropland. A few areas are used for woodland or for hay and pasture. If drained, the major soils are generally well suited to cultivated crops. The wetness is a limitation. The soils are well suited to woodland. They are poorly suited to dwellings and other urban uses because of the wetness.

Deep, Nearly Level, Well Drained, Somewhat Poorly Drained, and Poorly Drained Soils; on Bottom Land

These soils make up about 17 percent of the county. They are in low lying areas along streams and rivers. The main management problem is flooding.

8. Nolin Association

Deep, nearly level, well drained, medium textured soils formed in alluvium; on bottom land

This association is on bottom land dissected by old river channels and small streams. Slopes range from 0 to 2 percent.

This association makes about 7 percent of the county. It is about 65 percent Nolin and similar soils and 35 percent minor soils.

Typically, the surface layer of the Nolin soils is dark grayish brown silt loam. The subsoil is yellowish brown and dark yellowish brown silt loam.

The minor soils in this association are the well drained Wirt and somewhat excessively drained Moundhaven soils close to the channels, the moderately well drained Lindside soils in slight depressions, and the somewhat poorly drained Newark and very poorly drained Wilhite soils in old channels and depressions.

This association is used mainly as cropland. Areas along the river and stream channels and in depressions are used as woodland. Only a few areas are used as pasture. The Nolin soils are well suited to cultivated crops, but flooding is a hazard. The soils are well suited to woodland. They are generally unsuitable as sites for dwellings and other urban uses because of the flooding.

9. Stendal-Bonnie-Birds Association

Deep, nearly level, somewhat poorly drained and poorly drained, medium textured soils formed in alluvium; on bottom land

This association is on bottom land dissected by old stream channels, small streams, and drainageways. Slopes range from 0 to 2 percent.

This association makes up about 7 percent of the county. It is about 39 percent Stendal soils, 28 percent Bonnie soils, 25 percent Birds soils, and 8 percent minor soils.

Stendal soils are somewhat poorly drained. Typically, the surface layer is brown silt loam. The subsoil is dark yellowish brown and light gray, mottled silt loam. The underlying material is light brownish gray, mottled silt loam.

Bonnie soils are poorly drained. Typically, the surface layer is grayish brown silt loam. The subsoil is gray, mottled silt loam. The underlying material is light brownish gray and grayish brown, mottled silt loam.

Birds soils are poorly drained. Typically, the surface layer is dark grayish brown silt loam. The subsoil is light brownish gray, light gray, and gray, mottled silt loam.

The minor soils in this association are the moderately well drained Steff and somewhat poorly drained Wakeland soils along stream channels.

This association is used mainly as cropland. Areas along stream channels and undrained areas are used as woodland. A few areas are used for hay and pasture. The major soils are generally suitable as cropland, but flooding, wetness, and ponding are problems. The soils are well suited to woodland. They are generally unsuitable as sites for dwellings and other urban uses because of the flooding, the wetness, and the ponding.

10. Petrolia Association

Deep, nearly level, poorly drained, medium textured and moderately fine textured soils formed in alluvium; on bottom land

This association is on broad bottom land dissected by old channels, drainage ditches, and streams. Slopes range from 0 to 2 percent.

This association makes up about 3 percent of the county. It is about 83 percent Petrolia soils and 17 percent minor soils.

Typically, the surface layer of the Petrolia soils is dark grayish brown silt loam or silty clay loam. The subsoil is gray and light gray, mottled silty clay loam. The underlying material is light brownish gray, mottled silty clay loam.

The minor soils in this association are the somewhat poorly drained Henshaw Variant soils in the slightly higher areas, the well drained and moderately well drained Uniontown soils on terrace breaks, and the

somewhat poorly drained Stendal and moderately well drained Steff soils along stream channels.

This association is used mainly as cropland. Areas along stream channels and undrained areas are used as woodland. A few areas are used for hay and pasture. The major soils are generally suitable as cropland, but flooding, wetness, and ponding are problems. The soils are well suited to woodland. They are generally unsuitable as sites for dwellings and other urban uses because of the flooding, the wetness, and the ponding.

Broad Land Use Considerations

Deciding what the long-term land uses should be is an important issue in the county. Most of the county currently is used for agricultural purposes, but there is a growing trend toward the conversion to other uses. The development of better transportation facilities has enabled people to live in a rural setting and commute to work. Each year some land is developed for urban uses near the larger towns and in scattered areas throughout the county. Some areas are surface mined for coal. These land uses remove agricultural land from production.

The general soil map is helpful in planning the general location of urban areas, but it cannot be used for the selection of sites for specific urban structures. Areas where the soils are so unfavorable that urban development is not desirable are extensive in the county. The Nolin, Petrolia, and Stendal-Bonnie-Birds associations are subject to flooding, usually during winter and early spring. Areas of the Vincennes-Zipp association that are not protected by levees also are subject to flooding. Levees are needed, but they are very costly if they are constructed to provide total protection.

A seasonal high water table restricts urban development in the Peoga-Iva, Ragsdale-Uniontown-Reesville, Lyles-Rensselaer, Petrolia, and Vincennes-Zipp associations. A drainage system that effectively lowers the water table is costly.

Some areas in the county can be developed at a lower cost than other areas. These include the less sloping areas of the Alford-Sylvan and Bloomfield-Alvin associations. The Hosmer association is generally suitable for urban development if public sewage systems are available.

Almost all of the associations have areas that are suitable for cultivated crops. Nearly all of the major soils in the Ragsdale-Uniontown-Reesville, Peoga-Iva, Petrolia, Stendal-Bonnie-Birds, and Vincennes-Zipp associations are wet during certain parts of the year. This limitation generally is not severe during most of the cropping season. The major soils in the Nolin, Petrolia, and the Stendal-Bonnie-Birds associations are subject to flooding, but the flooding generally does not occur during the cropping season and only occasionally causes crop loss. The Alford-Sylvan, Bloomfield-Alvin, and Hosmer associations are subject to erosion.

The major soils in the Bloomfield-Alvin association are well suited to melons and certain other speciality crops. The major soils in the Alford-Sylvan association are well suited to orchards and nursery crops. These soils warm up earlier in the spring than the wetter soils.

All of the associations are well suited to woodland. Stands of native hardwoods are common throughout the county, but stands of commercially valuable trees are less common in areas of the Nolin, Petrolia, and Stendal-Bonnie-Birds associations.

Most of the associations are well suited to parks and other recreational developments. The steeper areas of the Alford-Sylvan and Bloomfield-Alvin associations support stands of native hardwoods, which provide habitat for many species of upland wildlife. Undrained areas of the Vincennes-Zipp association and uncultivated areas of the Nolin and Stendal-Bonnie-Birds associations are good nature-study areas. These areas also provide habitat for a wide variety of wildlife.

Detailed Soil Map Units

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

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

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

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

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alford silt loam, 6 to 12 percent slopes, eroded, is a phase of the Alford series.

Some map units are made up of two or more major soils. These map units are called soil complexes. A *soil complex* consists of two or more soils, or one or more soils and a miscellaneous area, in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Alford-Parke silt loams, 18 to 50 percent slopes, is an example.

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

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

The names, descriptions, and delineations of the soils identified on the detailed soil maps of this county do not always agree or join fully with those of the soils identified on the maps of adjoining counties published at an earlier date. Some differences are the result of changes in concepts of soil series. Other differences result from variations in the extent of the soils. Others are the result of variations in the slope range allowed in the map units.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of Tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils.

Soil Descriptions

Ad—Adrian-Rensselaer complex, drained. These nearly level, deep, very poorly drained soils are on river terraces. The Adrian soil is on the lower parts of the landscape. The Rensselaer soil is on the slightly higher flats. Areas are irregular in shape and are 15 to 100 acres in size. The dominant size is about 50 acres. The areas are about 50 to 60 percent Adrian soil and 30 to 40 percent Rensselaer soil. The two soils occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the surface layer of the Adrian soil is black muck about 8 inches thick. The next layer is black, friable muck about 22 inches thick. The underlying material to a depth of about 60 inches is light brownish gray, mottled, calcareous sand. In some places the surface layer is 4 to 10 inches of sandy overwash. In other places the muck extends to a depth of more than 60 inches.

Typically, the surface layer of the Rensselaer soil is black mucky loam about 9 inches thick. The subsurface layer is black mucky silty clay loam about 15 inches thick. The upper 24 inches of the underlying material is gray, mottled, firm silty clay loam. The lower part to a

depth of about 60 inches is olive gray sand. In places the surface layer is silty clay loam or clay loam.

Included with these soils in mapping are the very poorly drained Lyles and Montgomery and poorly drained Patton soils. These included soils do not have a mucky surface layer and are deeper to the underlying sand than the Adrian and Rensselaer soils. They are in landscape positions similar to those of the Adrian and Rensselaer soils. Also included are undrained areas of the Adrian and Rensselaer soils. Included soils make up about 10 percent of the map unit.

The Adrian and Rensselaer soils have a high or very high available water capacity. The Rensselaer soil is moderately permeable. The Adrian soil is moderately slowly permeable to moderately rapidly permeable in the organic material and rapidly permeable in the sandy underlying material. The organic matter content is very high in the surface layer of both soils. Runoff is very slow. The water table is above or near the surface during winter and early spring.

Most areas are drained and are used for cultivated crops. A few are wooded or are used for hay and pasture.

If drained, these soils are suitable for corn and soybeans. The wetness is the main limitation. A drainage system is needed to lower the water table. Subsurface drains, surface drains, and open ditches help to remove excess water. Pumps are needed in some areas. Cover crops and crop residue management help to control soil blowing, improve tilth, and increase the organic matter content. The soils are well suited to spring plowing, fall plowing, and fall chiseling and to till-plant and ridge-plant cropping systems.

These soils are fairly well suited to grasses and legumes for hay and pasture. They are better suited to grasses, such as reed canarygrass and orchardgrass, than to deep-rooted legumes because of the seasonal high water table. A drainage system is needed. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

These soils are well suited to trees. The equipment limitation, seedling mortality, the windthrow hazard, and plant competition are management concerns. Equipment should be used only during dry periods or when the ground is frozen. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling. The species that can withstand the wetness should be selected for planting. Some replanting may be necessary. Windthrown trees should be removed periodically.

Because of low strength and ponding, these soils are generally unsuitable as sites for dwellings and septic tank absorption fields. They are severely limited as sites for local roads because of ponding, frost action, and low strength. Constructing the roads on raised, well compacted fill material helps to prevent the damage caused by ponding. A more stable base material, such as sand or gravel, and properly designed roadside ditches and culverts improve the ability of the roads to support vehicular traffic.

The land capability classification is IVw. The woodland ordination symbol assigned to the Adrian soil is 2W, and that assigned to the Rensselaer soil is 5W.

AlA—Alford silt loam, 0 to 2 percent slopes. This nearly level, deep, well drained soil is on ridgetops and knolls in the uplands. Areas are generally irregular in shape and are 5 to 40 acres in size. The dominant size is about 20 acres.

Typically, the surface layer is dark grayish brown silt loam about 9 inches thick. The subsoil to a depth of about 80 inches is friable silt loam. The upper part is yellowish brown, the next part is dark brown, and the lower part is dark yellowish brown. In some areas the slope is more than 2 percent.

Included with this soil in mapping are the somewhat poorly drained Iva and poorly drained Peoga soils in depressions. These soils make up about 2 percent of the map unit.

The Alford soil has a high available water capacity. Permeability is moderate. The organic matter content is moderate in the surface layer. Runoff is slow.

Most areas of this soil are used for cultivated crops. Some small areas are used for hay, pasture, or woodland.

This soil is well suited to corn, soybeans, and small grain. Cover crops, green manure crops, and a system of conservation tillage that leaves all or part of the crop residue on the surface help to maintain the organic matter content and tilth. The soil is well suited to till-plant and no-till cropping systems.

This soil is well suited to grasses, such as orchardgrass, and legumes, such as alfalfa, for hay or pasture. Overgrazing results in surface compaction and poor tilth and reduces plant density and hardiness. Proper stocking rates, timely deferment of grazing, restricted use during wet periods, and rotation grazing during the summer months minimize surface compaction, help to maintain good plant density and hardiness, and help to keep the pasture in good condition.

This soil is well suited to trees. Plant competition is moderate. Seedlings grow well if competing vegetation is controlled by spraying, cutting, or girdling.

Because of the shrink-swell potential, this soil is moderately limited as a site for dwellings. Strengthening foundations, footings, and basement walls and installing foundation drains help to prevent the structural damage caused by shrinking and swelling. The soil is severely limited as a site for local roads and streets because of frost action and low strength. A more stable base material, such as sand or gravel, and adequate roadside ditches and culverts help to overcome these limitations.

The soil is suitable as a site for septic tank absorption fields.

The land capability classification is I. The woodland ordination symbol is 5A.

AlB2—Alford silt loam, 2 to 6 percent slopes, eroded. This gently sloping, deep, well drained soil is on ridgetops and side slopes in the uplands. Areas are generally irregular in shape and are 15 to 100 acres in size. The dominant size is about 35 acres.

Typically, the surface layer is brown silt loam about 12 inches thick. It is mixed with some yellowish brown subsoil material. The subsoil is yellowish brown, friable silt loam about 64 inches thick. The underlying material to a depth of about 80 inches is yellowish brown silt. In some places the subsoil has grayish mottles. In other places the slope is less than 2 or more than 6 percent.

Included with this soil in mapping are the somewhat excessively drained Bloomfield and well drained Alvin soils. These soils are in landscape positions similar to those of the Alford soil. They are more sandy than the Alford soil. Also included are uneroded and severely eroded areas. Included soils make up about 5 percent of the map unit.

The Alford soil has a high available water capacity. Permeability is moderate. The organic matter content is moderately low in the surface layer. Runoff is medium.

Most areas of this soil are used for cultivated crops. Some are used for hay, pasture, or woodland.

This soil is well suited to corn, soybeans, and small grain. Water erosion is the main hazard. It can be controlled by terraces, diversions, water- and sediment-control basins, a system of conservation tillage that leaves protective amounts of crop residue on the surface, contour farming, a crop rotation that includes grasses and legumes, grade stabilization structures, and a permanent cover of vegetation. The soil is well suited to till-plant and no-till cropping systems.

This soil is well suited to grasses and legumes, such as orchardgrass and alfalfa, for hay and pasture. Water erosion is a hazard. Grazing during wet periods results in surface compaction, poor tilth, and excessive runoff. Proper stocking rates and timely deferment of grazing help to control erosion, minimize compaction, and keep the pasture in good condition.

This soil is well suited to trees. Plant competition is moderate. Seedlings grow well if competing vegetation is controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the shrink-swell potential, this soil is moderately limited as a site for dwellings. Strengthening foundations, footings, and basements walls and installing oversized footings help to prevent the structural damage caused by shrinking and swelling. The soil is severely limited as a site for local roads and streets because of frost action and low strength. Properly designed roadside ditches and culverts and a more stable base material, such as sand and gravel, improve the ability of the roads and streets to support vehicular traffic. The soil is suitable as a site for septic tank absorption fields.

The land capability classification is IIe. The woodland ordination symbol is 5A.

AlB3—Alford silt loam, 2 to 6 percent slopes, severely eroded. This gently sloping, deep, well drained soil is on side slopes in the uplands. Areas are irregular in shape and are 3 to 20 acres in size. The dominant size is about 5 acres.

Typically, the surface layer is mixed yellowish brown and brown silt loam about 5 inches thick. In most areas, nearly all of the original darkened surface layer has been removed by erosion and tillage has mixed the rest with the upper part of the subsoil. The subsoil is strong brown, friable silt loam about 50 inches thick. The underlying material to a depth of about 60 inches is dark yellowish brown, mottled silt loam. In some places the subsoil has grayish mottles. In other places the soil is calcareous within a depth of 60 inches.

Included with this soil in mapping are the somewhat excessively drained Bloomfield and well drained Alvin soils. These soils are more sandy than the Alford soil. They are in landscape positions similar to those of the Alford soil. Also included are moderately eroded areas. Included soils make up about 8 percent of the map unit.

The Alford soil has a high available water capacity. Permeability is moderate. The organic matter content is low in the surface layer. Runoff is rapid.

Most areas are used for cultivated crops. This soil is fairly well suited to corn, soybeans, and winter wheat. Water erosion is the main hazard. It can be controlled by crop rotations that include grasses and legumes and by terraces, contour farming, grassed waterways, water- and sediment-control basins, a system of conservation tillage that leaves all or part of the crop residue on the surface, grade stabilization structures, and cover crops. The soil is well suited to till-plant and no-till cropping systems. Crop residue management and cover crops help to maintain soil structure, the organic matter content, and tilth.

This soil is well suited to grasses and legumes, such as orchardgrass and alfalfa, for hay and pasture. Water erosion is a hazard. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to control water erosion and keep the pasture in good condition.

This soil is well suited to trees. Plant competition is moderate. It can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the shrink-swell potential, this soil is moderately limited as a site for dwellings. Strengthening foundations, footings, and basement walls and installing foundation drains and expansion joints help to prevent

the structural damage caused by shrinking and swelling. Backfill of sand or gravel may be needed. The soil is severely limited as a site for local roads and streets because of low strength and frost action. Properly designed roadside ditches and culverts and a more stable base material, such as sand or gravel, improve the ability of the roads and streets to support vehicular traffic. The soil is suitable as a site for septic tank absorption fields.

The land capability classification is IIIe. The woodland ordination symbol is 5A.

AlC2—Alford silt loam, 6 to 12 percent slopes, eroded. This moderately sloping, deep, well drained soil is on side slopes and secondary ridgetops in the uplands. Areas are generally irregular in shape and are 5 to 20 acres in size. The dominant size is about 10 acres.

Typically, the surface layer is mixed brown and yellowish brown silt loam about 6 inches thick. The subsurface layer is dark yellowish brown, friable silt loam about 6 inches thick. The subsoil to a depth of about 80 inches is yellowish brown and dark yellowish brown, friable silt loam. In some areas the soil is calcareous within a depth of 60 inches. In some places the subsoil has grayish mottles. In other places the slope is less than 6 or more than 12 percent.

Included with this soil in mapping are the somewhat excessively drained Bloomfield and well drained Alvin soils. These soils are more sandy than the Alford soil. They are in landscape positions similar to those of the Alford soil. Also included are severely eroded areas. Included soils make up about 8 percent of the map unit.

The Alford soil has a high available water capacity. Permeability is moderate. The organic matter content is moderately low in the surface layer. Runoff is rapid.

Most areas of this soil are used for hay and pasture. Some are used for cultivated crops or woodland.

This soil is fairly well suited to corn, soybeans, and small grain. Water erosion is the main hazard. It can be controlled by terraces, diversions, a system of conservation tillage that leaves protective amounts of crop residue on the surface, cover crops and green manure crops, a crop rotation that includes grasses and legumes, and grade stabilization structures. The soil is well suited to till-plant and no-till cropping systems. Grassed waterways help to control erosion in the drainageways.

This soil is well suited to grasses and legumes, such as orchardgrass and alfalfa, for hay and pasture. Water erosion is a hazard. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to control water erosion and keep the pasture in good condition.

This soil is well suited to trees. Plant competition is moderate. Seedlings grow well if competing vegetation is controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the shrink-swell potential and the slope, this soil is moderately limited as a site for dwellings. Strengthening foundations, footings, and basement walls and installing foundation drains and expansion joints help to prevent the structural damage caused by shrinking and swelling. Land shaping, building housing developments on the contour, installing diversions between lots, and installing retaining walls minimize the problems caused by the slope.

Because of frost action and low strength, this soil is severely limited as a site for local roads and streets. A more stable base material, such as sand or gravel, and adequate roadside ditches and culverts help to prevent the damage caused by low strength and frost action.

Because of the slope, this soil is moderately limited as a site for septic tank absorption fields. Installing the absorption field on the contour helps to overcome this limitation. Alternative methods of sewage disposal should be considered.

The land capability classification is IIIe. The woodland ordination symbol is 5A.

AlC3—Alford silt loam, 6 to 12 percent slopes, severely eroded. This moderately sloping, deep, well drained soil is on side slopes and secondary ridgetops in the uplands. Areas are generally irregular in shape and are 5 to 25 acres in size. The dominant size is about 10 acres.

Typically, the surface layer is mixed dark yellowish brown and brown silt loam about 7 inches thick. In most areas, nearly all of the original darkened surface layer has been removed by erosion and tillage has mixed the rest with the upper part of the subsoil. The subsoil is strong brown and yellowish brown, friable silt loam about 45 inches thick. The underlying material to a depth of about 80 inches is yellowish brown silt loam. In some places the slope is less than 6 or more than 12 percent. In other places the subsoil has grayish mottles. In some areas the soil is calcareous within a depth of 60 inches. In other areas the solum is thicker.

Included with this soil in mapping are the somewhat excessively drained Bloomfield and well drained Alvin soils. These soils are more sandy than the Alford soil. They are in landscape positions similar to those of the Alford soil. Also included are gullied areas and moderately eroded areas. Included soils make up about 8 percent of the map unit.

The Alford soil has a high available water capacity. Permeability is moderate. The organic matter content is low in the surface layer. Runoff is rapid.

Most areas of this soil are used for cultivated crops. Some are used for hay, pasture, or woodland.

This soil is poorly suited to corn, soybeans, and small grain. Water erosion is the main hazard (fig. 5). It can be controlled by terraces, diversions, a system of

conservation tillage that leaves protective amounts of crop residue on the surface, cover crops and green manure crops, a crop rotation that includes grasses and legumes, and grade stabilization structures. The soil is well suited to till-plant and no-till cropping systems. Grassed waterways help to control erosion in drainageways.

This soil is fairly well suited to grasses and legumes for hay and pasture. Examples of suitable grasses are orchardgrass, timothy, and tall fescue, and examples of suitable legumes are alfalfa and red clover. Water erosion is a hazard. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment

Figure 5.—Gully erosion in a cultivated area of Alvin silt loam, 6 to 12 percent slopes, severely eroded.

of grazing, and restricted use during wet periods help to control water erosion and keep the pasture in good condition.

This soil is well suited to trees. Plant competition is moderate. Seedlings grow well if competing vegetation is controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the shrink-swell potential and the slope, this soil is moderately limited as a site for dwellings. Strengthening foundations, footings, and basement walls and installing foundation drains and expansion joints help to prevent the structural damage caused by shrinking and swelling. Land shaping, building housing developments on the contour, installing diversions between lots, and installing retaining walls minimize the problems caused by the slope.

Because of frost action and low strength, this soil is severely limited as a site for local roads and streets. A more stable base material, such as sand and gravel, and adequate roadside ditches and culverts help to prevent the damage caused by low strength and frost action.

This soil is moderately limited as a site for septic tank absorption fields because of the slope. Installing the absorption field on the contour helps to overcome this limitation. Alternative methods of sewage disposal should be considered.

The land capability classification is IVe. The woodland ordination symbol is 5A.

AlD2—Alford silt loam, 12 to 18 percent slopes, eroded. This strongly sloping, deep, well drained soil is on side slopes in the uplands. Areas are generally irregular in shape and are 5 to 30 acres in size. The dominant size is about 10 acres.

Typically, the surface layer is mixed dark grayish brown and yellowish brown silt loam about 9 inches thick. The subsoil is strong brown, yellowish brown, and dark yellowish brown, friable silt loam about 39 inches thick. The underlying material to a depth of about 75 inches is yellowish brown silt. In some areas the slope is less than 12 or more than 18 percent. In some places the soil is calcareous within a depth of 40 inches. In other places the solum is thicker.

Included with this soil in mapping are the somewhat excessively drained Bloomfield and well drained Alvin soils. These soils are more sandy than the Alford soil. They are in landscape positions similar to those of the Alford soil. Also included are severely eroded areas. Included soils make up about 5 percent of the map unit.

The Alford soil has a high available water capacity. Permeability is moderate. The organic matter content is moderately low in the surface layer. Runoff is very rapid.

Most areas of this soil are used for hay, pasture, or woodland. Some are used for cultivated crops.

This soil is poorly suited to corn, soybeans, and small grain. Water erosion is the main hazard. It can be controlled by terraces, diversions, a system of conservation tillage that leaves protective amounts of crop residue on the surface, cover crops and green manure crops, grade stabilization structures, and a cropping system that includes close-growing crops. Grassed waterways help to control erosion in drainageways.

This soil is well suited to grasses and legumes, such as orchardgrass and alfalfa, for hay and pasture. Water erosion is a hazard. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to control water erosion and keep the pasture in good condition.

This soil is well suited to trees. Plant competition is moderate. It can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the slope, this soil is severely limited as a site for dwellings. Land shaping, building housing developments on the contour, installing diversions between lots, and installing retaining walls minimize the problems caused by the slope. The soil is severely limited as a site for local roads and streets because of the slope, low strength, and frost action. A more stable base material, such as sand and gravel, and adequate roadside ditches help to prevent the damage caused by low strength and frost action. Constructing the roads and streets on the contour and land shaping help to overcome the slope.

Because of the slope, this soil is generally unsuitable as a site for septic tank absorption fields. Alternative methods of sewage disposal should be considered.

The land capability classification is IVe. The woodland ordination symbol is 5A.

AlD3—Alford silt loam, 12 to 18 percent slopes, severely eroded. This strongly sloping, deep, well drained soil is on side slopes in the uplands. Areas are generally irregular in shape and are 5 to 30 acres in size. The dominant size is about 20 acres.

Typically, the surface layer is mixed yellowish brown and brown silt loam about 3 inches thick. In most areas, nearly all of the original darkened surface layer has been removed by erosion and tillage has mixed the rest with the upper part of the subsoil. The subsoil is yellowish brown and brown, friable silt loam about 25 inches thick. The underlying material to a depth of about 80 inches is yellowish brown silt loam and silt. In some places the solum is thicker. In other places the slope is less than 12 or more than 18 percent. In some areas the subsoil has grayish mottles. In other areas the soil is calcareous within a depth of 60 inches.

Included with this soil in mapping are the somewhat excessively drained Bloomfield and well drained Alvin soils and well drained soils that have loamy outwash in the lower part of the solum. All of these included soils are in landscape positions similar to those of the Alford

soil. Bloomfield and Alvin soils are more sandy than the Alford soil. Also included are moderately eroded areas and, along drainageways, some areas of soils that are wetter than the Alford soil. Included soils make up about 5 percent of the map unit.

The Alford soil has a high available water capacity. Permeability is moderate. The organic matter content is low in the surface layer. Runoff is very rapid.

Most areas are used for cultivated crops. Some are used for hay, pasture, or woodland. Because of a severe hazard of water erosion, this soil is generally unsuited to cultivated crops and is only fairly well suited to grasses and legumes, such as orchardgrass and alfalfa, for hay and pasture. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to control water erosion and keep the pasture in good condition.

This soil is well suited to trees. Plant competition is moderate. It can be controlled by proper site preparation or by spraying, cutting, or girdling.

Because of the slope, this soil is severely limited as a site for dwellings. Land shaping is necessary in some areas. The buildings should be designed so that they conform to the natural slope of the land. The surface should be disturbed as little as possible, and a vegetative cover should be established as soon as possible.

Because of the slope, low strength, and frost action, this soil is severely limited as a site for local roads and streets. Properly designed roadside ditches and culverts and a more stable base material, such as sand or gravel, help to prevent the damage caused by low strength and frost action. Constructing the roads and streets on the contour and land shaping help to overcome the slope.

Because of the slope, this soil is generally unsuitable as a site for septic tank absorption fields. Alternative methods of sewage disposal should be considered.

The land capability classification is VIe. The woodland ordination symbol is 5A.

AlE—Alford silt loam, 18 to 25 percent slopes. This moderately steep, deep, well drained soil is on side slopes in the uplands. Areas are irregular in shape and are 5 to 50 acres in size. The dominant size is about 25 acres.

Typically, the surface layer is dark grayish brown silt loam about 5 inches thick. The subsoil is friable silt loam about 38 inches thick. It is yellowish brown in the upper part, yellowish brown and mottled in the next part, and yellowish brown in the lower part. The underlying material to a depth of about 80 inches is yellowish brown, mottled silt loam. In places the slope is less than 18 or more than 25 percent.

Included with this soil in mapping are the well drained Parke soils and other soils that have loamy outwash within a depth of 60 inches; the somewhat excessively drained Bloomfield soils; and well drained Taftown soils, which are 40 to 72 inches deep over bedrock. All of these included soils are in landscape positions similar to those of the Alford soil. Bloomfield and Parke soils are more sandy than the Alford soil. Also included are severely eroded areas; gullied areas; and, along drainageways, narrow areas of soils that are wetter than the Alford soil. Included soils make up about 10 percent of the map unit.

The Alford soil has a high available water capacity. Permeability is moderate. The organic matter content is moderately low in the surface layer. Runoff is very rapid.

Most areas are used for hay and pasture. Some are wooded, and a few are used for cultivated crops. This soil is generally unsuited to cultivated crops. The slope limits the use of farm equipment, and the hazard of water erosion is severe.

This soil is fairly well suited to grasses and legumes for pasture. It is poorly suited to hay. Examples of suitable grasses are orchardgrass, tall fescue, and timothy, and examples of suitable legumes are alfalfa, red clover, and lespedeza. Water erosion is a hazard. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to control water erosion and keep the pasture in good condition.

This soil is well suited to trees. The erosion hazard, the equipment limitation, and plant competition are the main management concerns. Logging roads and skid trails should be built on the gentler slopes or on the contour. Special harvesting equipment may be needed. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the slope, this soil is generally unsuitable as a site for dwellings and septic tank absorption fields. It is severely limited as a site for local roads because of the slope, frost action, and low strength. Constructing the roads on the contour and land shaping help to overcome the slope. Properly designed roadside ditches and culverts and a more stable base material, such as sand and gravel, help to prevent the damage caused by low strength and frost action.

The land capability classification is VIe. The woodland ordination symbol is 5R.

AmF—Alford-Parke silt loams, 18 to 50 percent slopes. These moderately steep to very steep, deep, well drained soils are on side slopes in the uplands. The Alford soil is on the slightly higher knolls and ridges. The Parke soil is on the lower side slopes. Areas are irregular in shape and are 5 to 70 acres in size. The dominant size is about 12 acres. The areas are 50 to 60 percent Alford soil and 30 to 40 percent Parke soil. The two soils occur as areas so intricately intermingled that mapping them separately is not practical.

Typically, the surface layer of the Alford soil is very dark grayish brown silt loam about 3 inches thick. The subsurface layer is brown silt loam about 4 inches thick. The subsoil is strong brown and yellowish brown, friable silt loam about 26 inches thick. The underlying material to a depth of about 80 inches is yellowish brown silt loam. In some places the slope is less than 18 percent. In other places the soil is calcareous within a depth of 60 inches. In some areas loamy material is at a depth of 40 to 60 inches.

Typically, the surface layer of the Parke soil is very dark gray silt loam about 2 inches thick. The subsurface layer is yellowish brown silt loam about 6 inches thick. The subsoil is about 66 inches thick. It is friable. It is yellowish brown silt loam in the upper part, yellowish red loam in the next part, and red loam in the lower part. The underlying material to a depth of about 80 inches is yellowish red loam. In a few small areas, it is sandstone and shale residuum. In some places the loamy material is within a depth of 20 inches. In other places the lower part of the solum is yellowish brown. In some areas the slope is less than 18 percent.

Included with these soils in mapping are the well drained Taftown soils. These included soils are shallower to bedrock than the Alford and Parke soils. They are in landscape positions similar to those of the Alford and Parke soils. Also included are severely eroded areas; gullied areas; areas of rock outcrop; and, along drainageways, narrow areas of soils that are wetter than the Alford and Parke soils. Included areas make up about 10 percent of the map unit.

The Alford and Parke soils have a high available water capacity. Permeability is moderate. The organic matter content is moderately low in the surface layer. Runoff is very rapid.

Most areas are wooded. A few are used for hay and pasture. These soils are generally unsuitable as cropland because of the slope and a severe hazard of water erosion. The slope limits the use of farm equipment and the application of erosion-control measures.

These soils are poorly suited to grasses and legumes for pasture. The slope limits the use of pasture renovation equipment, and water erosion is a hazard. Special management is needed to establish and maintain desirable species of grasses and legumes. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to control water erosion and keep the pasture in good condition.

Many areas support native hardwoods. These soils are fairly well suited to trees. The erosion hazard, the equipment limitation, and plant competition are the main management concerns. Logging roads and skid trails should be built on the gentler slopes or on the contour. Ordinary crawler tractors and rubber-tired skidders cannot be operated safely on these slopes. Special logging methods, such as yarding the logs uphill with a cable, may be needed. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because the slope is a severe limitation, these soils are generally unsuitable as sites for dwellings, local roads and streets, and septic tank absorption fields. Low strength and frost action also are severe limitations on sites for local roads and streets. The slope limits the use of construction equipment.

The land capability classification is VIIe. The woodland ordination symbol is 5R.

AnB—Alvin fine sandy loam, 2 to 6 percent slopes. This gently sloping, deep, well drained soil is on the tops of ridges in the uplands. Areas are irregular in shape and are 5 to 30 acres in size. The dominant size is about 10 acres.

Typically, the surface layer is brown fine sandy loam about 9 inches thick. The subsoil is about 49 inches thick. It is yellowish brown, friable fine sandy loam in the upper part; brown, friable sandy loam in the next part; and brown and yellowish brown, very friable sandy loam in the lower part. The underlying material to a depth of about 80 inches is dark yellowish brown loamy sand. In some places the surface layer is loamy sand. In other places the subsoil is silt loam. In some areas the slope is less than 2 or more than 6 percent.

Included with this soil in mapping are the well drained Alford and somewhat excessively drained Bloomfield soils. These soils are in landscape positions similar to those of the Alvin soil. Alford soils are more silty than the Alvin soil. Also included are severely eroded areas and areas of the somewhat poorly drained Ayrshire Variant and poorly drained Junius Variant soils in small depressions. Included soils make up about 15 percent of the map unit.

The Alvin soil has a moderate available water capacity. Permeability is moderate in the subsoil and moderately rapid in the underlying material. The organic matter content is moderately low in the surface layer. Runoff is medium.

Most areas of this soil are used for cultivated crops. Some are used for hay and pasture. A few are wooded or are used for specialty crops, such as melons.

This soil is well suited to corn, soybeans, and winter wheat. Water erosion is the main hazard. It can be controlled by a crop rotation that includes grasses and legumes and by terraces, grassed waterways, a system of conservation tillage that leaves all or part of the crop residue on the surface, grade stabilization structures, and cover crops. More than one of these measures may be needed. The soil is well suited to till-plant and no-till cropping systems. Crop residue management and cover crops help to maintain soil structure, the organic matter content, and tilth.

This soil is well suited to grasses, such as orchardgrass, and legumes, such as alfalfa, for hay and pasture. Water erosion is a hazard. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to control water erosion and keep the pasture in good condition.

A few areas support native hardwoods. This soil is well suited to trees. Plant competition is moderate. It can be controlled by proper site preparation and by cutting, spraying, or girdling.

This soil is suitable as a site for dwellings and septic tank absorption fields. It is moderately limited as a site for local roads and streets because of frost action. Properly designed roadside ditches and culverts and a more stable base material, such as sand or gravel, help to overcome this limitation.

The land capability classification is IIe. The woodland ordination symbol is 4A.

AnC2—Alvin fine sandy loam, 6 to 12 percent slopes, eroded. This moderately sloping, deep, well drained soil is on side slopes in the uplands. Areas are generally irregular in shape and are 5 to 20 acres in size. The dominant size is about 10 acres.

Typically, the surface layer is mixed brown and strong brown fine sandy loam about 9 inches thick. The subsoil is about 41 inches thick. It is strong brown, friable and firm fine sandy loam in the upper part and strong brown, very friable loamy fine sand in the lower part. The underlying material to a depth of about 70 inches is strong brown and brown fine sand. In some places the surface layer is silt loam or loamy fine sand. In other places the slope is less than 6 or more than 12 percent.

Included with this soil in mapping are the well drained Alford and somewhat excessively drained Bloomfield soils. These soils are in landscape positions similar to those of the Alvin soil. Alford soils are more silty than the Alvin soil. Also included are severely eroded areas. Included soils make up about 15 percent of the map unit.

The Alvin soil has a moderate available water capacity. Permeability is moderate in the subsoil and moderately rapid in the underlying material. The organic matter content is moderately low in the surface layer. Runoff is rapid.

Most areas of this soil are used for cultivated crops or for hay and pasture. Some are wooded.

This soil is fairly well suited to corn, soybeans, and small grain. Water erosion and runoff are the main hazards. They can be controlled by terraces, diversions, a system of conservation tillage that leaves protective amounts of crop residue on the surface, stripcropping, cover crops and green manure crops, a crop rotation that includes grasses and legumes, and grade stabilization structures. The soil is well suited to a no-till cropping system. Grassed waterways help to control erosion in drainageways.

This soil is well suited to grasses, such as orchardgrass, and legumes, such as alfalfa, for hay and pasture. Water erosion is a hazard. Overgrazing reduces plant density and hardiness. Proper stocking rates, timely deferment of grazing, and rotation grazing during the summer months help to control water erosion, maintain good plant density and hardiness, and keep the pasture in good condition.

This soil is well suited to trees. Plant competition is moderate. It can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the slope, this soil is moderately limited as a site for dwellings. Land shaping, constructing the buildings on the contour, installing diversions between lots, and installing retaining walls minimize the problems caused by the slope.

Because of the slope and frost action, this soil is moderately limited as a site for local roads and streets. Adequate roadside ditches and culverts help to prevent the damage caused by low strength and frost action. Constructing the roads and streets on the contour and land shaping help to overcome the slope.

Because of the slope, this soil is moderately limited as a site for septic tank absorption fields. Installing the absorption field on the contour helps to overcome this limitation. Alternative methods of sewage disposal should be considered.

The land capability classification is IIIe. The woodland ordination symbol is 4A.

AnC3—Alvin fine sandy loam, 6 to 12 percent slopes, severely eroded. This moderately sloping, deep, well drained soil is on side slopes in the uplands. Areas are generally irregular in shape and are 3 to 100 acres in size. The dominant size is about 10 acres.

Typically, the surface layer is about 5 inches of mixed yellowish brown fine sandy loam and brown sandy loam. In most areas, nearly all of the original darkened surface layer has been removed by erosion and tillage has mixed the rest with the upper part of the subsoil. The subsoil is about 49 inches thick. It is brown, friable sandy loam and fine sandy loam in the upper part and dark yellowish brown and brown, very friable loamy fine sand in the lower part. The underlying material to a depth of about 60 inches is brownish yellow and yellowish brown loamy sand and sand. In some places the surface layer is sandy loam or silt loam. In other places the slope is less than 6 or more than 12 percent.

Included with this soil in mapping are the well drained Alford and somewhat excessively drained Bloomfield soils. These soils are in landscape positions similar to those of the Alvin soil. Alford soils are more silty than the Alvin soil. Also included are uneroded areas. Included soils make up about 8 percent of the map unit.

The Alvin soil has a moderate available water capacity. Permeability is moderate in the subsoil and moderately rapid in the underlying material. The organic matter content is low in the surface layer. Runoff is rapid.

Most areas of this soil are used for cultivated crops. Some are wooded, and a few are used for hay and pasture.

This soil is poorly suited to corn, soybeans, and winter wheat. Water erosion and runoff are the main hazards. They can be controlled by terraces, diversions, grassed waterways, a system of conservation tillage that leaves all or part of the crop residue on the surface, grade stabilization structures, cover crops, and a cropping system that includes close-growing crops. The soil is well suited to a no-till cropping system. Crop residue management and cover crops help to maintain soil structure, the organic matter content, and tilth.

This soil is well suited to grasses, such as orchardgrass, and legumes, such as alfalfa, for hay and pasture. Water erosion is a hazard. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to control water erosion and keep the pasture in good condition.

This soil is well suited to trees. Plant competition is moderate. It can be controlled by proper site preparation and by cutting, girdling, or spraying.

Because of the slope, this soil is moderately limited as a site for dwellings. Land shaping is necessary in some areas. The buildings should be designed so that they conform to the natural slope of the land. The surface should be disturbed as little as possible, and a vegetative cover should be established as soon as possible.

Because of the slope and frost action, this soil is moderately limited as a site for local roads and streets. Properly designed roadside ditches and culverts minimize the damage caused by frost action. Constructing the roads and streets on the contour and land shaping help to overcome the slope.

Because of the slope, this soil is moderately limited as a site for septic tank absorption fields. Installing the absorption field on the contour helps to overcome this limitation.

The land capability classification is IVe. The woodland ordination symbol is 4A.

AnD2—Alvin fine sandy loam, 12 to 18 percent slopes, eroded. This strongly sloping, deep, well drained soil is on side slopes in the uplands. Areas are generally irregular in shape and are 3 to 30 acres in size. The dominant size is about 10 acres.

Typically, the surface layer is about 6 inches of mixed brown fine sandy loam and strong brown sandy loam. The subsoil is about 35 inches thick. It is strong brown, friable sandy loam in the upper part and brown, very friable loamy sand in the lower part. The underlying material to a depth of about 60 inches is reddish yellow loamy sand and dark yellowish brown silt. In places the slope is less than 12 or more than 18 percent.

Included with this soil in mapping are the well drained Alford and somewhat excessively drained Bloomfield soils. These soils are in landscape positions similar to those of the Alvin soil. Alford soils are more silty than the Alvin soil. Also included are severely eroded areas. Included soils make up about 8 percent of the map unit.

The Alvin soil has a moderate available water capacity. Permeability is moderate in the subsoil and moderately rapid in the underlying material. The organic matter content is moderately low in the surface layer. Runoff is very rapid.

Most areas of this soil are used for hay and pasture. Some are wooded, and a few are used for cultivated crops.

This soil is poorly suited to corn, soybeans, and winter wheat. Water erosion and runoff are the main hazards. They can be controlled by a crop rotation that includes grasses and legumes and by terraces, diversions, grassed waterways, a system of conservation tillage that leaves all or part of the crop residue on the surface, grade stabilization structures, and cover crops. The soil is well suited to a no-till cropping system. Crop residue management and cover crops help to maintain soil structure, the organic matter content, and tilth.

This soil is fairly well suited to grasses and legumes for hay and pasture. Examples of suitable grasses are orchardgrass and tall fescue, and examples of suitable legumes are alfalfa and red clover. Water erosion is a hazard. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to control water erosion and keep the pasture in good condition.

This soil is well suited to trees. The erosion hazard, the equipment limitation, and plant competition are the main management concerns. Logging roads and skid trails should be built on the gentler slopes or on the contour. Special harvesting equipment may be needed. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the slope, this soil is severely limited as a site for dwellings and for local roads and streets. Land shaping is necessary in some areas. The buildings should be designed so that they conform to the natural slope of the land. The roads and streets should be built on the contour. Retaining as much of the existing vegetation as possible during construction and revegetating disturbed areas as soon as possible help to control erosion.

Because of the slope, this soil is severely limited as a site for septic tank absorption fields. Installing the

absorption field on the contour helps to overcome this limitation. Alternative methods of sewage disposal should be considered. Public disposal systems may be needed.

The land capability classification is IVe. The woodland ordination symbol is 4R.

AnD3—Alvin fine sandy loam, 12 to 18 percent slopes, severely eroded. This strongly sloping, deep, well drained soil is on side slopes in the uplands. Areas are generally irregular in shape and are 3 to 10 acres in size. The dominant size is about 4 acres.

Typically, the surface layer is yellowish brown fine sandy loam about 4 inches thick. In most areas, nearly all of the original darkened surface layer has been removed by erosion and tillage has mixed the rest with the upper part of the subsoil. The subsoil is about 32 inches thick. In sequence downward, it is dark brown, friable fine sandy loam; strong brown, friable sandy loam; strong brown, very friable sandy loam; and dark yellowish brown and dark brown, very friable loamy fine sand. The underlying material to a depth of about 60 inches occurs as strata of brownish yellow silt loam, yellowish brown loamy fine sand, pale brown loamy fine sand, and light yellowish brown silt. In some places the slope is less than 12 or more than 18 percent. In other places the surface layer is silt loam or sandy loam.

Included with this soil in mapping are the well drained Alford and somewhat excessively drained Bloomfield soils. These soils are in landscape positions similar to those of the Alvin soil. Alford soils are more silty than the Alvin soil. Also included are uneroded areas. Included soils make up about 8 percent of the map unit.

The Alvin soil has a moderate available water capacity. Permeability is moderate in the subsoil and moderately rapid in the underlying material. The organic matter content is low in the surface layer. Runoff is very rapid.

Most areas are used for cultivated crops. A few are wooded, and some are used for hay and pasture. Because the hazard of water erosion is severe, this soil is generally unsuited to cultivated crops, is only fairly well suited to grasses and legumes for pasture, and is poorly suited to hay. Examples of suitable grasses are orchardgrass and tall fescue, and examples of suitable legumes are alfalfa and red clover. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to control water erosion and keep the pasture in good condition.

This soil is well suited to trees. The erosion hazard, the equipment limitation, and plant competition are the main management concerns. Logging roads and skid trails should be built on the gentler slopes or on the contour. Special harvesting equipment may be needed. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the slope, this soil is severely limited as a site for dwellings and for local roads and streets. Land shaping is necessary in some areas. The buildings should be designed so that they conform to the natural slope of the land. The roads and streets should be built on the contour. Retaining as much of the existing vegetation as possible during construction and revegetating disturbed areas as soon as possible help to control erosion.

Because of the slope, this soil is severely limited as a site for septic tank absorption fields. Installing the absorption field on the contour helps to overcome this limitation. Careful design is needed. Alternative methods of sewage disposal should be considered. Public disposal systems may be needed.

The land capability classification is VIe. The woodland ordination symbol is 4R.

Ao—Aquents, frequently flooded. These soils are in open excavations from which soil material has been removed for use in the construction of levees. Areas are 3 to 30 acres in size. They are 3 to 10 feet deep. They are subject to flooding during winter and early spring. They are usually filled with water until late spring or early summer. Willow trees and water-tolerant weeds grow in these areas.

The soil material has a wide range in chemical and physical properties. Texture varies. Onsite investigation is needed if alternative land uses are considered.

No land capability classification or woodland ordination symbol is assigned.

Ar—Armiesburg silt loam, occasionally flooded. This nearly level, deep, well drained soil is on bottom land and low river terraces. It is occasionally flooded during winter and early spring. Areas are irregular in shape and are 5 to 60 acres in size. The dominant size is about 25 acres.

Typically, the surface layer is very dark grayish brown silt loam about 5 inches thick. The subsurface layer is very dark gray silt loam about 13 inches thick. The subsoil is about 43 inches thick. It is dark yellowish brown and friable. It is silt loam in the upper part, silty clay loam in the next part, and mottled silty clay loam in the lower part. The underlying material to a depth of about 80 inches is grayish brown, mottled clay loam. In some small areas lighter colored overwash is on the surface. In other small areas the dark surface soil is less than 10 inches thick.

Included with this soil in mapping are the well drained Landes and moderately well drained Medway soils. These soils are in landscape positions similar to those of the Armiesburg soil. Landes soils are more sandy than the Armiesburg soil. Also included are the poorly drained Vincennes soils and soils that are more sloping than the

Armiesburg soil. Vincennes soils are in small depressions, and the more sloping soils are along old stream channels. Included soils make up about 5 percent of the map unit.

The Armiesburg soil has a high available water capacity. Permeability is moderate. The organic matter content is moderate in the surface layer. Runoff is slow.

Most areas of this soil are used for cultivated crops. A few are used as woodland, hayland, or pasture.

This soil is well suited to corn, soybeans, and winter wheat. The flooding is the main hazard. It generally does not occur during the cropping season and only occasionally causes crop damage. Levees can control the flooding, but they are extremely expensive if they are constructed to achieve total protection. Cover crops and crop residue management improve tilth and increase the organic matter content. The soil is well suited to a no-till cropping system.

This soil is well suited to grasses and legumes for hay and pasture. Examples of suitable legumes are ladino clover and red clover. The flooding is a hazard. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. Plant competition is moderate. It can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the flooding, this soil is generally unsuitable as a site for dwellings and septic tank absorption fields. It is severely limited as a site for local roads because of the flooding, low strength, and frost action. Constructing the roads on raised, well compacted fill material helps to prevent the damage caused by floodwater. Properly designed roadside ditches and culverts and a more stable base material, such as sand and gravel, help to prevent the damage caused by low strength and frost action.

The land capability classification is IIw. The woodland ordination symbol is 8A.

As—Armiesburg silt loam, protected. This nearly level, deep, well drained soil is on bottom land and low river terraces. It is subject to rare flooding. Areas are irregular in shape and are 5 to 60 acres in size. The dominant size is about 25 acres.

Typically, the surface soil is dark gray silt loam about 16 inches thick. The subsoil is friable silt loam about 32 inches thick. It is brown in the upper part and dark yellowish brown in the lower part. The underlying material to a depth of about 60 inches is dark yellowish brown silt loam. In some areas lighter colored overwash is on the surface. In some places the dark surface soil is less than 10 inches thick. In other places the underlying material is medium acid.

Included with this soil in mapping are the moderately well drained Medway and poorly drained Vincennes soils. Medway soils are in landscape positions similar to those of the Armiesburg soil. Vincennes soils are in small depressions. Also included, along old stream channels, are soils that have a slope of more than 6 percent. Included soils make up about 5 percent of the map unit.

The Armiesburg soil has a high available water capacity. Permeability is moderate. The organic matter content is moderate in the surface layer. Runoff is slow.

Most areas of this soil are used for cultivated crops. A few are wooded or are used for hay and pasture.

This soil is well suited to corn, soybeans, and winter wheat. Cover crops and crop residue management improve tilth and increase the organic matter content. The soil is well suited to spring plowing, spring chiseling, and a no-till cropping system.

This soil is well suited to grasses and legumes for hay and pasture. Examples of suitable grasses are orchardgrass and tall fescue, and examples of suitable legumes are alfalfa and red clover. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. Plant competition is moderate. It can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the flooding, this soil is generally unsuitable as a site for dwellings and septic tank absorption fields. It is severely limited as a site for local roads because of low strength and frost action. Properly designed roadside ditches and culverts and a more stable base material, such as sand and gravel, help to prevent the damage caused by low strength and frost action.

The land capability classification is I. The woodland ordination symbol is 8A.

Ay—Ayrshire Variant fine sandy loam. This nearly level, deep, somewhat poorly drained soil is in the uplands. Areas are irregular in shape and are 3 to 50 acres in size. The dominant size is about 5 acres.

Typically, the surface layer is brown fine sandy loam about 8 inches thick. The subsurface layer is about 6 inches of light gray, mottled fine sandy loam. The subsoil is about 40 inches thick. It is mottled and friable. It is yellowish brown loam in the upper part, light brownish gray loam and fine sandy loam in the next part, and light gray fine sandy loam in the lower part. The underlying material to a depth of about 80 inches is light gray, mottled fine sandy loam. In some areas it is more sandy. In a few areas the soil has coarse fragments. In some places the subsurface layer is browner. In other places the control section has less clay.

Included with this soil in mapping are the somewhat excessively drained Bloomfield and well drained Alvin soils in the higher landscape positions. Also included are the poorly drained Junius Variant soils in the slightly lower positions. Included soils make up about 5 percent of the map unit.

The Ayrshire Variant soil has a high available water capacity. Permeability is moderate. The organic matter content is low in the surface layer. Runoff is slow. The water table is at a depth of 1 to 3 feet during winter and early spring.

Most areas of this soil are drained and are used for cultivated crops. Some are wooded or are used for hay and pasture.

If drained, this soil is well suited to corn, soybeans, and winter wheat. The wetness is the main limitation. Subsurface drains, surface drains, and open ditches help to remove excess water. Cover crops and crop residue management improve tilth and increase the organic matter content. The soil is well suited to fall chiseling and to a till-plant cropping system.

This soil is well suited to grasses and legumes for hay and pasture. It is better suited to grasses than to deep-rooted legumes because of the seasonal high water table. Examples of suitable grasses are orchardgrass and tall fescue, and examples of suitable legumes are ladino clover and red clover. A drainage system is needed. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. No major hazards or limitations affect planting or harvesting.

Because of the wetness, this soil is severely limited as a site for dwellings. Subsurface drains help to lower the water table. Footing drains and sump pumps may be needed. The walls of dwellings with basements should be properly sealed. Also, the footing drains should be backfilled with sand.

Because of frost action, this soil is severely limited as a site for local roads and streets. Properly designed roadside ditches and culverts and a more stable base material, such as sand or gravel, help to prevent the damage caused by frost action.

Because of the wetness, this soil is severely limited as a site for septic tank absorption fields. Installing interceptor drains around the absorption field lowers the water table. Alternative methods of sewage disposal should be considered. Public disposal systems generally are needed.

The land capability classification is IIw. The woodland ordination symbol is 5A.

Bd—Birds silt loam, frequently flooded. This nearly level, deep, poorly drained soil is on bottom land. It is frequently flooded during winter and early spring and is subject to ponding. Areas are irregular in shape and are 5 to 10 acres in size. The dominant size is about 10 acres.

Typically, the surface layer is dark grayish brown silt loam about 12 inches thick. The subsoil to a depth of about 80 inches is silt loam. The upper part is light brownish gray and light gray, mottled, and friable, and the lower part is gray, mottled, and firm. In some places the upper part of the subsoil has more clay. In other places the upper part of the soil is more acid.

Included with this soil in mapping are the moderately well drained Wilbur and somewhat poorly drained Wakeland soils in the slightly higher landscape positions. Also included are marshy spots in undrained areas. Included soils make up about 10 percent of the map unit.

The Birds soil has a very high available water capacity. Permeability is moderately slow. The organic matter content is moderate in the surface layer. Runoff is slow. The water table is near or above the surface in late winter and in spring.

Most areas of this soil are drained and are used for cultivated crops. Some are wooded. A few are used for hay and pasture.

If drained, this soil is fairly well suited to corn and soybeans. The flooding is the main hazard, and the wetness is the main limitation. The flooding generally does not occur during the cropping season and only occasionally causes crop damage. Levees can control the flooding, but they are extremely expensive if they are constructed to provide total protection. Subsurface drains, surface drains, and open ditches help to remove excess water. Cover crops and crop residue management improve tilth and increase the organic matter content.

This soil is well suited to grasses and legumes for hay and pasture. It is better suited to grasses than to deep-rooted legumes because of the seasonal high water table. Examples of suitable grasses are reed canarygrass and tall fescue, and an example of a suitable legume is ladino clover. A drainage system is needed. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

Some areas support native hardwoods. This soil is well suited to trees. The equipment limitation, seedling mortality, the windthrow hazard, and plant competition are management concerns. Equipment should be used only during dry periods or when the ground is frozen. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling. The species that can withstand the wetness should be selected for planting. Some replanting may be necessary. Windthrown trees should be removed periodically.

Because of the ponding and the flooding, this soil is generally unsuitable as a site for dwellings and sanitary facilities. It is severely limited as a site for local roads

because of the ponding, the flooding, and low strength. Constructing the roads on raised, well compacted fill material helps to prevent the damage caused by ponding and flooding. Providing a more stable base material, such as sand or gravel, improves the ability of the roads to support vehicular traffic.

The land capability classification is IIIw. The woodland ordination symbol is 5W.

BlA—Bloomfield sand, 0 to 2 percent slopes. This nearly level, deep, somewhat excessively drained soil is on ridgetops in the uplands and on high benches. Areas are irregular in shape and are 5 to 100 acres in size. The dominant size is about 20 acres.

Typically, the surface layer is dark yellowish brown sand about 8 inches thick. The subsoil is strong brown loamy fine sand about 17 inches thick. The underlying material to a depth of about 60 inches is yellowish brown loamy fine sand. In some areas the slope is more than 2 percent. In some places the soil has a dark surface layer 10 or more inches thick. In other places it has horizontal bands in the lower part.

Included with this soil in mapping are the somewhat poorly drained Ayrshire Variant and poorly drained Junius Variant soils in depressions. Also included are the well drained Alford and Alvin soils in landscape positions similar to those of the Bloomfield soil. Included soils make up about 10 percent of the map unit.

The Bloomfield soil has a low available water capacity. Permeability is rapid. The organic matter content is moderately low in the surface layer. Runoff is very slow.

Most areas of this soil are used for cultivated crops. Some are used for hay and pasture. A few are wooded.

This soil is fairly well suited to corn, soybeans, winter wheat, and melons. Drought and soil blowing are the main hazards. Properly managing crop residue and adding organic material, such as animal waste, improve the available water capacity and conserve moisture. The soil is well suited to a no-till cropping system.

This soil is well suited to grasses and legumes for hay and pasture. Examples of suitable grasses are orchardgrass, timothy, and tall fescue, and examples of suitable legumes are alfalfa and red clover. Soil blowing and drought are the main hazards. Proper stocking rates, pasture rotation, and deferment of grazing during dry periods help to control soil blowing and keep the pasture in good condition.

This soil is well suited to trees. Seedling mortality is the main management concern. Planting containerized stock reduces the seedling mortality rate. Some replanting may be necessary.

This soil is suitable as a site for dwellings and for local roads and streets. It is severely limited as a site for septic tank absorption fields because of a poor filtering capacity. Careful planning is needed to prevent the contamination of nearby shallow wells. Adding suitable fill material improves the filtering capacity. Public or commercial disposal systems may be needed.

The land capability classification is IIIs. The woodland ordination symbol is 4S.

BlB—Bloomfield sand, 2 to 6 percent slopes. This gently sloping, deep, somewhat excessively drained soil is on ridgetops and side slopes in the uplands. Areas are irregular in shape and are 2 to 30 acres in size. The dominant size is about 15 acres.

Typically, the surface layer is very dark gray and brown sand about 8 inches thick. The subsurface layer is about 22 inches of strong brown, very friable loamy fine sand. The next 31 inches is yellowish brown, very friable loamy fine sand that has thin bands of brown material. Below this to a depth of about 80 inches is brown bands and yellowish brown interbands of very friable loamy fine sand. In some places the bands do not have a total thickness of 6 inches or more in the upper 60 inches. In other places the soil has a continuous subsoil of sandy loam or sandy clay loam below a depth of 30 inches. In some areas the slope is less than 2 or more than 6 percent. In a few areas the solum has strata of silt loam.

Included with this soil in mapping are the somewhat poorly drained Ayshire Variant and poorly drained Junius Variant soils in depressions. Also included are the well drained Alford and Alvin soils, severely eroded areas, and spots of calcareous soils. Alford and Alvin soils are in landscape positions similar to those of the Bloomfield soil. Included soils make up about 10 percent of the map unit.

The Bloomfield soil has a low available water capacity. Permeability is rapid. The organic matter content is low in the surface layer. Runoff is slow.

Most areas of this soil are used for cultivated crops. Some are used for hay and pasture or are wooded.

This soil is fairly well suited to corn, soybeans, winter wheat, and melons. Drought and soil blowing are the main hazards. Properly managing crop residue and adding organic material, such as animal waste, help to control soil blowing, improve the available water capacity, and conserve moisture. The soil is well suited to a no-till cropping system.

This soil is well suited to grasses and legumes for hay and pasture. Examples of suitable grasses are orchardgrass, timothy, and tall fescue, and examples of suitable legumes are alfalfa and red clover. Drought and soil blowing are the main hazards. Proper stocking rates, pasture rotation, and deferment of grazing during dry periods help to keep the pasture in good condition.

This soil is well suited to trees. Seedling mortality is the main management concern. Planting containerized stock reduces the seedling mortality rate. Some replanting may be necessary.

This soil is suitable as a site for dwellings and for local roads and streets. It is severely limited as a site for septic tank absorption fields because of a poor filtering

capacity. Careful planning is needed to prevent the contamination of nearby shallow wells. Adding suitable fill material improves the filtering capacity. Public or commercial disposal systems may be needed.

The land capability classification is IIIs. The woodland ordination symbol is 4S.

BIC—Bloomfield sand, 6 to 12 percent slopes. This moderately sloping, deep, somewhat excessively drained soil is on side slopes in the uplands. Areas are irregular in shape and are 5 to 30 acres in size. The dominant size is about 15 acres.

Typically, the surface layer is brown sand about 8 inches thick. The subsurface layer is strong brown, very friable loamy sand about 22 inches thick. The next 31 inches is strong brown, loose sand that has bands of reddish brown, very friable sand. Below this to a depth of about 80 inches are bands of reddish brown, very friable sand and interbands of yellowish brown, loose sand. In some places the bands do not have a total thickness of 6 inches or more in the upper 60 inches. In other places the soil has a continuous subsoil of sandy loam or sandy clay loam below a depth of 30 inches. In some areas the slope is less than 6 or more than 12 percent. In other areas the solum has strata of silt loam.

Included with this soil in mapping are the well drained Alford and Alvin soils. These soils are in landscape positions similar to those of the Bloomfield soil. Also included are moderately eroded and severely eroded areas and areas where the soil is calcareous at the surface. Included soils make up about 10 percent of the map unit.

The Bloomfield soil has a low available water capacity. Permeability is rapid. The organic matter content is low in the surface layer. Runoff is medium.

Most areas of this soil are used for cultivated crops. Some are used for hay and pasture or are wooded.

This soil is fairly well suited to corn, soybeans, winter wheat, and melons. Soil blowing and water erosion are the main hazards. They can be controlled by grassed waterways, a system of conservation tillage that leaves all or part of the crop residue on the surface, grade stabilization structures, cover crops, and a cropping system that includes close-growing crops. More than one of these measures may be needed. The soil is well suited to a no-till cropping system. Diversions help to control runoff. Crop residue management and cover crops improve or help to maintain soil structure, the organic matter content, and tilth. Crops are affected by droughtiness when rainfall is insufficient or poorly distributed. Properly managing crop residue and adding organic material, such as animal waste, improve the available water capacity and conserve moisture.

This soil is well suited to grasses and legumes for hay and pasture. Examples of suitable grasses are orchardgrass, timothy, and tall fescue, and examples of suitable legumes are alfalfa and red clover. Water erosion and soil blowing are the main hazards, and the low available water capacity is the main limitation. Proper stocking rates, pasture rotation, and deferment of grazing during dry periods help to prevent excessive soil loss and keep the pasture in good condition.

Some areas support native hardwoods. This soil is well suited to trees. Seedling mortality is the main management concern. Planting containerized stock reduces the seedling mortality rate. Some replanting may be necessary.

Because of the slope, this soil is moderately limited as a site for dwellings and for local roads and streets. This limitation can be overcome by cutting and filling on sites for dwellings and by building roads and streets on the contour. The dwellings should be designed so that they conform to the natural slope of the land. The plant cover should be disturbed as little as possible during construction, and a protective plant cover should be established as soon as possible after construction.

This soil is severely limited as a site for septic tank absorption fields because of a poor filtering capacity. Careful planning is needed to prevent the contamination of nearby shallow wells. Adding suitable fill material improves the filtering capacity. Public or commercial disposal systems may be needed.

The land capability classification is IIIe. The woodland ordination symbol is 4S.

BID—Bloomfield sand, 12 to 18 percent slopes. This strongly sloping, deep, somewhat excessively drained soil is on side slopes in the uplands. Areas are irregular in shape and are 2 to 20 acres in size. The dominant size is about 10 acres.

Typically, the surface layer is yellowish brown sand about 10 inches thick. The subsurface layer is about 9 inches of yellowish brown loamy fine sand. The next 25 inches is yellowish brown, very friable loamy fine sand that has thin bands of brown material. Below this is about 12 inches of brown bands and yellowish brown, very friable interbands of loamy fine sand. The underlying material to a depth of about 70 inches is yellow sand. In some places the solum is thinner. In other places the bands do not have a total thickness of 6 inches or more in the upper 60 inches. In a few places the soil has a continuous subsoil of sandy loam or sandy clay loam below a depth of 30 inches. In some areas the slope is less than 12 or more than 18 percent. In other areas the solum has strata of silt loam.

Included with this soil in mapping are the well drained Alford and Alvin soils. These soils are in landscape positions similar to those of the Bloomfield soil. Also included are severely eroded areas and areas of soils that are calcareous at the surface. Included soils make up about 5 percent of the map unit.

The Bloomfield soil has a low available water capacity. Permeability is rapid. The organic matter content is low in the surface layer. Runoff is medium.

Most areas of this soil are used for hay and pasture. Some are wooded, and a few are used for cultivated crops.

This soil is poorly suited to corn and soybeans. Soil blowing and water erosion are the main hazards. They can be controlled by a crop rotation that includes grasses and legumes and by grassed waterways, a system of conservation tillage that leaves part or all of the crop residue on the surface, grade stabilization structures, and cover crops. The soil is well suited to a no-till cropping system. Crops are affected by droughtiness when rainfall is insufficient or poorly distributed. Properly managing crop residue and adding organic material, such as animal waste, improve the available water capacity and conserve moisture.

This soil is fairly well suited to grasses and legumes for hay and pasture. Examples of suitable grasses are orchardgrass, timothy, and tall fescue, and examples of suitable legumes are alfalfa and red clover. Water erosion and soil blowing are the main hazards, and the low available water capacity is the main limitation. Proper stocking rates, pasture rotation, and deferment of grazing during dry periods help to prevent excessive soil loss and keep the pasture in good condition.

This soil is well suited to trees. Seedling mortality is the main management concern. Planting containerized stock reduces the seedling mortality rate. Some replanting may be necessary.

Because of the slope, this soil is moderately limited as a site for dwellings and for local roads and streets. The dwellings and the roads and streets should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas. The surface should be disturbed as little as possible during construction, and a protective plant cover should be established as soon as possible after construction.

Because of a poor filtering capacity, this soil is severely limited as a site for septic tank absorption fields. Careful planning is needed to prevent the contamination of nearby shallow wells. Adding suitable fill material improves the filtering capacity. Alternative sites for waste disposal should be selected. Public or commercial disposal systems may be needed.

The land capability classification is IVe. The woodland ordination symbol is 4S.

BlF—Bloomfield sand, 18 to 50 percent slopes. This moderately steep to very steep, deep, somewhat excessively drained soil is on side slopes in the uplands. Areas are irregular in shape and are 3 to 50 acres in size. The dominant size is about 15 acres.

Typically, the surface layer is very dark grayish brown sand about 3 inches thick. The subsurface layer is about 25 inches of yellowish brown loamy fine sand. The next 43 inches is yellowish brown, very friable loamy fine sand that has brown bands. The underlying material to a depth of about 80 inches is light yellowish brown sand. In some places the solum is thinner. In other places the bands do not have a total thickness of 6 inches or more in the upper 60 inches. In a few places the soil has a continuous subsoil of sandy loam or sandy clay loam below a depth of 30 inches. In some areas the slope is less than 18 percent. In other areas the solum has strata of silt loam.

Included with this soil in mapping are the well drained Alford and Sylvan soils. These soils are in landscape positions similar to those of the Bloomfield soil. Also included are severely eroded areas, some gullied areas, and soils that are calcareous at the surface. Included soils make up about 5 percent of the map unit.

The Bloomfield soil has a low available water capacity. Permeability is rapid. The organic matter content is low in the surface layer. Runoff is rapid.

Most areas are wooded. A few are used for hay and pasture. Because of the slope, this soil is generally unsuitable as cropland. The slope limits the use of farm equipment. The low available water capacity is the main limitation, and the hazard of erosion is severe.

This soil is fairly well suited to grasses and legumes for pasture. It is poorly suited to hay. Examples of suitable grasses are orchardgrass, timothy, and tall fescue, and examples of suitable legumes are alfalfa and red clover. The slope limits the use of haying equipment. Water erosion and soil blowing are the main hazards. Proper stocking rates, timely deferment of grazing, and pasture rotation help to prevent excessive soil loss and keep the pasture in good condition.

This soil is well suited to trees. The hazard of erosion, the equipment limitation, and seedling mortality are the main management concerns. Logging roads and skid trails should be built on the gentler slopes or on the contour. Special harvesting equipment may be needed. Planting containerized stock reduces the seedling mortality rate. Some replanting may be necessary.

Because of the slope, this soil is generally unsuitable as a site for dwellings, septic tank absorption fields, and local roads and streets. The slope severely limits the use of construction equipment.

The land capability classification is VIe. The woodland ordination symbol is 4R.

Bo—Bonnie silt loam, frequently flooded. This nearly level, deep, poorly drained soil is on bottom land. It is frequently flooded during winter and early spring and is subject to ponding. Areas are irregular in shape and are 15 to 70 acres in size. The dominant size is about 20 acres.

Typically, the surface layer is grayish brown silt loam about 8 inches thick. The subsoil is gray, mottled, friable silt loam about 9 inches thick. The underlying material to a depth of about 60 inches is light brownish gray and grayish brown, mottled silt loam. In places it is less acid.

Included with this soil in mapping are the moderately well drained Steff and somewhat poorly drained Stendal

soils in the slightly higher landscape positions. Also included are marshy spots. Included soils make up about 10 percent of the map unit.

The Bonnie soil has a very high available water capacity. Permeability is moderately slow. The organic matter content is moderately low in the surface layer. Runoff is very slow. The water table is above or near the surface during winter and early spring.

Most areas of this soil are used for cultivated crops. Some are wooded, and a few are used for hay and pasture.

If drained, this soil is fairly well suited to corn, soybeans, and winter wheat. The wetness is the main limitation, and the flooding is the main hazard. Subsurface drains, surface drains, and open ditches help to remove excess water. The flooding generally does not occur during the cropping season and only occasionally causes crop damage. Levees can control the flooding, but they are extremely expensive if they are constructed to provide total protection. Cover crops and crop residue management improve tilth and increase the organic matter content.

This soil is well suited to grasses and legumes for hay and pasture. It is better suited to grasses than to deep-rooted legumes because of the seasonal high water table. An example of a suitable grass is reed canarygrass, and an example of a suitable legume is ladino clover. The wetness is the main limitation, and the flooding is the main hazard. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. The equipment limitation, seedling mortality, the windthrow hazard, and plant competition are management concerns. The trees should be harvested during dry periods or when the ground is frozen. Water-tolerant trees should be selected for planting. Some replanting may be necessary. Protective borders or windbreaks on the windward side of the wooded tracts help to prevent windthrow. Windthrown trees should be periodically removed. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the ponding and the flooding, this soil is generally unsuitable as a site for dwellings and septic tank absorption fields. It is severely limited as a site for local roads because of the flooding, the ponding, and low strength. Properly designed roadside ditches and culverts and a more stable base material, such as sand or gravel, improve the ability of the roads to support vehicular traffic. Constructing the roads on raised, well compacted fill material helps to prevent the damage caused by ponding and flooding.

The land capability classification is IIIw. The woodland ordination symbol is 5W.

Bp—Bonnie silt loam, ponded. This nearly level, deep, poorly drained soil is on broad flood plains. It is ponded for long periods by runoff from the higher adjacent areas. Also, it is frequently flooded for long periods. Areas are irregular in shape and are 3 to 200 acres in size.

Typically, the surface layer is grayish brown silt loam about 4 inches thick. The subsoil is gray, mottled silt loam about 14 inches thick. The underlying material to a depth of about 60 inches is gray, mottled silt loam. In places it is less acid. In some areas the surface layer is silty clay loam.

Included with this soil in mapping are the moderately well drained Steff and somewhat poorly drained Stendal soils in the slightly higher landscape positions. These soils make up about 5 to 10 percent of the map unit.

The Bonnie soil has a very high available water capacity. Permeability is moderately slow. The organic matter content is moderately low in the surface layer. Water ponds on the surface most of the year.

Most areas support marsh vegetation. Some are managed as wildlife habitat. This soil is generally unsuited to cultivated crops and to grasses and legumes for hay and pasture because of the flooding and the ponding. Overcoming these hazards is extremely difficult because the soil is on the lowest part of the landscape and receives surface water from all adjacent areas.

This soil is generally unsuitable for trees because of the flooding and the ponding. Large dead trees and stumps indicate that trees once grew on this soil but could not withstand the wet conditions.

This soil is well suited to habitat for wetland wildlife, such as ducks, geese, herons, rails, kingfishers, muskrat, mink, and beaver. It is well suited to the plants that provide food or cover for wetland wildlife. Examples are smartweed, rushes, sedges, reeds, and cattail. Some domestic grasses and herbaceous legumes can be grown for wildlife cover and food. The many shallow water areas are used extensively by wetland wildlife.

Because of the ponding and the flooding, this soil is generally unsuitable as a site for dwellings and septic tank absorption fields. It is severely limited as a site for local roads because of the flooding, the ponding, and low strength. Constructing the roads on raised, well compacted fill material and providing adequate roadside ditches and culverts help to prevent the damage caused by flooding and ponding. Providing a more stable base material, such as sand and gravel, improves the ability of the roads to support vehicular traffic.

The land capability classification is VIIIw. No woodland ordination symbol is assigned.

Cg—Chagrin silt loam, frequently flooded. This nearly level, deep, well drained soil is on bottom land. It is frequently flooded during winter and early spring. Areas are generally long and narrow and are 3 to 70 acres in size. The dominant size is about 10 acres.

Typically, the surface layer is dark grayish brown silt loam about 6 inches thick. The subsoil is about 40 inches thick. It is dark yellowish brown, friable silt loam in the upper part; yellowish brown, friable loam in the next part; and dark yellowish brown, very friable sandy loam in the lower part. The underlying material to a depth of about 60 inches is dark yellowish brown sand. In places the surface layer is loam or silty clay loam.

Included with this soil in mapping are the well drained Haymond, Nolin, and Wirt soils. These soils have less sand and more silt in the control section than the Chagrin soil. Also included are the somewhat excessively drained Moundhaven soils, which have more sand than the Chagrin soil. All of the included soils are in landscape positions similar to those of the Chagrin soil. They make up about 15 percent of the map unit.

The Chagrin soil has a high available water capacity. Permeability is moderate. The organic matter content is moderate in the surface layer. Runoff is medium. The water table is at a depth of 4 to 6 feet during winter and early spring.

Most areas of this soil are used for cultivated crops. Some are wooded, and a few are used for hay and pasture.

This soil is well suited to corn and soybeans. The flooding is the main hazard. It generally does not occur during the cropping season and only occasionally causes crop damage. Levees can control the flooding, but they are extremely expensive if they are constructed to provide total protection. Cover crops and crop residue management improve tilth and increase the organic matter content. The soil is well suited to spring plowing, spring chiseling, and a no-till cropping system.

This soil is well suited to grasses and legumes for hay and pasture. The flooding is the main hazard. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. Plant competition is severe. It can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the flooding, this soil is generally unsuitable as a site for dwellings and septic tank absorption fields and is severely limited as a site for local roads. Constructing the roads on raised, well compacted fill material and providing adequate roadside ditches and culverts help to prevent the damage caused by flooding.

The land capability classification is IIw. The woodland ordination symbol is 5A.

Cr—Crawleyville loam. This nearly level, deep, somewhat poorly drained soil is on river terraces. Areas are irregular in shape and are 3 to more than 200 acres in size. The dominant size is about 10 acres.

Typically, the surface layer is dark grayish brown loam about 9 inches thick. The subsurface layer is about 3 inches of brown, mottled loam. The subsoil is about 38 inches thick. It is mottled and friable. In sequence downward, it is yellowish brown sandy clay loam, light brownish gray sandy clay loam, light brownish gray fine sandy loam, and light gray fine sandy loam. The underlying material to a depth of about 60 inches is light gray, mottled fine sandy loam. In some areas the soil is gravelly throughout.

Included with this soil in mapping are the well drained Skelton soils in the slightly higher landscape positions and the poorly drained Vincennes soils in the slightly lower positions. Included soils make up about 5 percent of the map unit.

The Crawleyville soil has a high available water capacity. Permeability is moderate. The organic matter content is moderately low in the surface layer. Runoff is slow. The water table is at a depth of about 1 to 3 feet during winter and early spring.

Most areas of this soil are used for cultivated crops. Some are wooded, and a few are used for hay and pasture.

If drained, this soil is well suited to corn, soybeans, and winter wheat. The wetness is the main limitation. Subsurface drains, surface drains, and open ditches help to remove excess water. Cover crops and crop residue management help to maintain tilth and the organic matter content. The soil is well suited to fall chiseling and to a till-plant cropping system.

This soil is well suited to grasses and legumes for hay and pasture. It is better suited to grasses than to deep-rooted legumes because of the seasonal high water table. Examples of suitable grasses are orchardgrass and tall fescue, and examples of suitable legumes are ladino clover and red clover. A drainage system is needed. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. Plant competition is moderate. It can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the wetness, this soil is severely limited as a site for dwellings. A foundation drainage system lowers the water table. Constructing the buildings on raised, well compacted fill material increases the depth to the water table.

Because of frost action, this soil is severely limited as a site for local roads and streets. Constructing the roads and streets on raised, well compacted fill material, strengthening or replacing the base with better suited material, and providing adequate roadside ditches and culverts minimize the damage caused by frost action.

Because of the wetness, this soil is severely limited as a site for septic tank absorption fields. Installing

interceptor drains around the absorption field lowers the water table. Alternative methods of sewage disposal should be considered. Public disposal systems generally are needed.

The land capability classification is IIw. The woodland ordination symbol is 4A.

Du—Dumps, mine. This map unit occurs as areas of mine spoil from abandoned shaft mines. The spoil is dominantly ashes, soil material, coal, sandstone, and shale fragments. Areas are 10 to 30 acres in size. Some are graded, and some are ungraded. Slopes range from 2 to 40 percent.

This map unit supports little or no vegetation in all areas, except for scattered small areas. Erosion and sedimentation are severe hazards. The soil material has a wide range in chemical and physical properties. As a result, onsite investigation is needed if alternative land uses are considered.

No land capability classification or woodland ordination symbol is assigned.

EkA—Elkinsville silt loam, 0 to 2 percent slopes. This nearly level, deep, well drained soil is on stream terraces. Areas are irregular in shape and are 3 to 20 acres in size. The dominant size is about 10 acres.

Typically, the surface layer is brown silt loam about 10 inches thick. The subsoil is friable silty clay loam about 64 inches thick. It is yellowish brown in the upper part and dark yellowish brown and mottled in the lower part. The underlying material to a depth of about 80 inches is yellowish brown, mottled, friable silty clay loam. In some places the soil is deeper to the underlying material. In other places the surface layer is darker. In a few areas the content of gravel in the underlying material is 10 to 30 percent. In some areas the slope is more than 2 percent.

Included with this soil in mapping are the somewhat poorly drained Crawleyville and poorly drained Vincennes soils in depressions. Also included are the well drained Skelton soils. These soils are more sandy than the Elkinsville soil. They are in landscape positions similar to those of the Elkinsville soil. Included soils make up about 10 percent of the map unit.

The Elkinsville soil has a high available water capacity. Permeability is moderate. The organic matter content is moderately low in the surface layer. Runoff is medium.

Most areas of this soil are used for cultivated crops. A few are used for hay and pasture or are wooded.

This soil is well suited to corn, soybeans, and small grain. Cover crops and a system of conservation tillage that leaves all or part of the crop residue on the surface help to maintain tilth and the organic matter content and improve the available water capacity. The soil is well suited to till-plant and no-till cropping systems.

This soil is well suited to grasses and legumes for hay and pasture. Examples of suitable grasses are orchardgrass, timothy, and tall fescue, and examples of suitable legumes are alfalfa and red clover. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. Plant competition is moderate. Seedlings survive and grow well if competing vegetation is controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the shrink-swell potential, this soil is moderately limited as a site for dwellings. Strengthening foundations, footings, and basement walls and backfilling with coarse textured material help to prevent the structural damage caused by shrinking and swelling. Because of frost action and low strength, the soil is severely limited as a site for local roads and streets. Constructing the roads and streets on raised, well compacted fill material, strengthening or replacing the base with better suited material, and providing adequate roadside ditches and culverts minimize the damage caused by frost action and low strength. The soil is suitable as a site for septic tank absorption fields.

The land capability classification is I. The woodland ordination symbol is 5A.

EkB—Elkinsville silt loam, 2 to 6 percent slopes. This gently sloping, deep, well drained soil is on stream terraces. Areas are irregular in shape and are 3 to 20 acres in size. The dominant size is about 10 acres.

Typically, the surface layer is brown silt loam about 7 inches thick. The subsurface layer also is brown silt loam. It is about 6 inches thick. The subsoil is yellowish brown, friable silt loam about 40 inches thick. It is mottled in the lower part. The underlying material to a depth of about 80 inches is yellowish brown, mottled silt loam. In places the soil is deeper to the underlying material. In a few areas the surface layer is darker. In some areas the content of gravel in the underlying material is 10 to 30 percent. In other areas the slope is less than 2 and more than 6 percent.

Included with this soil in mapping are severely eroded soils. Also included are somewhat poorly drained soils that have low-chroma mottles in the upper part of the subsoil. Included soils make up about 10 percent of the map unit.

The Elkinsville soil has a high available water capacity. Permeability is moderate. The organic matter content is moderately low in the surface layer. Runoff is medium.

Most areas of this soil are used for cultivated crops. A few are used for hay and pasture or are wooded.

This soil is well suited to corn, soybeans, and small grain. Water erosion is the main hazard. It can be controlled by terraces, diversions, a system of conservation tillage that leaves all or part of the crop residue on the surface, a crop rotation that includes

grasses and legumes, grassed waterways, and grade stabilization structures. The soil is well suited to till-plant and no-till cropping systems. Conservation tillage and cover crops improve tilth and increase the organic matter content and the available water capacity.

This soil is well suited to grasses and legumes for hay and pasture. Examples of suitable grasses are orchardgrass and tall fescue, and examples of suitable legumes are alfalfa and red clover. Water erosion is the main hazard. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to control water erosion and keep the pasture in good condition.

This soil is well suited to trees. Plant competition is moderate. Seedlings survive and grow well if competing vegetation is controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the shrink-swell potential, this soil is moderately limited as a site for dwellings. Strengthening foundations, footings, and basement walls and backfilling with coarse textured material help to prevent the structural damage caused by shrinking and swelling. Because of frost action and low strength, the soil is severely limited as a site for local roads and streets. Constructing the roads and streets on raised, well compacted fill material, strengthening or replacing the base with better suited material, and providing adequate roadside ditches and culverts minimize the damage caused by frost action and low strength. The soil is suitable as a site for septic tank absorption fields.

The land capability classification is IIe. The woodland ordination symbol is 5A.

Ev—Evansville silt loam. This nearly level, deep, poorly drained soil is on lacustrine plains. It is subject to ponding. Areas are irregular in shape and are 5 to 400 acres in size. The dominant size is about 100 acres.

Typically, the surface layer is dark grayish brown silt loam about 9 inches thick. The subsurface layer is about 9 inches of dark grayish brown, mottled silt loam. The subsoil is mottled, friable silt loam about 22 inches thick. It is gray in the upper part and dark gray in the lower part. The underlying material to a depth of about 65 inches is grayish brown and light brownish gray, mottled silt loam. In some places lighter colored overwash is on the surface. In other places the subsoil has more clay.

Included with this soil in mapping are the very poorly drained Ragsdale and somewhat poorly drained Reesville soils. Ragsdale soils are in landscape positions similar to those of the Evansville soil. Reesville soils are in the slightly higher positions. Also included are spots of sand, areas of silty material along drainage ditches, and areas that are ponded only during part of the growing season. Included soils make up about 5 percent of the map unit.

The Evansville soil has a high available water capacity. Permeability is moderate. The organic matter content is moderate in the surface layer. Runoff is slow. The water table is above or near the surface during winter and early spring.

Most areas of this soil are used for cultivated crops. Some are used for hay and pasture, and a few are wooded.

If drained, this soil is well suited to corn, soybeans, and small grain. The ponding is the main hazard. Subsurface drains, surface drains, and open ditches help to remove excess water. Cover crops and crop residue management improve tilth and increase the organic matter content. The soil is well suited to fall chiseling and to till-plant and ridge-plant cropping systems.

This soil is well suited to grasses and legumes for hay and pasture. It is better suited to grasses than to deep-rooted legumes because of the seasonal high water table. Examples of suitable grasses are reed canarygrass and tall fescue, and an example of a suitable legume is ladino clover. The ponding is the main hazard. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. The equipment limitation, seedling mortality, the windthrow hazard, and plant competition are management concerns. Equipment should be used only during dry periods or when the ground is frozen. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling. The species that can withstand the wetness should be selected for planting. Some replanting may be necessary. Protective borders or windbreaks on the windward side of the wooded tracts help to prevent windthrow. Windthrown trees should be removed periodically.

Because of the ponding, this soil is generally unsuitable as a site for dwellings and sanitary facilities. It is severely limited as a site for local roads because of the ponding, low strength, and frost action. Constructing the roads on raised, well compacted fill material, strengthening or replacing the base with better suited material, and providing adequate roadside ditches and culverts minimize the damage caused by ponding, low strength, and frost action.

The land capability classification is IIw. The woodland ordination symbol is 5W.

FaG—Fairpoint shaly silt loam, 15 to 60 percent slopes. This strongly sloping to very steep, deep, well drained soil is in areas of ungraded mine spoil on uplands. Areas are generally rectangular and are 40 to 500 acres in size. The dominant size is about 100 acres.

Typically, the surface layer is dark grayish brown shaly silt loam about 5 inches thick. The underlying material to

a depth of about 60 inches is dark grayish brown, friable extremely shaly silt loam. In many places permeability is moderate or moderately rapid. In some areas the underlying material is more acid.

Included with this soil in mapping are the well drained Gudgel soils and the well drained and moderately well drained Hosmer soils. Both of these soils have a fragipan. Also included are soils that have sandstone boulders on the surface, small pits that are subject to ponding, and gullied areas. Included soils make up about 5 percent of the map unit.

The Fairpoint soil has a low available water capacity. Permeability is moderately slow. The organic matter content is very low in the surface layer. Runoff is very rapid.

Most areas have been planted to pine. A few are used as wildlife habitat. This soil is generally unsuitable for cultivated crops, hay, and pasture because of the slope, the low available water capacity, and the content of coarse fragments.

This soil is poorly suited to woodland. The erosion hazard, the equipment limitation, and seedling mortality are the main management concerns. Logging roads and skid trails should be built in the less sloping areas. Clearcutting should be avoided. Special logging equipment may be needed. Planting containerized stock reduces the seedling mortality rate. Some replanting may be necessary.

Because of the slope and the unstable fill, this soil is generally unsuitable as a site for dwellings and sanitary facilities and is severely limited as a site for local roads. The roads should be built on the contour. Land shaping may be needed. Strengthening or replacing the base with better suited material improves the ability of the roads to support vehicular traffic.

The land capability classification is VIIe. The woodland ordination symbol 1S.

GnF—Gilpin Variant silt loam, 18 to 50 percent slopes. This moderately steep to very steep, moderately deep, well drained soil is on side slopes in the uplands. Areas are irregular in shape and are 3 to 25 acres in size. The dominant size is about 8 acres.

Typically, the surface layer is very dark gray silt loam about 3 inches thick. The subsurface layer is about 5 inches of brown silt loam. The subsoil is about 26 inches of yellowish brown, friable silt loam and loam. Soft, weathered sandstone and shale bedrock is at a depth of about 34 inches. In places the slope is less than 18 or more than 50 percent.

Included with this soil in mapping are the well drained, deep Alford and Taftown soils on the upper part of the slopes. Also included are severely eroded areas, rock outcrops, gullies, and narrow areas of alluvial soils along drainageways. Included areas make up about 8 percent of the map unit.

The Gilpin Variant soil has a low available water capacity. Permeability is moderate. The organic matter content is moderate in the surface layer. Runoff is very rapid.

Most areas are used as woodland. Because of the slope and a severe hazard of water erosion, this soil is generally unsuitable as cropland and hayland and is poorly suited to grasses and legumes for pasture. Examples of suitable grasses are timothy, orchardgrass, and tall fescue, and examples of suitable legumes are alfalfa, red clover, and lespedeza. Special management is needed to establish and maintain stands of desirable grasses and legumes. Proper stocking rates, timely deferment of grazing, and pasture rotation help to control water erosion and keep the pasture in good condition.

This soil is fairly well suited to trees. The erosion hazard, the equipment limitation, and plant competition are the main management concerns. Logging roads and skid trails should be built on the gentler slopes or on the contour. Special harvesting equipment may be needed. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the slope, this soil is generally unsuitable as a site for dwellings, local roads and streets, and sanitary facilities. The slope limits the use of construction equipment.

The land capability classification is VIIe. The woodland ordination symbol is 4R.

GuC3—Gudgel silt loam, 6 to 12 percent slopes, severely eroded. This moderately sloping, deep, moderately well drained soil is on side slopes in the uplands. Areas are irregular in shape and are 5 to 20 acres in size. The dominant size is about 10 acres.

Typically, the surface layer is mixed yellowish brown and brown silt loam about 7 inches thick. In most areas, nearly all of the original darkened surface layer has been removed by water erosion and tillage has mixed the rest with the upper part of the subsoil. The subsoil is about 57 inches thick. It is yellowish brown, friable silt loam in the upper part; a fragipan of yellowish brown, mottled, very firm silt loam in the next part; and strong brown, mottled, firm silty clay loam in the lower part. Soft, weathered shale is at a depth of about 64 inches. In some places the slope is more than 12 or less than 6 percent. In other places the soil is shallower to residuum.

Included with this soil in mapping are areas of the well drained Taftown soils on the lower side slopes. These soils do not have a fragipan. Also included are uneroded areas. Included soils make up about 8 percent of the map unit.

The Gudgel soil has a moderate available water capacity. Permeability is moderate above the fragipan and slow in the fragipan. The organic matter content is low in the surface layer. Runoff is rapid. A perched water

table is at a depth of 1 to 2 feet in late winter and in spring.

Most areas of this soil are used for cultivated crops. Some are used for hay and pasture. A few are wooded.

This soil is poorly suited to corn, soybeans, and winter wheat. Water erosion is the main hazard. It can be controlled by a crop rotation that includes grasses and legumes and by terraces, grassed waterways, a system of conservation tillage that leaves all or part of the crop residue on the surface, grade stabilization structures, and cover crops. More than one of these measures may be needed. The soil is well suited to till-plant and no-till cropping systems. Crop residue management and cover crops help to maintain soil structure, the organic matter content, and tilth.

This soil is well suited to grasses and legumes for hay and is fairly well suited to pasture. Examples of suitable grasses are orchardgrass, timothy, and tall fescue, and examples of suitable legumes are alfalfa and red clover. Water erosion is the main hazard. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to control water erosion and keep the pasture in good condition.

A few areas support native hardwoods. This soil is well suited to trees. Seedling mortality, the windthrow hazard, and plant competition are the main management concerns. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling. Special site preparation, such as furrowing before planting, reduces the seedling mortality rate. Some replanting may be necessary. Harvest methods that do not isolate the remaining trees or leave them widely spaced reduce the windthrow hazard. Windthrown trees should be periodically removed.

Because of the wetness, this soil is severely limited as a site for dwellings. A combination of storm sewers and a properly designed drainage system can lower the water table. Footing drains and sump pumps may be needed. Properly sealing the walls and backfilling around the footing drains with sand reduce the wetness on sites for dwellings with basements.

This soil is severely limited as a site for local roads and streets because of frost action and low strength. Properly designed roadside ditches and culverts and a more stable base material, such as sand or gravel, help to overcome these limitations.

Because of the wetness, this soil is severely limited as a site for septic tank absorption fields. Alternative methods of sewage disposal should be considered. Public disposal systems are generally needed.

The land capability classification is IVe. The woodland ordination symbol is 5D.

GuD3—Gudgel silt loam, 12 to 18 percent slopes, severely eroded. This strongly sloping, deep, moderately well drained soil is on side slopes in the uplands. Areas are irregular in shape and are 5 to 20 acres in size. The dominant size is about 10 acres.

Typically, the surface layer is yellowish brown silt loam about 6 inches thick. In most areas, nearly all of the original darkened surface layer has been removed by water erosion and tillage has mixed the rest with the upper part of the subsoil. The subsoil is about 45 inches thick. It is yellowish brown, friable silt loam in the upper part; a fragipan of yellowish brown, mottled, very firm silt loam in the next part; and dark yellowish brown, mottled, firm silty clay loam in the lower part. Soft, weathered shale and sandstone bedrock is at a depth of about 51 inches. In places the slope is more than 18 or less than 12 percent. In some areas the soil has no fragipan and is shallower to residuum.

Included with this soil in mapping are the well drained Taftown soils on the lower side slopes. These soils do not have a fragipan. Also included are uneroded areas. Included soils make up about 8 percent of the map unit.

The Gudgel soil has a moderate available water capacity. Permeability is moderate above the fragipan and slow in the fragipan. The organic matter content is low in the surface layer. Runoff is very rapid. A perched water table is at a depth of 1 to 2 feet in late winter and in spring.

Most areas are used for cultivated crops. Some are used for hay and pasture, and a few are wooded. Because of the hazard of water erosion, this soil is generally unsuitable as cropland, is poorly suited to grasses and legumes for hay, and is only fairly well suited to pasture. Examples of suitable grasses are orchardgrass, timothy, and tall fescue, and examples of suitable legumes are alfalfa and red clover. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to control water erosion and keep the pasture in good condition.

This soil is well suited to trees. Plant competition, the windthrow hazard, and seedling mortality are the main management concerns. Logging roads and skid trails should be built on the gentler slopes or on the contour. Special site preparation, such as furrowing before planting, reduces the seedling mortality rate. Some replanting may be necessary. Harvest methods that do not isolate the remaining trees or leave them widely spaced reduce the windthrow hazard. Windthrown trees should be periodically removed. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the slope and the wetness, this soil is severely limited as a site for dwellings. A combination of storm sewers and a properly designed drainage system can lower the water table. Footing drains and sump pumps may be needed. Properly sealing the walls and backfilling around the footing drains with sand reduce

the wetness on sites for dwellings with basements. The slope should be modified by grading, or the buildings should be designed so that they conform to the natural slope of the land. Retaining as much of the existing vegetation as possible during construction and revegetating disturbed areas as soon as possible help to control erosion.

Because of the slope, frost action, and low strength, this soil is severely limited as a site for local roads and streets. Replacing or covering the upper soil layer with suitable base material helps to prevent the damage caused by frost action and low strength. Constructing the roads and streets on the contour and land shaping help to overcome the slope.

Because of the slope, the wetness, and the slow permeability, this soil is severely limited as a site for septic tank absorption fields. Installing the absorption field on the contour helps to overcome the slope. Installing interceptor drains around the absorption field lowers the water table. Enlarging the absorption field helps to compensate for the restricted permeability. Alternative methods of sewage disposal should be considered. Public disposal systems generally are needed.

The land capability classification is VIe. The woodland ordination symbol is 5D.

Hd—Haymond silt loam, frequently flooded. This nearly level, deep, well drained soil is on bottom land. It is frequently flooded during winter and early spring. Areas generally are long and narrow and are 3 to 80 acres in size. The dominant size is about 15 acres.

Typically, the surface layer is brown silt loam about 8 inches thick. The subsoil is about 37 inches of dark yellowish brown, friable silt loam. The underlying material to a depth of about 60 inches is dark yellowish brown silt loam. In some places the soil has more sand. In other places it is mildly alkaline to a depth of 60 inches.

Included with this soil in mapping are the somewhat poorly drained Newark and Wakeland soils in drainageways and old channels, the moderately well drained Lindside and Wilbur soils in the lower landscape positions, and the well drained Nolin soils in the slightly lower positions. Nolin soils are less silty than the Haymond soil. Also included are areas along old channels where the slope is 2 to 18 percent and areas where the soil has 10 to 20 inches of sandy overwash. Included soils make up about 15 percent of the map unit.

The Haymond soil has a very high available water capacity. Permeability is moderate. The organic matter content is moderately low in the surface layer. Runoff is slow.

Most areas of this soil are used for cultivated crops. Some are used as woodland or pasture.

This soil is well suited to corn and soybeans. The flooding is the main hazard. It occasionally causes some crop loss. It can be controlled by levees. The soil is well suited to spring plowing, spring chiseling, and a no-till cropping system.

This soil is well suited to grasses and legumes for hay and pasture. Examples of suitable grasses are orchardgrass and tall fescue, and examples of suitable legumes are ladino clover and red clover. The flooding is the main hazard. Overgrazing or grazing during wet periods results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. Plant competition is moderate. Seedlings grow well if competing vegetation is controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the flooding, this soil is generally unsuitable as a site for dwellings and septic tank absorption fields. It is severely limited as a site for local roads because of the flooding and frost action. Constructing the roads on raised, well compacted fill material, strengthening or replacing the base with better suited material, and providing adequate roadside ditches and culverts minimize the damage caused by floodwater and frost action.

The land capability classification is IIw. The woodland ordination symbol is 8A.

HhA—Henshaw Variant silt loam, 0 to 2 percent slopes, frequently flooded. This nearly level, somewhat poorly drained soil is on low stream terraces. It is frequently flooded during winter and early spring. Areas are irregular in shape and are 3 to more than 30 acres in size. The dominant size is about 15 acres.

Typically, the surface layer is brown silt loam about 7 inches thick. The subsoil is about 33 inches thick. It is yellowish brown, mottled, firm silt loam in the upper part and yellowish brown and grayish brown, mottled, firm and friable silty clay loam in the lower part. The underlying material to a depth of about 60 inches is light brownish gray, mottled silt loam. In a few places strata of sand or loamy sand are below a depth of 60 inches.

Included with this soil in mapping are the poorly drained Petrolia soils in depressions. Also included are soils that have a dense layer in the subsoil. Included soils make up about 10 percent of the map unit.

The Henshaw Variant soil has a very high available water capacity. Permeability is moderately slow. The organic matter content is moderately low in the surface layer. Runoff is slow. The water table is at a depth of 1 to 2 feet during winter and early spring.

Most areas of this soil are used for cultivated crops. Some are wooded, and a few are used for hay and pasture.

This soil is well suited to corn, soybeans, and winter wheat. The wetness is the main limitation, and the flooding is the main hazard. Subsurface drains, surface drains, and open ditches help to remove excess water.

The flooding usually does not occur during the cropping season and only occasionally damages the crops. Levees can control the flooding, but they are extremely expensive if they are constructed to provide total protection. Cover crops and crop residue management improve tilth and increase the organic matter content. The soil is well suited to a ridge-plant cropping system.

This soil is well suited to grasses and legumes for hay and pasture. It is better suited to grasses than to deep-rooted legumes because of the seasonal high water table. Examples of suitable grasses are orchardgrass and tall fescue, and an example of a suitable legume is ladino clover. The flooding is the main hazard. A drainage system is needed. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. Plant competition and the equipment limitation are the main management concerns. Equipment should not be used during wet periods. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the flooding, this soil is generally unsuitable as a site for dwellings and septic tank absorption fields. It is severely limited as a site for local roads because of the flooding, low strength, and frost action. Constructing the roads on raised, well compacted fill material, strengthening or replacing the base with better suited material, and providing adequate roadside ditches and culverts minimize the damage caused by floodwater, low strength, and frost action.

The land capability classification is IIw. The woodland ordination symbol is 5W.

HoB2—Hosmer silt loam, 2 to 6 percent slopes, eroded. This gently sloping, deep, well drained and moderately well drained soil is in the uplands. Areas are irregular in shape and are 13 to 300 acres in size. The dominant size is about 100 acres.

Typically, the surface layer is mixed brown and yellowish brown silt loam about 8 inches thick. The upper 15 inches of the subsoil is yellowish brown, friable silt loam. The lower part to a depth of about 80 inches is a fragipan of strong brown, firm silty clay loam and dark yellowish brown, mottled, very firm silt loam. In some places residuum is within a depth of 60 inches. In other places the slope is less than 2 or more than 6 percent.

Included with this soil in mapping are the well drained Alford and moderately well drained Muren soils. These soils are in landscape positions similar to those of the Hosmer soil. They do not have a fragipan. Also included are severely eroded areas. Included soils make up about 10 percent of the map unit.

The Hosmer soil has a moderate available water capacity. Permeability is moderate above the fragipan and very slow in the fragipan. The organic matter content is moderately low in the surface layer. Runoff is medium. A perched water table is at a depth of about 2.5 to 3.0 feet during late winter and early spring.

Most areas of this soil are used for cultivated crops. Some are wooded, and a few are used for hay and pasture.

This soil is well suited to corn, soybeans, and winter wheat. Water erosion is the main hazard. It can be controlled by a crop rotation that includes grasses and legumes and by terraces, water- and sediment-control basins, grassed waterways, a system of conservation tillage that leaves all or part of the crop residue on the surface, grade stabilization structures, and cover crops. The soil is well suited to till-plant and no-till cropping systems. Crop residue management and cover crops help to maintain soil structure, increase the organic matter content, and improve tilth.

This soil is well suited to grasses and legumes for hay and pasture. Examples of suitable grasses are orchardgrass, timothy, and tall fescue, and examples of suitable legumes are alfalfa and red clover. Water erosion is the main hazard. Overgazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to control water erosion and keep the pasture in good condition.

This soil is well suited to trees. Plant competition is moderate. It can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the wetness, this soil is moderately limited as a site for dwellings with basements. It is moderately limited as a site for dwellings without basements because of the shrink-swell potential. Subsurface drains help to lower the water table. Footing drains and sump pumps may be needed. Properly sealing the walls and backfilling around the footing drains with sand reduce the wetness on sites for dwellings with basements. Installing expansion joints helps to prevent the structural damage caused by shrinking and swelling.

Because of frost action, this soil is severely limited as a site for local roads and streets. Properly designed roadside ditches and culverts and a more stable base material, such as sand or gravel, help to prevent the damage caused by frost action.

Because of the wetness and the very slow permeability in the fragipan, this soil is severely limited as a site for septic tank absorption fields. Perimeter drains are needed. Providing suitable fill material improves the ability of the field to absorb the effluent. Alternative methods of sewage disposal should be considered. Public disposal systems generally are needed.

The land capability classification is IIe. The woodland ordination symbol is 4A.

HoB3—Hosmer silt loam, 2 to 6 percent slopes, severely eroded. This deep, gently sloping, well drained and moderately well drained soil is on ridgetops and benches in the uplands. Areas are irregular in shape and are 5 to 20 acres in size. The dominant size is about 10 acres.

Typically, the surface layer is mixed dark yellowish brown and brown silt loam about 4 inches thick. In most areas, nearly all of the original darkened surface layer has been removed by erosion and tillage has mixed the rest with the upper part of the subsoil. The upper 19 inches of the subsoil is yellowish brown, friable silt loam. The next 41 inches is a fragipan of yellowish brown, mottled, firm silt loam and light brownish gray, mottled, very firm silt loam. The lower part to a depth of about 80 inches is dark yellowish brown, mottled, friable silt loam. In some places the slope is more than 6 percent. In other places residuum is within a depth of 60 inches.

Included with this soil in mapping are the well drained Alford and moderately well drained Muren soils. These soils are in landscape positions similar to those of the Hosmer soil. They do not have a fragipan. They make up about 10 percent of the map unit.

The Hosmer soil has a moderate available water capacity. Permeability is moderate above the fragipan and very slow in the fragipan. The organic matter content is low in the surface layer. Runoff is medium. A perched water table is at a depth of about 2.5 to 3.0 feet during late winter and early spring.

Most areas of this soil are used for cultivated crops. A few are used as hayland, pasture, or woodland.

This soil is fairly well suited to corn, soybeans, and winter wheat. Water erosion is the main hazard. It can be controlled by a crop rotation that includes grasses and legumes and by grassed waterways, a system of conservation tillage that leaves all or part of the crop residue on the surface, grade stabilization structures, and cover crops. The soil is well suited to till-plant and no-till cropping systems. Crop residue management and cover crops help to maintain soil structure, increase the organic matter content, and improve tilth.

This soil is well suited to grasses and legumes for hay and pasture. Examples of suitable grasses are orchardgrass, timothy, and tall fescue, and examples of suitable legumes are alfalfa and red clover. Water erosion is the main hazard. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to control water erosion and keep the pasture in good condition.

This soil is well suited to trees. Plant competition is moderate. It can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the wetness, this soil is moderately limited as a site for dwellings with basements. It is moderately limited as a site for dwellings without basements because of the shrink-swell potential. Subsurface drains help to lower the water table. Footing drains and sump pumps may be needed. Adequate drainage outlets are not available in all areas. Properly sealing the walls and backfilling around the footing drains with sand reduce the wetness on sites for dwellings with basements. Installing expansion joints helps to prevent the structural damage caused by shrinking and swelling.

Because of frost action, this soil is severely limited as a site for local roads and streets. Properly designed roadside ditches and culverts and a more stable base material, such as sand or gravel, help to prevent the damage caused by frost action.

Because of the wetness and the very slow permeability in the fragipan, this soil is severely limited as a site for septic tank absorption fields. Perimeter drains are needed. Providing suitable fill material improves the ability of the field to absorb the effluent. Alternative methods of sewage disposal should be considered. Public disposal systems generally are needed.

The land capability classification is IIIe. The woodland ordination symbol is 4A.

HoC—Hosmer silt loam, 6 to 12 percent slopes. This moderately sloping, deep, well drained and moderately well drained soil is on side slopes and secondary ridgetops in the uplands. Areas are irregular in shape and are 5 to 20 acres in size. The dominant size is about 10 acres.

Typically, the surface layer is brown silt loam about 4 inches thick. The subsurface layer is about 4 inches of yellowish brown silt loam. The subsoil extends to a depth of about 80 inches. It is mottled. It is yellowish brown, friable silt loam in the upper part; a fragipan of yellowish brown, firm and very firm silt loam in the next part; and light brownish gray, firm silty clay loam in the lower part. In places the slope is more than 12 or less than 6 percent.

Included with this soil in mapping are the well drained Alford soils on side slopes and secondary ridgetops. These soils do not have a fragipan. Also included are severely eroded areas. Included soils make up about 8 percent of the map unit.

The Hosmer soil has a moderate available water capacity. Permeability is moderate above the fragipan and very slow in the fragipan. The organic matter content is moderately low in the surface layer. Runoff is rapid. A perched water table is at a depth of 2.5 to 3.0 feet during late winter and early spring.

Most areas of this soil are used as woodland. Some are used for hay and pasture, and a few are used for cultivated crops.

This soil is fairly well suited to corn, soybeans, and winter wheat. Water erosion is the main hazard. It can be controlled by a crop rotation that includes grasses and legumes and by terraces, grassed waterways, a system

of conservation tillage that leaves all or part of the crop residue on the surface, grade stabilization structures, and cover crops. The soil is well suited to till-plant and no-till cropping systems. Crop residue management and cover crops help to maintain soil structure, increase the organic matter content, and improve tilth.

This soil is well suited to grasses and legumes for hay and pasture. Examples of suitable grasses are orchardgrass, timothy, and tall fescue, and examples of suitable legumes are alfalfa and red clover. Water erosion is the main hazard. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to control water erosion and keep the pasture in good condition.

This soil is well suited to trees. Plant competition is moderate. It can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the wetness and the slope, this soil is moderately limited as a site for dwellings with basements. It is moderately limited as a site for dwellings without basements because of the shrink-swell potential and the slope. Subsurface drains help to lower the water table. Footing drains and sump pumps may be needed. Properly sealing the walls and backfilling around the footing drains with sand reduce the wetness on sites for dwellings with basements. Strengthening foundations, footings, and basement walls and installing foundation drains and expansion joints help to prevent the structural damage caused by shrinking and swelling. The slope should be modified by grading, or the buildings should be designed so that they conform to the natural slope of the land. Retaining as much of the existing vegetation as possible during construction and revegetating disturbed areas as soon as possible help to control erosion.

Because of frost action, this soil is severely limited as a site for local roads and streets. Properly designed roadside ditches and culverts and a more stable base material, such as sand or gravel, help to prevent the damage caused by frost action.

Because of the wetness and the very slow permeability in the fragipan, this soil is severely limited as a site for septic tank absorption fields. Perimeter drains are needed. Providing suitable fill material improves the ability of the field to absorb the effluent. Alternative methods of sewage disposal should be considered. Public disposal systems generally are needed.

The land capability classification is IIIe. The woodland ordination symbol is 4A.

HoC3—Hosmer silt loam, 6 to 12 percent slopes, severely eroded. This moderately sloping, deep, well drained and moderately well drained soil is on side slopes and ridgetops in the uplands. Areas are irregular in shape and are 5 to 75 acres in size. The dominant size is about 20 acres.

Typically, the surface layer is yellowish brown silt loam about 7 inches thick. In most areas, nearly all of the original darkened surface layer has been removed by erosion and tillage has mixed the rest with the upper part of the subsoil. The subsoil extends to a depth of about 80 inches. It is yellowish brown and mottled. The upper part is friable silt loam, the next part is a fragipan of firm and very firm silt loam, and the lower part is firm silty clay loam. In places the slope is more than 12 or less than 6 percent.

Included with this soil in mapping are the well drained Alford soils on side slopes and secondary ridgetops. These soils do not have a fragipan. Also included are uneroded areas. Included soils make up about 8 percent of the map unit.

The Hosmer soil has a moderate available water capacity. Permeability is moderate above the fragipan and very slow in the fragipan. The organic matter content is low in the surface layer. Runoff is rapid. A perched water table is at a depth of about 2.5 to 3.0 feet during late winter and early spring.

Most areas of this soil are used for cultivated crops. Some are used for hay and pasture, and a few are wooded.

This soil is poorly suited to corn, soybeans, and winter wheat. Water erosion is the main hazard. It can be controlled by a crop rotation that includes grasses and legumes and by terraces, grassed waterways, a system of conservation tillage that leaves all or part of the crop residue on the surface, grade stabilization structures, and cover crops. Crop residue management and cover crops help to maintain soil structure, increase the organic matter content, and improve tilth.

This soil is well suited to grasses and legumes for hay and pasture. Examples of suitable grasses are orchardgrass, timothy, and tall fescue, and examples of suitable legumes are alfalfa and red clover. Water erosion is the main hazard. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to control water erosion and keep the pasture in good condition.

This soil is well suited to trees. Plant competition is moderate. It can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the wetness and the slope, this soil is moderately limited as a site for dwellings with basements. It is moderately limited as a site for dwellings without basements because of the shrink-swell potential and the slope. Subsurface drains help to lower the water table. Footing drains and sump pumps may be needed. Properly sealing the walls and backfilling around the footing drains and basement walls with sand and gravel help to prevent the structural damage caused by

wetness and by shrinking and swelling. Strengthening foundations, footings, and basement walls and installing foundation drains and expansion joints help to prevent the damage caused by shrinking and swelling. The slope should be modified by grading, or the buildings should be designed so that they conform to the natural slope of the land. Retaining as much of the existing vegetation as possible during construction and revegetating disturbed areas as soon as possible help to control erosion.

Because of frost action, this soil is severely limited as a site for local roads and streets. Properly designed roadside ditches and culverts and a more stable base material, such as sand or gravel, help to prevent the damage caused by frost action.

Because of the wetness and the very slow permeability in the fragipan, this soil is severely limited as a site for septic tank absorption fields. Perimeter drains are needed. Providing suitable fill material improves the ability of the field to absorb the effluent. Alternative methods of sewage disposal should be considered. Public disposal systems generally are needed.

The land capability classification is IVe. The woodland ordination symbol is 4A.

IvA—Iva silt loam, 0 to 2 percent slopes. This nearly level, deep, somewhat poorly drained soil is on stream terraces. Areas are irregular in shape and are 3 to more than 50 acres in size. The dominant size is about 15 acres.

Typically, the surface layer is brown silt loam about 11 inches thick. The subsurface layer is about 7 inches of brown, mottled silt loam. The subsoil is about 31 inches thick. It is yellowish brown and mottled. The upper part is friable silt loam, the next part is firm silty clay loam, and the lower part is firm silt loam. The underlying material to a depth of about 60 inches is yellowish brown, mottled silt loam. In places the subsoil is less acid.

Included with this soil in mapping are the poorly drained Peoga soils in the slightly lower landscape positions. Also included are the well drained and moderately well drained Hosmer soils in the slightly higher positions. Included soils make up about 8 percent of the map unit.

The Iva soil has a very high available water capacity. Permeability is moderate. The organic matter content is moderate in the surface layer. Runoff is slow. The water table is at a depth of about 1 to 3 feet during winter and early spring.

Most areas of this soil are used for cultivated crops. Some are wooded, and a few are used for hay and pasture.

If drained, this soil is well suited to corn, soybeans, and winter wheat. The wetness is the main limitation. Subsurface drains, surface drains, and open ditches help to remove excess water. Cover crops and crop residue management improve tilth and increase the organic matter content. The soil is well suited to fall chiseling and to a till-plant cropping system.

This soil is well suited to grasses and legumes for hay and pasture. It is better suited to grasses than to deep-rooted legumes because of the seasonal high water table. Examples of suitable grasses are orchardgrass and tall fescue, and examples of suitable legumes are ladino clover and red clover. A drainage system is needed. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. The equipment limitation and plant competition are the main management concerns. Equipment should be used only during dry periods or when the ground is frozen. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the wetness, this soil is severely limited as a site for dwellings. Subsurface drains help to lower the water table. Footing drains and sump pumps may be needed. Because of frost action and low strength, the soil is severely limited as a site for local roads and streets. Properly designed roadside ditches and culverts and a more stable base material, such as sand or gravel, help to overcome these limitations.

Because of the wetness, this soil is severely limited as a site for septic tank absorption fields. Installing interceptor drains around the absorption field lowers the water table. Alternative methods of sewage disposal should be considered. Public disposal systems generally are needed.

The land capability classification is IIw. The woodland ordination symbol is 4W.

IvB—Iva silt loam, 2 to 4 percent slopes. This gently sloping, deep, somewhat poorly drained soil is on stream terraces. Areas are irregular in shape and are 3 to 30 acres in size. The dominant size is about 5 acres.

Typically, the surface layer is brown silt loam about 10 inches thick. The subsurface layer is about 7 inches of yellowish brown silt loam. The subsoil is about 35 inches thick. It is mottled. It is yellowish brown, friable silt loam in the upper part; gray, firm silty clay loam in the next part; and light brownish gray, friable silt loam in the lower part. The underlying material to a depth of about 60 inches is light brownish gray, mottled silt loam. In places the subsoil is less acid.

Included with this soil in mapping are the well drained and moderately well drained Hosmer soils in the slightly higher landscape positions. Also included are the poorly drained Peoga soils in the slightly lower positions. Included soils make up about 6 percent of the map unit.

The Iva soil has a very high available water capacity. Permeability is moderate. The organic matter content is moderate in the surface layer. Runoff is medium. The

water table is at a depth of 1 to 3 feet during winter and early spring.

Most areas of this soil are used for cultivated crops. Some are wooded, and a few are used for hay and pasture.

This soil is well suited to corn, soybeans, and winter wheat. Water erosion is the main hazard. It can be controlled by a system of conservation tillage that leaves all or part of the crop residue on the surface. The soil is well suited to fall chiseling and to a till-plant cropping system. Subsurface drains, surface drains, and open ditches help to remove excess water. Cover crops and crop residue management improve tilth and increase the organic matter content.

This soil is well suited to grasses and legumes for hay and pasture. It is better suited to grasses than to deep-rooted legumes because of the seasonal high water table. Examples of suitable grasses are orchardgrass and tall fescue, and examples of suitable legumes are ladino clover and red clover. Water erosion is the main hazard. A drainage system is needed. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to control water erosion and keep the pasture in good condition.

This soil is well suited to trees. The equipment limitation and plant competition are the main management concerns. Equipment should be used only during dry periods or when the ground is frozen. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the wetness, this soil is severely limited as a site for dwellings. Subsurface drains help to lower the water table. Footing drains and sump pumps may be needed. Properly sealing the walls and backfilling around the footing drains with sand reduce the wetness on sites for dwellings without basements.

Because of low strength and frost action, this soil is severely limited as a site for local roads and streets. Properly designed roadside ditches and culverts and a more stable base material, such as sand or gravel, help to overcome these limitations.

Because of the wetness, this soil is severely limited as a site for septic tank absorption fields. Installing interceptor drains around the absorption field lowers the water table. Alternative methods of sewage disposal should be considered. Public disposal systems generally are needed.

The land capability classification is IIe. The woodland ordination symbol is 4W.

Ju—Junius Variant loamy sand. This nearly level, deep, poorly drained soil is in depressions on uplands. Areas are irregular in shape and are 5 to 30 acres in size. The dominant size is about 10 acres.

Typically, the surface layer is dark grayish brown loamy sand about 8 inches thick. The subsurface layer is about 11 inches of light brownish gray, mottled loamy fine sand. The subsoil is light gray, mottled, friable sandy loam about 27 inches thick. The underlying material to a depth of about 80 inches is light gray, mottled fine sand. In some places the surface layer is loamy fine sand or fine sand. In other places it is light colored, sandy overwash. In a few areas the solum is loamy sand. In a few places the underlying material is stratified.

Included with this soil in mapping are the somewhat poorly drained Ayrshire Variant soils in the slightly higher landscape positions. Also included are the well drained Alvin and somewhat excessively drained Bloomfield soils in the higher positions. Included soils make up about 5 percent of the map unit.

The Junius Variant soil has a low available water capacity. Permeability is moderate. The organic matter content is moderate in the surface layer. Runoff is very slow. The water table is at a depth of 0.5 foot to 1.5 feet during winter and early spring.

Most areas of this soil are used for cultivated crops. Some are used for hay and pasture. A few are wooded.

If drained, this soil is well suited to corn, soybeans, and small grain. The wetness is the main limitation. Subsurface and surface drains help to remove excess water. Cover crops and crop residue management improve tilth and increase the organic matter content. The soil is well suited to a till-plant cropping system.

This soil is well suited to grasses, such as reed canarygrass and tall fescue, and legumes, such as ladino clover, for hay and pasture. It is better suited to grasses than to deep-rooted legumes because of the seasonal high water table. A drainage system is needed.

This soil is fairly well suited to trees. The equipment limitation, seedling mortality, the windthrow hazard, and plant competition are management concerns. Equipment should be used only during dry periods or when the ground is frozen. Special site preparation, such as bedding, increases the seedling survival rate. Some replanting may be necessary. Protective borders or windbreaks on the windward side of the wooded tracts help to prevent windthrow. Windthrown trees should be removed periodically. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the wetness, this soil is severely limited as a site for dwellings, local roads and streets, and septic tank absorption fields. Subsurface drains help to lower the water table on building sites. Footing drains and sump pumps may be needed. Properly designed roadside ditches and culverts minimize the road damage caused by wetness. Interceptor drains help to lower the water table in septic tank absorption fields. Alternative methods of sewage disposal should be considered. Public disposal systems generally are needed.

The land capability classification is IIw. The woodland ordination symbol is 3W.

La—Landes sandy loam, occasionally flooded. This nearly level, deep, well drained soil is on bottom land. It is occasionally flooded during winter and early spring. Areas are irregular in shape and are 5 to 20 acres in size. The dominant size is about 10 acres.

Typically, the surface layer is very dark grayish brown sandy loam about 8 inches thick. The subsurface layer also is very dark grayish brown sandy loam about 8 inches thick. The subsoil is about 38 inches thick. It is brown and very friable. The upper part is sandy loam, and the lower part is loamy sand. The underlying material to a depth of about 70 inches is yellowish brown sand. In some places the surface soil is more than 24 inches thick. In other places the surface layer is loamy sand. In a few areas the solum is thicker and is more acid. In some areas the surface layer is moderately dark, silty overwash. In some places the soil is only rarely flooded, and in other places it is frequently flooded.

Included with this soil in mapping are the moderately well drained Medway soils. These soils are in landscape positions similar to those of the Landes soil. Also included are poorly drained soils in depressions. Included soils make up about 5 percent of the map unit.

The Landes soil has a moderate available water capacity. Permeability is moderately rapid in the upper part of the soil and rapid in the lower part. The organic matter content is moderate in the surface layer. Runoff is slow.

Most areas of this soil are used for cultivated crops. A few are wooded or are used for hay and pasture.

This soil is well suited to corn, soybeans, and winter wheat. The flooding is the main hazard. It generally does not occur during the cropping season and only occasionally causes crop damage. Levees can control the flooding, but they are extremely expensive if they are constructed to provide total protection. Crops are affected by droughtiness when rainfall is insufficient or is poorly distributed. Crop residue management and additions of organic material, such as animal waste, improve tilth and increase the organic matter content and the available water capacity. The soil is well suited to spring plowing, spring chiseling, and a no-till cropping system.

This soil is well suited to grasses and legumes for hay and pasture. Deep-rooted legumes, such as alfalfa, grow well. Examples of suitable grasses are orchardgrass, timothy, and tall fescue. The flooding is the main hazard. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. Plant competition is severe. It can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the flooding, this soil is generally unsuitable as a site for dwellings and sanitary facilities and is severely limited as a site for local roads. Constructing the roads on raised, well compacted fill material helps to prevent the damage caused by floodwater.

The land capability classification is IIw. The woodland ordination symbol is 7A.

Ln—Lindside silt loam, frequently flooded. This nearly level, deep, moderately well drained soil is on bottom land. It is frequently flooded during winter and early spring. Areas are irregular in shape and are 5 to 150 acres in size. The dominant size is about 80 acres.

Typically, the surface layer is dark grayish brown silt loam about 7 inches thick. The subsoil is dark yellowish brown silt loam about 53 inches thick. The upper part is friable, and the lower part is mottled and firm. The underlying material to a depth of about 70 inches is grayish brown, mottled silt loam. In some places sand is within a depth of 40 inches. In other places the surface layer is sandy overwash.

Included with this soil in mapping are the well drained Nolin soils in the slightly higher landscape positions. Also included are the somewhat poorly drained Newark and very poorly drained Wilhite soils in the slightly lower positions. Included soils make up about 5 percent of the map unit.

The Lindside soil has a high available water capacity. Permeability is moderate or moderately slow. The organic matter content is moderate in the surface layer. Runoff is slow. The water table is at a depth of about 1.5 to 3.0 feet during winter and early spring.

Most areas of this soil are used for cultivated crops or woodland. A few are used as pasture.

This soil is well suited to corn and soybeans. The flooding is the main hazard. It generally does not occur during the cropping season and only occasionally causes crop damage. Levees can control the flooding, but they are extremely expensive if they are constructed to provide total protection. Cover crops and crop residue management improve tilth and increase the organic matter content. The soil is well suited to spring plowing, spring chiseling, and a no-till cropping system.

This soil is well suited to grasses and legumes for hay and pasture. Examples of suitable grasses are orchardgrass, timothy, and tall fescue, and examples of suitable legumes are ladino clover and red clover. The flooding is the main hazard. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. Plant competition is severe. It can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the flooding, this soil is generally unsuitable as a site for dwellings and sanitary facilities and is severely limited as a site for local roads. Constructing the roads on raised, well compacted fill material and providing adequate roadside ditches and culverts help to prevent the damage caused by floodwater.

The land capability classification is IIw. The woodland ordination symbol is 5A.

Ly—Lyles fine sandy loam. This nearly level, deep, very poorly drained soil is on river terraces. It is subject to ponding. Areas are irregular in shape and are 10 to 50 acres in size. The dominant size is about 15 acres.

Typically, the surface layer is very dark grayish brown fine sandy loam about 10 inches thick. The subsurface layer is about 26 inches of very dark gray fine sandy loam. The subsoil is dark gray, mottled, friable fine sandy loam about 15 inches thick. The underlying material to a depth of about 60 inches is light gray, mottled loamy fine sand. In some places the dark surface soil is thinner. In other places the surface layer is 6 to 10 inches of lighter colored overwash.

Included with this soil in mapping are the very poorly drained Rensselaer soils. These soils are in landscape positions similar to those of the Lyles soil. They have more clay than the Lyles soil. They make up about 5 percent of the map unit.

The Lyles soil has a high available water capacity. Permeability is moderate in the upper part of the soil and moderately rapid in the underlying material. The organic matter content is moderate in the surface layer. Runoff is very slow. The water table is near or above the surface during winter and early spring.

Most areas of this soil are used for cultivated crops. Some are wooded, and a few are used for hay and pasture.

If drained, this soil is well suited to corn, soybeans, and winter wheat. The wetness is the main limitation. Subsurface drains, surface drains, and open ditches help to remove excess water. Cover crops and crop residue management improve tilth and increase the organic matter content. The soil is well suited to a till-plant cropping system.

This soil is well suited to grasses and legumes for hay and pasture. It is better suited to grasses than to deep-rooted legumes because of the seasonal high water table. An example of a suitable grass is reed canarygrass, and an example of a suitable legume is ladino clover. A drainage system is needed. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. The equipment limitation, seedling mortality, the windthrow hazard, and plant competition are management concerns. Equipment should be used only during dry periods or when the ground is frozen. The trees should be planted only during dry periods. Special site preparation, such as bedding, increases the seedling survival rate. Some replanting may be necessary. Protective borders or windbreaks on the windward side of the wooded tracts help to prevent windthrow. Windthrown trees should be removed periodically. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the ponding, this soil is generally unsuitable as a site for dwellings and sanitary facilities. It is severely limited as a site for local roads because of the ponding and frost action. Constructing the roads on raised, well compacted fill material and providing properly designed roadside ditches and culverts help to prevent the damage caused by ponding and frost action.

The land capability classification is IIw. The woodland ordination symbol is 5W.

Lz—Lyles sandy loam, loamy substratum. This nearly level, deep, very poorly drained soil is on river terraces. It is subject to ponding. Areas are irregular in shape and are 5 to 1,000 acres in size. The dominant size is about 80 acres.

Typically, the surface layer is very dark gray sandy loam about 11 inches thick. The subsurface layer is about 23 inches of black and very dark gray, mottled sandy loam. The subsoil is mottled, friable sandy loam about 28 inches thick. The upper part is dark gray, and the lower part is gray. The underlying material to a depth of about 70 inches is gray, mottled sandy clay loam. In places the soil has less sand. In some small areas it is underlain by strata of loamy sand. In some areas the surface soil is less than 24 inches thick.

Included with this soil in mapping are the poorly drained Patton and Vincennes and very poorly drained Rensselaer soils. These soils are in landscape positions similar to those of the Lyles soil. Rensselaer soils are more clayey than the Lyles soil. Included soils make up about 5 percent of the map unit.

The Lyles soil has a high available water capacity. Permeability is moderate. The organic matter content is moderate in the surface layer. Runoff is very slow. The water table is near or above the surface during winter and early spring.

Most areas of this soil are used for cultivated crops. A few are wooded, and a few are used for hay and pasture.

If drained, this soil is well suited to corn, soybeans, and winter wheat. The wetness is the main limitation. Subsurface drains, surface drains, and open ditches help to remove excess water. Cover crops and crop residue management improve tilth and increase the organic matter content. The soil is well suited to a till-plant cropping system.

This soil is well suited to grasses and legumes for hay and pasture. It is better suited to grasses than to deep-rooted legumes because of the seasonal high water table. An example of a suitable grass is reed canarygrass, and an example of a suitable legume is ladino clover. A drainage system is needed. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. The equipment limitation, seedling mortality, the windthrow hazard, and plant competition are management concerns. Equipment should be used only during dry periods or when the ground is frozen. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling. Special site preparation, such as bedding, increases the seedling survival rate. Some replanting may be necessary. Protective borders or windbreaks on the windward side of the wooded tracts help to prevent windthrow. Windthrown trees should be removed periodically.

Because of the ponding, this soil is generally unsuitable as a site for dwellings and sanitary facilities. It is severely limited as a site for local roads because of the ponding and frost action. Constructing the roads on raised, well compacted fill material and providing properly designed roadside ditches and culverts help to prevent the damage caused by ponding and frost action.

The land capability classification is IIw. The woodland ordination symbol is 5W.

Ma—Maplehill silt loam, frequently flooded. This nearly level, deep, somewhat poorly drained soil is along drainageways on bottom land and lake plains. It is frequently flooded during winter and early spring. Areas are irregular in shape and are 5 to 50 acres in size. The dominant size is about 10 acres.

Typically, the surface layer is dark grayish brown silt loam about 8 inches thick. The subsurface layer is about 18 inches of dark grayish brown, mottled silt loam. Below this is a buried surface layer of very dark grayish brown and very dark gray silt loam about 21 inches thick. The buried subsoil to a depth of about 80 inches is mottled, friable silt loam. It is dark gray in the upper part and gray in the lower part. In some places the soil has more clay. In other places it is more acid. In some areas the buried solum has more sand. In a few areas the overwash is thinner.

Included with this soil in mapping are the poorly drained Evansville and very poorly drained Ragsdale soils. These soils are in landscape positions similar to those of the Maplehill soil. They make up about 8 percent of the map unit.

The Maplehill soil has a very high available water capacity. Permeability is moderate. The organic matter content is moderate in the surface layer. Runoff is very slow. The water table is at a depth of about 1 to 2 feet during winter and spring.

Most areas of this soil are used for cultivated crops. Some are wooded, and a few are used for hay and pasture.

If drained, this soil is well suited to corn, soybeans, and winter wheat. The wetness is the main limitation, and the flooding is the main hazard. Subsurface drains, surface drains, and open ditches help to remove excess water. The flooding generally does not occur during the cropping season and only occasionally causes crop damage. Levees can control the flooding, but they are extremely expensive if they are constructed to provide total protection. Cover crops and crop residue management improve tilth and increase the organic matter content. The soil is well suited to a ridge-plant cropping system.

This soil is well suited to grasses and legumes for hay and pasture. It is better suited to grasses than to deep-rooted legumes because of the seasonal high water table. Examples of suitable grasses are orchardgrass and tall fescue, and examples of suitable legumes are ladino clover and red clover. The flooding is the main hazard. A drainage system is needed. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. Plant competition is moderate. It can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the wetness and the flooding, this soil is generally unsuitable as a site for dwellings and septic tank absorption fields. It is severely limited as a site for local roads because of the flooding, low strength, and frost action. Constructing the roads on raised, well compacted fill material and providing properly designed roadside ditches and culverts help to prevent the damage caused by floodwater, low strength, and frost action.

The land capability classification is IIw. The woodland ordination symbol is 4A.

Md—Medway loam, occasionally flooded. This nearly level, deep, moderately well drained soil is on bottom land and low terraces. It is occasionally flooded during winter and early spring. Areas are irregular in shape and are 5 to 300 acres in size. The dominant size is about 30 acres.

Typically, the surface layer is very dark gray loam about 6 inches thick. The subsurface layer also is very dark gray loam. It is about 13 inches thick. The subsoil is about 38 inches thick. It is yellowish brown, friable and firm clay loam and loam in the upper part and grayish brown, mottled, firm sandy clay loam in the lower part.

The underlying material to a depth of about 70 inches is grayish brown sandy clay loam. In some areas the surface layer is light colored, silty overwash. In a few areas grayish mottles are closer to the surface. In some places the surface layer is thicker. In other places the slope is more than 2 percent.

Included with this soil in mapping are the well drained Armiesburg, Landes, and Skelton soils. These soils are in landscape positions similar to those of the Medway soil. Also included are the poorly drained Vincennes soils in depressions. Included soils make up about 10 percent of the map unit.

The Medway soil has a high available water capacity. Permeability is moderate. The organic matter content is high in the surface layer. Runoff is slow. The water table is at a depth of 1.5 to 3.0 feet during winter and early spring.

Most areas of this soil are used for cultivated crops. A few are wooded or are used for hay and pasture.

This soil is well suited to corn, soybeans, and winter wheat. The flooding is the main hazard. It generally does not occur during the cropping season and only occasionally causes crop loss. Levees can control the flooding, but they are extremely expensive if they are constructed to achieve total protection. Crop residue management improves tilth and increases the organic matter content. The soil is well suited to spring plowing, spring chiseling, and a no-till cropping system.

This soil is well suited to grasses and legumes for hay and pasture. Examples of suitable grasses are orchardgrass, timothy, and tall fescue, and examples of suitable legumes are alfalfa and red clover. The flooding is the main hazard. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. Plant competition is moderate. It can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the flooding, this soil is generally unsuitable as a site for dwellings and septic tank absorption fields. It is severely limited as a site for local roads because of the flooding, frost action, and low strength. Constructing the roads on raised, well compacted fill material and providing properly designed roadside ditches and culverts help to prevent the damage caused by floodwater, frost action, and low strength.

The land capability classification is IIw. The woodland ordination symbol is 5A.

Me—Medway loam, protected. This nearly level, deep, moderately well drained soil is on bottom land and low terraces. It is subject to rare flooding. Areas are irregular in shape and are 5 to 300 acres in size. The dominant size is about 30 acres.

Typically, the surface layer is very dark grayish brown loam about 11 inches thick. The subsurface layer is about 8 inches of brown clay loam. The subsoil is about 45 inches of yellowish brown, friable clay loam and loam. It is mottled in the lower part. The underlying material to a depth of about 80 inches is yellowish brown sandy loam. In some places the surface layer is light colored, silty overwash. In other places grayish mottles are closer to the surface. In some areas the surface layer is thicker. In other areas the slope is more than 2 percent. In places the solum is more acid.

Included with this soil in mapping are the well drained Armiesburg and Skelton soils. These soils are in landscape positions similar to those of the Medway soil. They are more silty than the Medway soil. Also included are the poorly drained Vincennes soils in depressions. Included soils make up about 10 percent of the map unit.

The Medway soil has a high available water capacity. Permeability is moderate. The organic matter content is high in the surface layer. Runoff is slow. The water table is at a depth of about 1.5 to 3.0 feet during winter and early spring.

Most areas of this soil are used for cultivated crops. Some are wooded, and a few are used for hay and pasture.

This soil is well suited to corn, soybeans, and winter wheat. Crop residue management helps to maintain the organic matter content. The soil is well suited to spring plowing, spring chiseling, and a no-till cropping system.

This soil is well suited to grasses and legumes for hay and pasture. Examples of suitable grasses are orchardgrass, timothy, and tall fescue, and examples of suitable legumes are ladino clover and red clover. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. Plant competition is moderate. It can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the flooding, this soil is generally unsuitable as a site for dwellings and sanitary facilities. It is severely limited as a site for local roads because of frost action and low strength. Constructing the roads on raised, well compacted fill material and providing properly designed roadside ditches and culverts help to prevent the damage caused by frost action and low strength.

The land capability classification is I. The woodland ordination symbol is 5A.

Mg—Montgomery silty clay loam. This nearly level, deep, very poorly drained soil is on river terraces. It is subject to ponding. Areas are irregular in shape and are 10 to more than 200 acres in size. The dominant size is about 140 acres.

Typically, the surface layer is very dark gray silty clay loam about 8 inches thick. The subsurface layer also is very dark gray silty clay loam. It is about 14 inches thick. The subsoil is mottled, firm silty clay about 26 inches thick. The upper part is dark gray, and the lower part is light gray. The underlying material to a depth of about 60 inches is gray, mottled silty clay loam. In some areas the soil has more sand. In other areas the surface soil is more than 23 inches thick. In some small areas the soil is underlain by sandy clay loam, loam, or clay loam. In places the underlying material has strata of silt loam or sand. In a few areas it is not calcareous.

Included with this soil in mapping are the poorly drained Lyles, Rensselaer, and Patton and very poorly drained Zipp soils. These soils are in landscape positions similar to those of the Montgomery soil. Lyles, Rensselaer, and Patton soils are more sandy than the Montgomery soil, and Zipp soils have a lighter colored surface layer. Included soils make up about 10 percent of the map unit.

The Montgomery soil has a high available water capacity. Permeability is slow. The organic matter content is high in the surface layer. This layer tends to be sticky or cloddy unless it is tilled within a narrow range in moisture content. Runoff is very slow. The water table is near or above the surface during winter and early spring.

Most areas of this soil are used for cultivated crops. A few are wooded.

If drained, this soil is fairly well suited to corn, soybeans, and winter wheat. The ponding is the main hazard. Subsurface drains, surface drains, and open ditches help to remove excess water. The soil is well suited to fall plowing, fall chiseling, and a ridge-plant cropping system.

This soil is well suited to grasses and legumes for hay and pasture. It is better suited to grasses than to deep-rooted legumes because of the seasonal high water table. Examples of suitable grasses are reed canarygrass and tall fescue, and an example of a suitable legume is ladino clover. The ponding is the main hazard. A drainage system is needed. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. The equipment limitation, seedling mortality, the windthrow hazard, and plant competition are management concerns. Equipment should be used only during dry periods or when the ground is frozen. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling. Special site preparation, such as bedding, increases the seedling survival rate. Some replanting may be necessary. Protective borders or windbreaks on the windward side of the wooded tracts help to prevent windthrow. Windthrown trees should be removed periodically.

Because of the ponding, this soil is generally unsuitable as a site for dwellings and sanitary facilities. It is severely limited as a site for local roads because of the ponding, low strength, and the shrink-swell potential. Constructing the roads on raised, well compacted fill material, strengthening or replacing the base with better suited material, and providing adequate roadside ditches and culverts minimize the damage caused by low strength, ponding, and shrinking and swelling and improve the ability of the roads to support vehicular traffic.

The land capability classification is IIIw. The woodland ordination symbol is 5W.

Mh—Moundhaven fine sandy loam, frequently flooded. This nearly level, deep, somewhat excessively drained soil is on bottom land. It is frequently flooded for very brief periods during winter and spring. Areas generally are long and relatively narrow and are 5 to 100 acres in size. The dominant size is about 35 acres.

Typically, the surface layer is yellowish brown fine sandy loam about 9 inches thick. The upper part of the underlying material is yellowish brown and light yellowish brown loamy fine sand and fine sand. The next part is light yellowish brown and yellowish brown sand. The lower part to a depth of about 80 inches is very pale brown loamy fine sand. In some places the surface layer is sandy loam, loam, or silt loam. In other places finer textured strata are dominant in the control section. In a few places the soil is leached of free carbonates to a depth of 40 inches or more. In some areas silt loam is below a depth of 40 inches. In other areas the slope is more than 2 percent.

Included with this soil in mapping are the well drained Chagrin, Haymond, Nolin, and Wirt soils. These soils are in landscape positions similar to those of the Moundhaven soil. Also included are somewhat poorly drained soils in depressions and old channels. Included soils make up about 15 percent of the map unit.

The Moundhaven soil has a low available water capacity. Permeability is rapid. The organic matter content is low in the surface layer. Runoff is slow.

Most areas of this soil are used for cultivated crops. Some are wooded, and a few are used as wildlife habitat.

This soil is fairly well suited to corn and soybeans. The flooding is the main hazard. It occasionally causes some crop loss. Levees can help to control the flooding, but they are very expensive if they are constructed to provide total protection. Crops are affected by droughtiness when rainfall is insufficient or is poorly distributed. The soil is well suited to spring plowing, spring chiseling, and a no-till cropping system.

This soil is well suited to grasses and legumes for hay and pasture. It is better suited to deep-rooted legumes

than to grasses because of the low available water capacity. Examples of suitable grasses are orchardgrass, timothy, and tall fescue, and examples of suitable legumes are alfalfa and red clover. The flooding is the main hazard. Proper stocking rates, pasture rotation, and timely deferment of grazing help to keep the pasture in good condition.

This soil is well suited to trees. Seedling mortality, the windthrow hazard, and plant competition are the main management concerns. Special site preparation, such as furrowing before planting, reduces the seedling mortality rate. Harvest methods that do not isolate the remaining trees or leave them widely spaced help to prevent windthrow. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the flooding, this soil is generally unsuitable as a site for dwellings and septic tank absorption fields and is severely limited as a site for local roads. Constructing the roads on raised, well compacted fill material and providing adequate roadside ditches and culverts minimize the damage caused by floodwater.

The land capability classification is IIIw. The woodland ordination symbol is 4S.

MuA—Muren silt loam, 0 to 2 percent slopes. This nearly level, deep, moderately well drained soil is on broad ridgetops and low benches in the uplands. Areas are irregular in shape and are 5 to 60 acres in size. The dominant size is about 15 acres.

Typically, the surface layer is dark grayish brown silt loam about 9 inches thick. The subsurface layer is about 5 inches of yellowish brown silt loam. The subsoil is silt loam about 45 inches thick. The upper part is yellowish brown and friable; the next part is yellowish brown, mottled, and friable; and the lower part is dark yellowish brown, mottled, and firm and friable. The underlying material to a depth of about 70 inches is light brownish gray, mottled silt loam. In some places the slope is more than 2 percent. In other places the underlying material is less acid.

Included with this soil in mapping are the well drained Alford and well drained and moderately well drained Hosmer soils. These soils are in landscape positions similar to those of the Muren soil. Also included are the somewhat poorly drained Iva and Reesville soils in the slightly lower landscape positions and small areas of poorly drained soils in depressions. Included soils make up about 5 percent of the map unit.

The Muren soil has a high available water capacity. Permeability is moderate. The organic matter content is moderately low in the surface layer. Runoff is slow. The water table is at a depth of 2 to 6 feet during late winter and early spring.

Most areas of this soil are used for cultivated crops. Some are wooded, and a few are used for hay and pasture.

This soil is well suited to corn, soybeans, and winter wheat. No major hazards or limitations affect cropping. The soil is well suited to till-plant and no-till cropping systems.

This soil is well suited to grasses and legumes for hay and pasture. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. Plant competition is severe. It can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the wetness, this soil is severely limited as a site for dwellings with basements. It is moderately limited as a site for dwellings without basements because of the shrink-swell potential and the wetness. A foundation drainage system lowers the water table. Footing drains and sump pumps may be needed. Properly sealing the walls and backfilling around the footing drains with sand reduce the wetness on sites for dwellings with basements. Strengthening foundations, footings, and basement walls and backfilling with coarse textured material help to prevent the structural damage caused by shrinking and swelling.

Because of low strength and frost action, this soil is severely limited as a site for local roads and streets. Properly designed roadside ditches and culverts and a more stable base material, such as sand or gravel, help to overcome these limitations.

Because of the wetness, this soil is severely limited as a site for septic tank absorption fields. Installing interceptor drains around the absorption field lowers the water table. Alternative methods of sewage disposal should be considered. Public disposal systems generally are needed.

The land capability classification is I. The woodland ordination symbol is 5A.

MuB2—Muren silt loam, 2 to 6 percent slopes, eroded. This gently sloping, deep, moderately well drained soil is on ridgetops in the uplands. Areas are irregular in shape and are 3 to more than 200 acres in size. The dominant size is about 30 acres.

Typically, the surface layer is mixed brown and yellowish brown silt loam about 9 inches thick. The subsoil is about 45 inches thick. It is yellowish brown, mottled, friable and firm silt loam and silty clay loam. The underlying material to a depth of about 80 inches is yellowish brown, mottled silt loam. In some places it is more acid. In other places the slope is less than 2 or more than 6 percent.

Included with this soil in mapping are the well drained Alford and well drained and moderately well drained

Hosmer soils. These soils are in landscape positions similar to those of the Muren soil. Also included are severely eroded areas and areas of the somewhat poorly drained Reesville soils in depressions. Included soils make up about 10 percent of the map unit.

The Muren soil has a high available water capacity. Permeability is moderate. The organic matter content is moderately low in the surface layer. Runoff is medium. The water table is at a depth of about 2 to 6 feet during late winter and early spring.

Most areas of this soil are used for cultivated crops. Some are wooded, and a few are used for hay and pasture.

This soil is well suited to corn, soybeans, and winter wheat. Water erosion is the main hazard. It can be controlled by a crop rotation that includes grasses and legumes and by terraces, water- and sediment-control basins, grassed waterways, a system of conservation tillage that leaves all or part of the crop residue on the surface, grade stabilization structures, and cover crops. The soil is well suited to till-plant and no-till cropping systems. Crop residue management and cover crops help to maintain soil structure and tilth and increase the organic matter content.

This soil is well suited to grasses and legumes for hay and pasture. Examples of suitable grasses are orchardgrass, timothy, and tall fescue, and examples of suitable legumes are alfalfa and red clover. Water erosion is the main hazard. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to control water erosion and keep the pasture in good condition.

This soil is well suited to trees. Plant competition is severe. It can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the wetness, this soil is severely limited as a site for dwellings with basements. It is severely limited as a site for dwellings without basements because of the shrink-swell potential and the wetness. A foundation drainage system lowers the water table. Footing drains and sump pumps may be needed. Properly sealing the walls and backfilling around the footing drains with sand reduce the wetness on sites for dwellings with basements. Strengthening foundations, footings, and basement walls and backfilling with coarse textured material help to prevent the structural damage caused by shrinking and swelling.

Because of low strength and frost action, this soil is severely limited as a site for local roads and streets. Properly designed roadside ditches and culverts and a more stable base material, such as sand or gravel, help to overcome these limitations.

Because of the wetness, this soil is severely limited as a site for septic tank absorption fields. Installing interceptor drains around the absorption field lowers the water table. Alternative methods of sewage disposal should be considered. Public disposal systems generally are needed.

The land capability classification is IIe. The woodland ordination symbol is 5A.

Nk—Newark silty clay loam, frequently flooded. This nearly level, deep, somewhat poorly drained soil is in old channels, depressions, and drainageways on bottom land. It is frequently flooded during winter and early spring. Areas are long and narrow and are 10 to 30 acres in size.

Typically, the surface layer is brown silty clay loam about 9 inches thick. The upper part of the subsoil is dark yellowish brown, mottled, firm silty clay loam. The lower part to a depth of about 80 inches is grayish brown, mottled, firm and friable silt loam. In some areas the soil has 8 to 20 inches of stratified overwash. In a few places it is coarser textured below a depth of 24 inches. In some areas it has grayish colors closer to the surface. In a few places the underlying material has strata of loamy sand or sand.

Included with this soil in mapping are the well drained Haymond and Nolin and moderately well drained Lindside soils. These soils are slightly higher on the landscape than the Newark soil. Also included are soils that are ponded during part of the growing season. Included soils make up about 15 percent of the map unit.

The Newark soil has a very high available water capacity. Permeability is moderate. The organic matter content is moderate in the surface layer. Runoff is very slow. The water table is at a depth of 0.5 foot to 1.5 feet during winter and early spring.

Most areas of this soil are used for cultivated crops. Some are used as woodland or pasture.

If drained, this soil is well suited to corn and soybeans. The wetness is the main limitation. The flooding is the main hazard. It occasionally causes crop loss. Levees help to control the flooding. Subsurface drains, surface drains, or open ditches can remove excess water, but an adequate outlet commonly is not available. Conservation tillage, cover crops, and crop residue management help to maintain tilth and the organic matter content. The soil is well suited to a ridge-till cropping system if the ridges follow the direction of natural drainage or streamflow.

This soil is well suited to grasses and legumes for hay and pasture. Examples of suitable grasses are orchardgrass and tall fescue, and examples of suitable legumes are ladino clover and red clover. A drainage system is needed in most areas. The flooding is a hazard. Overgrazing or grazing during wet periods results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. The equipment limitation, the windthrow hazard, and plant competition

are the main management concerns. Equipment should be used only during dry periods or when the ground is frozen. Windthrown trees should be removed periodically. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the flooding, this soil is generally unsuitable as a site for dwellings and septic tank absorption fields. It is severely limited as a site for local roads because of the flooding, low strength, and the wetness. Constructing the roads on raised, well compacted fill material, strengthening or replacing the base with better suited material, and providing adequate roadside ditches and culverts minimize the damage caused by low strength, floodwater, and wetness. Levees help to control flooding.

The land capability classification is IIw. The woodland ordination symbol is 4W.

Nn—Nolin silt loam, protected. This nearly level, deep, well drained soil is on bottom land. It is subject to rare flooding. Areas are generally long and narrow and are 3 to 20 acres in size. The dominant size is about 15 acres.

Typically, the surface layer is brown silt loam about 8 inches thick. The subsoil to a depth of about 80 inches is dark yellowish brown, friable silt loam. It is mottled in the lower part. In some places the lower part of the subsoil is coarser textured. In other places grayish mottles are closer to the surface.

Included with this soil in mapping are the somewhat poorly drained Newark, very poorly drained Wilhite, and well drained Armiesburg soils. Newark and Wilhite soils are in old channels. Armiesburg soils are in landscape positions similar to those of the Nolin soil. Their surface layer is darker than that of the Nolin soil. Also included are areas along old channels where the slope is 2 to 8 percent and small areas where the soil has 10 to 20 inches of sandy overwash. Included soils make up about 15 percent of the map unit.

The Nolin soil has a very high available water capacity. Permeability is moderate. The organic matter content is moderate in the surface layer. Runoff is slow. The water table is at a depth of about 3 to 6 feet during winter and early spring.

Most areas of this soil are used for cultivated crops. Some are used as woodland or pasture.

This soil is well suited to corn and soybeans. No major hazards or limitations affect cropping.

This soil is well suited to grasses and legumes for hay and pasture. Examples of suitable grasses are orchardgrass, timothy, and tall fescue, and examples of suitable legumes are alfalfa, red clover, and lespedeza. Overgrazing or grazing during wet periods results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. The equipment limitation and plant competition are the main management concerns. Equipment should be used only during dry periods or when the ground is frozen. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the flooding, this soil is generally unsuitable as a site for dwellings and sanitary facilities. It is severely limited as a site for local roads because of low strength. Providing a more stable base material, such as sand or gravel, helps to overcome this limitation.

The land capability classification is I. The woodland ordination symbol is 8A.

No—Nolin silt loam, frequently flooded. This nearly level, deep, well drained soil is on bottom land. It is frequently flooded during winter and early spring. Areas are generally long and narrow and are 3 to 80 acres in size. The dominant size is about 15 acres.

Typically, the surface layer is dark grayish brown silt loam about 10 inches thick. The subsoil to a depth of about 80 inches is dark yellowish brown and yellowish brown, friable silt loam. It is mottled in the lower part. In some places the lower part of the subsoil is coarser textured. In other places grayish mottles are closer to the surface.

Included with this soil in mapping are the somewhat poorly drained Newark and very poorly drained Wilhite soils in old channels and the well drained Haymond soils in the slightly higher landscape positions. Haymond soils are less clayey than the Nolin soil. Also included are areas along old channels where the slope is 2 to 18 percent and areas where the soil has 10 to 20 inches of sandy overwash. Included soils make up about 15 percent of the map unit.

The Nolin soil has a very high available water capacity. Permeability is moderate. The organic matter content is moderate in the surface layer. Runoff is slow. The water table is at a depth of 3 to 6 feet during winter and early spring.

Most areas of this soil are used for cultivated crops. Some are used as woodland or pasture.

This soil is well suited to corn and soybeans. The flooding is the main hazard. It generally does not occur during the cropping season and only occasionally causes crop damage. It can be controlled by levees. The soil is well suited to spring plowing, spring chiseling, and a no-till cropping system.

This soil is well suited to grasses and legumes for hay and pasture. Examples of suitable grasses are orchardgrass and tall fescue, and an example of a suitable legume is ladino clover. The flooding is the main hazard. Overgrazing or grazing during wet periods results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and

restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. The equipment limitation, seedling mortality, and plant competition are the main management concerns. Equipment should be used only during dry periods or when the ground is frozen. Special site preparation, such as bedding, reduces the seedling mortality rate. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the flooding, this soil is generally unsuitable as a site for dwellings and septic tank absorption fields. It is severely limited as a site for local roads because of the flooding and low strength. Constructing the roads on raised, well compacted fill material, strengthening or replacing the base with better suited material, and providing adequate roadside ditches and culverts minimize the damage caused by floodwater and low strength.

The land capability classification is IIIw. The woodland ordination symbol is 8W.

Pn—Patton silty clay loam. This nearly level, deep, poorly drained soil is on lacustrine plains and river terraces. It is subject to ponding. Areas are irregular in shape and are 5 to 200 acres in size. The dominant size is about 60 acres.

Typically, the surface layer is very dark gray silty clay loam about 9 inches thick. The subsurface layer is about 14 inches of black silty clay loam. The subsoil is about 44 inches of dark gray and gray, mottled, firm silty clay loam and silt loam. The underlying material to a depth of about 70 inches is gray, mottled silt loam. In places the surface layer is thinner. In a few areas it is silt loam. In some areas loamy strata are below a depth of 60 inches.

Included with this soil in mapping are the very poorly drained Lyles and Rensselaer soils. These soils are in landscape positions similar to those of the Patton soil. They have more sand in the surface layer and subsoil than the Patton soil. They make up about 10 percent of the map unit.

The Patton soil has a very high available water capacity. Permeability is moderate in the upper part of the soil and moderately slow in the underlying material. The organic matter content is high in the surface layer. This layer tends to be sticky or cloddy unless it is tilled within a narrow range in moisture content. Runoff is very slow. The water table is near or above the surface during winter and early spring.

Most areas of this soil are used for cultivated crops. Some are used for hay and pasture, and a few are wooded.

If drained, this soil is well suited to corn, soybeans, and winter wheat. The ponding is the main hazard. Subsurface drains, surface drains, and open ditches help to remove excess water. Cover crops and crop residue management improve tilth and increase the organic matter content. The soil is well suited to fall chiseling and to till-plant and ridge-plant cropping systems.

This soil is well suited to grasses and legumes for hay and pasture. It is better suited to grasses than to deep-rooted legumes because of the seasonal high water table. Examples of suitable grasses are reed canarygrass and tall fescue, and an example of a suitable legume is ladino clover. The ponding is the main hazard. A drainage system is needed. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. The equipment limitation, seedling mortality, the windthrow hazard, and plant competition are management concerns. Equipment should be used only during dry periods or when the ground is frozen. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling. Special site preparation, such as bedding, increases the seedling survival rate. Protective borders or windbreaks on the windward side of the wooded tracts help to prevent windthrow. Windthrown trees should be removed periodically.

Because of the ponding, this soil is generally unsuitable as a site for dwellings and septic tank absorption fields. It is severely limited as a site for local roads because of the ponding, low strength, and frost action. Properly designed roadside ditches and culverts and a more stable base material, such as sand or gravel, help to overcome these limitations.

The land capability classification is IIw. The woodland ordination symbol is 5W.

Po—Peoga silt loam. This nearly level, deep, poorly drained soil is on terraces. Areas are irregular in shape and are 3 to more than 120 acres in size. The dominant size is about 40 acres.

Typically, the surface layer is grayish brown silt loam about 11 inches thick. The subsurface layer is about 8 inches of light gray, mottled silt loam. The subsoil is light gray, mottled silt loam about 46 inches thick. It is friable in the upper part and firm in the lower part. The underlying material to a depth of about 75 inches is light gray, mottled silt loam.

Included with this soil in mapping are the somewhat poorly drained Iva soils in the slightly higher landscape positions. These soils make up about 8 percent of the map unit.

The Peoga soil has a high available water capacity. Permeability is slow. The organic matter content is moderately low in the surface layer. Runoff is slow. The water table is at or near the surface during winter and early spring.

Most areas of this soil are used for cultivated crops. Some are wooded, and a few are used for hay and pasture.

If drained, this soil is well suited to corn, soybeans, and winter wheat. The wetness is the main limitation. Subsurface drains, surface drains, and open ditches help to remove excess water. Cover crops and crop residue management improve tilth and increase the organic matter content.

This soil is well suited to grasses and legumes for hay and pasture. It is better suited to grasses than to deep-rooted legumes because of the seasonal high water table. Examples of suitable grasses are reed canarygrass and tall fescue, and an example of a suitable legume is ladino clover. A drainage system is needed. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. The equipment limitation, seedling mortality, the windthrow hazard, and plant competition are management concerns. Equipment should be used only during dry periods or when the ground is frozen. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling. Special site preparation, such as bedding, increases the seedling survival rate. Some replanting may be necessary. Protective borders or windbreaks on the windward side of the wooded tracts help to prevent windthrow. Windthrown trees should be removed periodically.

Because of the wetness, this soil is severely limited as a site for dwellings. A combination of storm sewers and a foundation drainage system is needed to lower the water table. Footing drains and sump pumps may be needed. Properly sealing the walls and backfilling around the footing drains with sand reduce the wetness on sites for dwellings with basements.

Because of the wetness, frost action, and low strength, this soil is severely limited as a site for local roads and streets. Constructing the roads and streets on raised, well compacted fill material, strengthening or replacing the base with better suited material, and providing adequate roadside ditches and culverts minimize the damage caused by wetness, frost action, and low strength and improve the ability of the roads and streets to support vehicular traffic.

Because of the wetness and the slow permeability, this soil is severely limited as a site for septic tank absorption fields. Installing interceptor drains around the absorption field lowers the water table. Enlarging the absorption area and controlling the rate of flow from a holding tank improve the ability of the field to absorb the effluent. Alternative methods of sewage disposal should be considered. Public disposal systems generally are needed.

The land capability classification is IIIw. The woodland ordination symbol is 5W.

Pp—Petrolia silt loam, frequently flooded. This nearly level, deep, poorly drained soil is on bottom land. During late winter and early spring, it is frequently flooded and is subject to ponding. Areas are irregular in shape and are 5 to more than 1,000 acres in size.

Typically, the surface layer is dark grayish brown silt loam about 11 inches thick. The subsoil is gray and light gray, mottled, friable silty clay loam about 35 inches thick. The underlying material to a depth of about 60 inches is light brownish gray, mottled silty clay loam. In some places the surface layer is lighter colored overwash. In other places the subsoil has more clay.

Included with this soil in mapping are the somewhat poorly drained Henshaw Variant soils in the slightly higher landscape positions. Also included are sandy spots, areas of silty material along drainage ditches, and marshy spots. Included soils make up about 10 percent of the map unit.

The Petrolia soil has a high available water capacity. Permeability is moderately slow. The organic matter content is moderately low in the surface layer. Runoff is very slow. The water table is near or above the surface during winter and spring.

Most areas of this soil are used for cultivated crops. Some are wooded, and a few are used for hay and pasture.

If drained, this soil is fairly well suited to corn, soybeans, and winter wheat. The flooding and the ponding are the main hazards. The flooding generally does not occur during the cropping season and only occasionally causes crop damage. Levees can help to control the flooding, but they are extremely expensive if they are constructed to provide total protection. Subsurface drains, surface drains, and open ditches help to remove excess water. Cover crops and crop residue management help to maintain tilth and increase the organic matter content.

This soil is well suited to grasses and legumes for hay and pasture. It is better suited to grasses than to deep-rooted legumes because of the seasonal high water table. Examples of suitable grasses are reed canarygrass and tall fescue, and an example of a suitable legume is ladino clover. The flooding and the ponding are the main hazards. A drainage system is needed. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. The equipment limitation, seedling mortality, and plant competition are the main management concerns. Equipment should be used only during dry periods or when the ground is frozen. Competing vegetation can be controlled by

proper site preparation or by spraying, cutting, or girdling. Special site preparation, such as bedding, increases the seedling survival rate. Some replanting may be necessary.

Because of the ponding and the flooding, this soil is generally unsuitable as a site for dwellings and sanitary facilities. It is severely limited as a site for local roads because of the ponding, the flooding, and low strength. Constructing the roads on raised, well compacted fill material and providing adequate roadside ditches and culverts minimize the damage caused by ponding, flooding, and low strength and improve the ability of the roads to support vehicular traffic.

The land capability classification is IIIw. The woodland ordination symbol is 5W.

Pv—Petrolia silty clay loam, frequently flooded, very long duration. This nearly level, deep, poorly drained soil is in depressions on bottom land. During late winter and early spring, it is frequently flooded and is subject to ponding. It is often covered with water for more than 30 days. Areas are 15 to more than 1,000 acres in size. The dominant size is about 700 acres.

Typically, the surface layer is dark grayish brown silty clay loam about 8 inches thick. The subsoil to a depth of about 80 inches is mottled, firm silty clay loam. It is gray in the upper part and light gray in the lower part. In some places the soil has more clay or is more acid. In other places the surface layer is darker.

Included with this soil in mapping are the somewhat poorly drained Henshaw Variant soils in the slightly higher areas. Also included are the moderately well drained Steff and somewhat poorly drained Stendal soils, which are closer to stream channels and drainageways than the Petrolia soil. Included soils make up about 8 percent of the map unit.

The Petrolia soil has a high available water capacity. Permeability is moderately slow. The organic matter content is moderate in the surface layer. This layer tends to be sticky or cloddy unless it is tilled within a narrow range in moisture content. Runoff is very slow. The water table is near or above the surface during winter and spring.

Most areas are used for cultivated crops. Some are wooded. A few are used as wildlife habitat. Because of the ponding and the flooding, this soil is poorly suited to soybeans, is generally unsuitable for corn and small grain, and is poorly suited to grasses and legumes for hay and pasture.

This soil is fairly well suited to trees. The equipment limitation, seedling mortality, and plant competition are the main management concerns. Equipment should be used only during dry periods or when the ground is frozen. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling. Special site preparation, such as bedding, increases the seedling survival rate. Some replanting may be necessary.

Because of the ponding and the flooding, this soil is generally unsuitable as a site for dwellings and sanitary facilities. It is severely limited as a site for local roads because of the flooding, the ponding, and low strength. Constructing the roads on raised, well compacted fill material, strengthening or replacing the base with better suited material, and providing adequate roadside ditches and culverts minimize the damage caused by flooding, ponding, and low strength and improve the ability of the roads to support vehicular traffic.

The land capability classification is Vw. The woodland ordination symbol is 5W.

Pw—Pits, sand. This map unit consists of open excavations and stockpiled sand. It is on river terraces. The excavations are generally filled with water. Areas are 20 to 40 acres in size. Slopes range from 2 to 40 percent.

Included in this unit in mapping are large piles of gravel.

Most areas support little or no vegetation, but some abandoned areas support drought-tolerant weeds and shrubs.

No land capability classification or woodland ordination symbol is assigned.

Ra—Ragsdale silt loam. This nearly level, deep, very poorly drained soil is on lake plains. It is subject to ponding. Areas are irregular in shape and are 3 to 200 acres in size. The dominant size is about 40 acres.

Typically, the surface layer is very dark gray silt loam about 9 inches thick. The subsurface layer also is very dark gray silt loam. It is about 11 inches thick. The subsoil is mottled, friable silt loam about 36 inches thick. The upper part is grayish brown, the next part is dark gray, and the lower part is light brownish gray. The underlying material to a depth of about 60 inches is light brownish gray, mottled silt loam. In some places the subsoil contains more clay. In other places the surface layer is lighter colored, silty overwash.

Included with this soil in mapping are the poorly drained Evansville and somewhat poorly drained Reesville soils. Evansville soils are in landscape positions similar to those of the Ragsdale soil. Reesville soils are in the slightly higher positions. Also included are sandy or loamy spots along drainageways. Included soils make up about 5 percent of the map unit.

The Ragsdale soil has a very high available water capacity. Permeability is moderate. The organic matter content is high in the surface layer. Runoff is very slow. The water table is near or above the surface during winter and early spring.

Most areas of this soil are used for cultivated crops. A few are wooded or are used for hay and pasture.

If drained, this soil is well suited to corn, soybeans, and winter wheat. The ponding is the main hazard. Subsurface drains, surface drains, and open ditches help to remove excess water. Cover crops and crop residue management help to maintain tilth and the organic matter content. The soil is well suited to fall chiseling and to till-plant and ridge-plant cropping systems.

This soil is well suited to grasses and legumes for hay and pasture. It is better suited to grasses than to deep-rooted legumes because of the seasonal high water table. Examples of suitable grasses are reed canarygrass and tall fescue, and an example of a suitable legume is ladino clover. The ponding is the main hazard. A drainage system is needed. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. The equipment limitation, seedling mortality, the windthrow hazard, and plant competition are management concerns. Equipment should be used only during dry periods or when the ground is frozen. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling. Special site preparation, such as bedding, increases the seedling survival rate. Some replanting may be necessary. Protective borders or windbreaks on the windward side of the wooded tracts help to prevent windthrow. Windthrown trees should be removed periodically.

Because of the ponding, this soil is generally unsuitable as a site for dwellings and septic tank absorption fields. It is severely limited as a site for local roads because of the ponding, low strength, and frost action. Constructing the roads on raised, well compacted fill material, strengthening or replacing the base with better suited material, and providing adequate roadside ditches and culverts minimize the damage caused by ponding, low strength, and frost action and improve the ability of the roads to support vehicular traffic.

The land capability classification is IIw. The woodland ordination symbol is 5W.

Rb—Ragsdale silt loam, overwash. This nearly level, deep, very poorly drained soil is on lake plains. It is subject to ponding. Areas are irregular in shape and are 3 to 200 acres in size. The dominant size is about 40 acres.

Typically, the surface layer is dark grayish brown silt loam about 14 inches thick. Below this is a buried surface layer of very dark gray silt loam about 16 inches thick. The buried subsoil is gray and yellowish brown, mottled, friable silt loam about 20 inches thick. The underlying material to a depth of about 60 inches is light brownish gray, mottled silt loam. In some places the overwash is thinner, and in other places it is thicker. In some areas the buried surface layer is not so dark.

Included with this soil in mapping are the somewhat poorly drained Maplehill and Reesville and poorly drained Evansville soils. Maplehill and Evansville soils are in landscape positions similar to those of the Ragsdale soil. Reesville soils are in the slightly higher positions. Also included are sandy or loamy spots along drainage ditches. Included soils make up about 5 percent of the map unit.

The Ragsdale soil has a very high available water capacity. Permeability is moderate. The organic matter content is low in the overwash and high in the buried surface layer. Runoff is very slow. The water table is near or above the surface during winter and early spring.

Most areas of this soil are used for cultivated crops. A few are wooded or are used for hay and pasture.

If drained, this soil is well suited to corn and soybeans. The ponding is the main hazard. Subsurface drains, surface drains, and open ditches help to remove excess water. Cover crops and crop residue management help to maintain tilth and increase the organic matter content. The soil is well suited to fall chiseling and to till-plant and ridge-plant cropping systems.

This soil is well suited to grasses and legumes for hay and pasture. It is better suited to grasses than to deep-rooted legumes because of the seasonal high water table. Examples of suitable grasses are reed canarygrass and tall fescue, and an example of a suitable legume is ladino clover. The ponding is the main hazard. A drainage system is needed. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. The equipment limitation, seedling mortality, the windthrow hazard, and plant competition are management concerns. Equipment should be used only during dry periods or when the ground is frozen. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling. Special site preparation, such as bedding, increases the seedling survival rate. Some replanting may be necessary. Protective borders or windbreaks on the windward side of the wooded tracts help to prevent windthrow. Windthrown trees should be removed periodically.

Because of the ponding, this soil is generally unsuitable as a site for dwellings and septic tank absorption fields. It is severely limited as a site for local roads because of the ponding and frost action. Constructing the roads on raised, well compacted fill material, strengthening or replacing the base with better suited material, and providing adequate roadside ditches and culverts minimize the damage caused by ponding

and frost action and improve the ability of the roads to support vehicular traffic.

The land capability classification is IIw. The woodland ordination symbol is 5W.

RlA—Reesville silt loam, 0 to 2 percent slopes. This nearly level, deep, somewhat poorly drained soil is on lake plains. Areas are irregular in shape and are 3 to more than 100 acres in size. The dominant size is about 15 acres.

Typically, the surface layer is brown silt loam about 10 inches thick. The subsurface layer is about 11 inches of light brownish gray, mottled silt loam. The subsoil is mottled silt loam about 31 inches thick. It is yellowish brown and friable in the upper part, grayish brown and firm in the next part, and yellowish brown and firm in the lower part. The underlying material to a depth of about 60 inches is light olive brown, mottled silt loam. In places free carbonates are at a depth of 40 to 80 inches.

Included with this soil in mapping are the poorly drained Evansville and very poorly drained Ragsdale soils in depressions. Also included are the moderately well drained Uniontown soils in the higher landscape positions. Included soils make up about 10 percent of the map unit.

The Reesville soil has a high available water capacity. Permeability is moderate. The organic matter content is moderate in the surface layer. Runoff is slow. The water table is at a depth of about 1.0 to 2.5 feet during winter and early spring.

Most areas of this soil are used for cultivated crops. Some are wooded, and a few are used for hay and pasture.

If drained, this soil is well suited to corn, soybeans, and winter wheat. The wetness is the main limitation. Subsurface drains, surface drains, and open ditches help to remove excess water. Cover crops and crop residue management improve tilth and increase the organic matter content. The soil is well suited to fall chiseling and to a till-plant cropping system.

This soil is well suited to grasses and legumes for hay and pasture. It is better suited to grasses than to deep-rooted legumes because of the seasonal high water table. Examples of suitable grasses are orchardgrass and tall fescue, and examples of suitable legumes are ladino clover and red clover. A drainage system is needed. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. Plant competition and the equipment limitation are the main management concerns. Equipment should be used only during dry periods or when the ground is frozen. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the wetness, this soil is severely limited as a site for dwellings. A combination of storm sewers and a foundation drainage system is needed to lower the water table. Footing drains and sump pumps may be needed.

Because of low strength and frost action, this soil is severely limited as a site for local roads and streets. Properly designed roadside ditches and culverts and a more stable base material, such as sand or gravel, help to overcome these limitations.

Because of the wetness, this soil is severely limited as a site for septic tank absorption fields. Installing interceptor drains around the absorption field lowers the water table. Alternative methods of sewage disposal should be considered. Public disposal systems generally are needed.

The land capability classification is IIw. The woodland ordination symbol is 4W.

Rr—Rensselaer fine sandy loam, loamy substratum. This nearly level, deep, very poorly drained soil is on river terraces. It is subject to ponding. Areas are irregular in shape and are 5 to more than 1,000 acres in size. The dominant size is about 40 acres.

Typically, the surface layer is very dark gray fine sandy loam about 9 inches thick. The subsurface layer is about 10 inches of very dark gray sandy clay loam. The subsoil is about 33 inches thick. It is friable. It is dark gray sandy clay loam in the upper part; gray, mottled sandy clay loam in the next part; and dark gray, mottled sandy loam in the lower part. The underlying material to a depth of about 60 inches is gray, mottled loam. In places the surface layer is lighter colored overwash.

Included with this soil in mapping are the very poorly drained Lyles and Montgomery and poorly drained Patton and Vincennes soils. These soils are in landscape positions similar to those of the Rensselaer soil. Lyles soils contain less clay in the subsoil than the Rensselaer soil, and Montgomery soils contain more clay. Included soils make up about 5 percent of the map unit.

The Rensselaer soil has a high available water capacity. Permeability is moderate. The organic matter content is moderate in the surface layer. Runoff is very slow. The water table is near or above the surface during winter and early spring.

Most areas of this soil are used for cultivated crops. Some are wooded, and a few are used for hay and pasture.

If drained, this soil is well suited to corn, soybeans, and winter wheat. The ponding is the main hazard. Subsurface drains, surface drains, and open ditches help to remove excess water. Cover crops and crop residue management improve tilth and increase the organic matter content. The soil is well suited to fall chiseling and to till-plant and ridge-plant cropping systems.

This soil is well suited to grasses and legumes for hay and pasture. It is better suited to grasses than to deep-

rooted legumes because of the seasonal high water table. Examples of suitable grasses are reed canarygrass and tall fescue, and an example of a suitable legume is ladino clover. The ponding is the main hazard. A drainage system is needed. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. The equipment limitation, seedling mortality, the windthrow hazard, and plant competition are management concerns. Equipment should be used only during dry periods or when the ground is frozen. Special site preparation, such as bedding, increases the seedling survival rate. Some replanting may be necessary. Protective borders or windbreaks on the windward side of the wooded tracts help to prevent windthrow. Windthrown trees should be removed periodically. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the ponding, this soil is generally unsuitable as a site for dwellings and sanitary facilities. It is severely limited as a site for local roads because of the ponding and frost action. Constructing the roads on raised, well compacted fill material, strengthening or replacing the base with better suited material, and providing adequate roadside ditches and culverts minimize the damage caused by ponding and frost action and improve the ability of the roads to support vehicular traffic.

The land capability classification is IIw. The woodland ordination symbol is 5W.

SbA—Skelton loam, 0 to 2 percent slopes. This nearly level, deep, well drained soil is on river terraces. Areas are irregular in shape and range from 5 to 60 acres in size. The dominant size is about 35 acres.

Typically, the surface layer is dark grayish brown loam about 11 inches thick. The subsoil is friable clay loam about 49 inches thick. It is yellowish brown in the upper part and dark yellowish brown in the lower part. The underlying material to a depth of about 70 inches is yellowish brown clay loam. In some places the surface layer is darker. In other places it is silt loam or sandy loam. In some areas the soil contains less sand in the control section. In other areas the underlying material is sand or loamy sand. In places the slope is more than 2 percent. In a few areas the content of gravel in the subsoil is as much as 15 percent.

Included with this soil in mapping are the somewhat poorly drained Crawleyville and poorly drained Vincennes soils in small depressions. Also included are sandy soils. Included soils make up about 5 percent of the map unit.

The Skelton soil has a high available water capacity. Permeability is moderate. The organic matter content is moderately low in the surface layer. Runoff is slow.

Most areas of this soil are used for cultivated crops. Some are wooded, and a few are used for hay and pasture.

This soil is well suited to corn, soybeans, and winter wheat. Cover crops and crop residue management help to maintain tilth and increase the organic matter content. The soil is well suited to till-plant and no-till cropping systems.

This soil is well suited to grasses and legumes for hay and pasture. Examples of suitable grasses are orchardgrass, timothy, and tall fescue, and examples of suitable legumes are alfalfa and red clover. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. No major hazards or limitations affect planting or harvesting.

Because of shrink-swell potential, this soil is moderately limited as a site for dwellings. Strengthening footings, foundations, and basement walls and backfilling with coarse textured material help to prevent the structural damage caused by shrinking and swelling.

Because of low strength and the shrink-swell potential, this soil is moderately limited as a site for local roads and streets. Constructing the roads and streets on raised, well compacted fill material, strengthening or replacing the base with better suited material, and providing adequate roadside ditches and culverts minimize the damage caused by low strength and by shrinking and swelling and improve the ability of the roads and streets to support vehicular traffic.

Because of the moderate permeability, this soil is moderately limited as a site for septic tank absorption fields. Enlarging the absorption area and controlling the rate of flow from a holding tank improve the ability of the field to absorb the effluent. Public disposal systems may be necessary.

The land capability classification is I. The woodland ordination symbol is 4A.

ScA—Skelton silt loam, 0 to 2 percent slopes, frequently flooded. This nearly level, deep, well drained soil is on low river terraces. It is frequently flooded during winter and early spring. Areas are irregular in shape and are 3 to more than 200 acres in size. The dominant size is about 60 acres.

Typically, the surface layer is brown silt loam about 9 inches thick. The subsoil is about 44 inches thick. It is yellowish brown, firm clay loam in the upper part and strong brown, friable sandy clay loam in the lower part. The underlying material to a depth of about 60 inches is strong brown sandy clay loam. In some places the

surface layer is darker. In other places the slope is more than 2 percent. In some areas the surface layer is silty overwash.

Included with this soil in mapping are the poorly drained Vincennes soils in the lower landscape positions. Also included are soils that are coarser textured in the underlying material than the Skelton soil. Included soils make up about 8 percent of the map unit.

The Skelton soil has a high available water capacity. Permeability is moderate. The organic matter content is moderately low in the surface layer. Runoff is slow.

Most areas of this soil are used for cultivated crops. Some are wooded, and a few are used for hay and pasture.

This soil is well suited to corn and soybeans. The flooding is the main hazard. It generally does not occur during the cropping season and only occasionally damages crops. Winter wheat may be damaged during winter and early spring. Levees can control the flooding, but they are extremely expensive if they are constructed to provide total protection. Cover crops and crop residue management improve tilth and increase the organic matter content. The soil is well suited to till-plant and no-till cropping systems.

This soil is well suited to grasses and legumes for hay and pasture. Examples of suitable grasses are orchardgrass and tall fescue, and examples of suitable legumes are red clover and ladino clover. The flooding is the main hazard. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. No major hazards or limitations affect planting or harvesting.

Because of the flooding, this soil is generally unsuitable as a site for dwellings and septic tank absorption fields and is severely limited as a site for local roads. Constructing the roads on raised, well compacted fill material and providing adequate roadside ditches and culverts minimize the damage caused by floodwater.

The land capability classification is IIw. The woodland ordination symbol is 4A.

Sf—Steff silt loam, frequently flooded. This nearly level, deep, moderately well drained soil is on bottom land. It is frequently flooded during winter and early spring. Areas are irregular in shape and are 3 to more than 40 acres in size. The dominant size is about 15 acres.

Typically, the surface layer is dark grayish brown silt loam about 9 inches thick. The subsoil is dark yellowish brown, mottled, friable silt loam about 32 inches thick. The underlying material to a depth of about 60 inches is light brownish gray, mottled silt loam. In some places no grayish mottles are within a depth of 30 inches. In other places the soil is less acid.

Included with this soil in mapping are the poorly drained Bonnie and somewhat poorly drained Stendal soils. These soils are in landscape positions similar to those of the Steff soil. They make up about 12 percent of the map unit.

The Steff soil has a high available water capacity. Permeability is moderate. The organic matter content is moderately low in the surface layer. Runoff is slow. The water table is at a depth of about 1.5 to 3.0 feet during winter and early spring.

Most areas are used for cultivated crops. Some are wooded, and a few are used for hay and pasture.

This soil is well suited to corn and soybeans. The flooding is the main hazard. It generally does not occur during the cropping season and only occasionally damages crops. Winter wheat may be damaged during winter and early spring. Levees can control the flooding, but they are extremely expensive if they are constructed to provide total protection. Cover crops and crop residue management improve tilth and increase the organic matter content. The soil is well suited to spring plowing, spring chiseling, and a no-till cropping system.

This soil is well suited to grasses and legumes for hay and pasture. Examples of suitable grasses are orchardgrass and tall fescue, and examples of suitable legumes are red clover and ladino clover. The flooding is the main hazard. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. Plant competition is severe. It can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the flooding, this soil is generally unsuitable as a site for dwellings and septic tank absorption fields. It is severely limited as a site for local roads because of the flooding and low strength. Constructing the roads on raised, well compacted fill material, strengthening or replacing the base with better suited material, and providing adequate roadside ditches and culverts minimize the damage caused by low strength and floodwater and improve the ability of the roads to support vehicular traffic.

The land capability classification is IIw. The woodland ordination symbol is 8A.

Sr—Stendal silt loam, frequently flooded. This nearly level, deep, somewhat poorly drained soil is on bottom land. It is frequently flooded during winter and early spring. Areas are irregular in shape and are 3 to more than 200 acres in size. The dominant size is about 40 acres.

Typically, the surface layer is brown silt loam about 10 inches thick. The subsoil is mottled, friable silt loam

about 27 inches thick. It is dark yellowish brown in the upper part and light gray in the lower part. The underlying material to a depth of about 60 inches is light brownish gray, mottled silt loam. In some places the soil is less acid. In other places loamy or sandy strata are below a depth of 40 inches.

Included with this soil in mapping are the moderately well drained Steff soils in the slightly higher landscape positions and the poorly drained Bonnie soils in the slightly lower positions. Included soils make up about 15 percent of the map unit.

The Stendal soil has a very high available water capacity. Permeability is moderate. The organic matter content is moderate in the surface layer. Runoff is slow. The water table is at a depth of about 1 to 3 feet during winter and early spring.

Most areas of this soil are used for cultivated crops. Some are wooded, and a few are used for hay and pasture.

This soil is well suited to corn and soybeans. The wetness is the main limitation, and the flooding is the main hazard. Subsurface drains, surface drains, and open ditches help to remove excess water. The flooding generally does not occur during the cropping season and only occasionally damages crops. Winter wheat may be damaged during winter and early spring. Levees can control the flooding, but they are extremely expensive if they are constructed to provide total protection. Cover crops and crop residue management improve tilth and increase the organic matter content. The soil is well suited to a ridge-plant cropping system.

This soil is well suited to grasses and legumes for hay and pasture. It is better suited to grasses than to deep-rooted legumes because of the seasonal high water table. Examples of suitable grasses are orchardgrass and tall fescue, and examples of suitable legumes are red clover and ladino clover. The flooding is the main hazard. A drainage system is needed. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. The equipment limitation and plant competition are the main management concerns. Equipment should be used only during dry periods or when the ground is frozen. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the flooding, this soil is generally unsuitable as a site for dwellings and septic tank absorption fields. It is severely limited as a site for local roads because of the flooding and frost action. Constructing the roads on raised, well compacted fill material, strengthening or replacing the base with better suited material, and providing adequate roadside ditches and culverts minimize the damage caused by floodwater and frost action and improve the ability of the roads to support vehicular traffic.

The land capability classification is IIw. The woodland ordination symbol is 5W.

SvC—Swanwick Variant silt loam, 1 to 15 percent slopes. This nearly level to strongly sloping, deep, well drained soil is in formerly mined areas on uplands. Areas are generally rectangular and are 40 to 200 acres in size. The dominant size is about 80 acres.

Typically, the surface layer is yellowish brown silt loam about 6 inches thick. The upper part of the underlying material is yellowish brown, firm, stratified silt loam and silty clay loam. The lower part to a depth of about 60 inches is dark gray extremely shaly silt loam. In places the underlying material is more acid.

Included with this soil in mapping are the moderately well drained Gudgel and well drained and moderately well drained Hosmer soils in undisturbed areas. Also included are soils that have rock fragments in the surface layer. Included soils make up about 8 percent of the map unit.

The Swanwick soil has a low available water capacity. Permeability is moderately slow. The organic matter content is low in the surface layer. Runoff is slow to rapid.

This soil is fairly well suited to cultivated crops. Water erosion and drought are the main hazards. Irrigation is needed during dry periods. Properly managing crop residue and adding organic material, such as animal waste, help to control erosion, improve the available water capacity, and conserve moisture. The soil is well suited to a no-till cropping system.

Nearly all areas are used for hay and pasture. This soil is well suited to grasses and legumes for hay and pasture. Overgazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to control water erosion and keep the pasture in good condition.

Because of the shrink-swell potential and the slope, this soil is moderately limited as a site for dwellings without basements. It is moderately limited as a site for dwellings with basements because of the slope. Strengthening foundations, footings, and basement walls and backfilling with coarse textured material help to prevent the structural damage caused by shrinking and swelling. Installing foundation drains and expansion joints also helps to prevent this damage. The buildings should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas. Retaining as much of the existing vegetation as possible during construction and revegetating disturbed areas as soon as possible help to control erosion.

Because of frost action, this soil is severely limited as a site for local roads. Properly designed roadside ditches

and culverts and a more stable base material, such as sand or gravel, help to overcome this limitation.

Because of the moderately slow permeability, this soil is severely limited as a site for septic tank absorption fields. Enlarging the absorption field helps to compensate for the restricted permeability. Alternative methods of sewage disposal should be considered.

The land capability classification is IIIs. No woodland ordination symbol is assigned.

SyB2—Sylvan silt loam, 2 to 6 percent slopes, eroded. This gently sloping, deep, well drained soil is on the tops of ridges in the uplands. Areas are irregular in shape and are 3 to 80 acres in size. The dominant size is about 10 acres.

Typically, the surface layer is mixed brown and yellowish brown silt loam about 6 inches thick. The subsoil is yellowish brown, friable silt loam about 20 inches thick. The underlying material to a depth of about 60 inches is light brownish gray, mottled silt loam. In some places the soil is deeper to carbonates. In other places the slope is less than 2 or more than 6 percent.

Included with this soil in mapping are severely eroded areas. These areas make up about 5 percent of the map unit.

The Sylvan soil has a very high available water capacity. Permeability is moderate. The organic matter content is moderately low in the surface layer. Runoff is rapid.

Most areas of this soil are used for cultivated crops. Some are wooded. A few are used for hay and pasture.

This soil is well suited to corn, soybeans, and winter wheat. Water erosion is the main hazard. It can be controlled by a crop rotation that includes grasses and legumes and by terraces, water- and sediment-control basins, grassed waterways, a system of conservation tillage that leaves all or part of the crop residue on the surface, grade stabilization structures, and cover crops. The soil is well suited to till-plant and no-till cropping systems. Crop residue management and cover crops improve soil structure and tilth and increase the organic matter content.

This soil is well suited to grasses and legumes for hay and pasture. Examples of suitable grasses are orchardgrass, timothy, and tall fescue, and examples of suitable legumes are alfalfa and red clover. Water erosion is the main hazard. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to control water erosion and keep the pasture in good condition.

This soil is well suited to trees. Plant competition is moderate. It can be controlled by proper site preparation and by spraying, cutting, or girdling.

This soil is suitable as a site for septic tank absorption fields and for dwellings with basements. It is moderately limited as a site for dwellings without basements because of the shrink-swell potential. Strengthening foundations, footings, and basement walls, backfilling with coarse textured material, and installing foundation drains and expansion joints help to prevent the structural damage caused by shrinking and swelling.

Because of low strength and frost action, this soil is severely limited as a site for local roads and streets. Constructing the roads and streets on raised, well compacted fill material and strengthening or replacing the base with better suited material minimize the damage caused by low strength and frost action and improve the ability of the roads and streets to support vehicular traffic.

The land capability classification is IIe. The woodland ordination symbol is 6A.

SyC3—Sylvan silt loam, 6 to 12 percent slopes, severely eroded. This moderately sloping, deep, well drained soil is on side slopes and ridgetops in the uplands. Areas are irregular in shape and are 5 to 25 acres in size. The dominant size is about 10 acres.

Typically, the surface layer is mixed yellowish brown and brown silt loam about 6 inches thick. In most areas, nearly all of the original darkened surface layer has been removed by erosion and tillage has mixed the rest with the upper part of the subsoil. The subsoil is yellowish brown, friable silt loam about 11 inches thick. The underlying material to a depth of about 60 inches is light gray, mottled, calcareous silt. In some places the soil is deeper to the calcareous underlying material. In other places the calcareous material is at or near the surface. In some areas the slope is less than 6 or more than 12 percent.

Included with this soil in mapping are uneroded areas. These areas make up about 8 percent of the map unit.

The Sylvan soil has a very high available water capacity. Permeability is moderate. The organic matter content is low in the surface layer. Runoff is rapid.

Most areas of this soil are used for cultivated crops. Some are used for hay and pasture, and a few are wooded.

This soil is poorly suited to corn, soybeans, and small grain. Water erosion is the main hazard. It can be controlled by a crop rotation that includes grasses and legumes and by terraces, water- and sediment-control basins, grassed waterways, a system of conservation tillage that leaves all or part of the crop residue on the surface, grade stabilization structures, and cover crops. The soil is well suited to till-plant and no-till cropping systems. Crop residue management and cover crops improve soil structure and tilth and increase the organic matter content.

This soil is well suited to grasses and legumes for hay and pasture. Examples of suitable grasses are orchardgrass, timothy, and tall fescue, and examples of suitable legumes are alfalfa and red clover. Water

erosion is the main hazard. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to control water erosion and keep the pasture in good condition.

This soil is well suited to trees. Plant competition is moderate. It can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the slope, this soil is moderately limited as a site for dwellings with basements. It is moderately limited as a site for dwellings without basements because of the shrink-swell potential and the slope. Land shaping is necessary in some areas. The buildings should be designed so that they conform to the natural slope of the land. Strengthening foundations, footings, and basement walls, backfilling with coarse textured material, and installing foundation drains and expansion joints help to prevent the structural damage caused by shrinking and swelling. Retaining as much of the existing vegetation as possible during construction and revegetating disturbed areas as soon as possible help to control erosion.

Because of low strength and frost action, this soil is severely limited as a site for local roads and streets. Constructing the roads and streets on raised, well compacted fill material and providing adequate roadside ditches and culverts minimize the damage caused by low strength and frost action and improve the ability of the roads and streets to support vehicular traffic.

Because of the slope, this soil is moderately limited as a site for septic tank absorption fields. Installing the absorption field on the contour helps to overcome this limitation. Alternative methods of sewage disposal should be considered. Public disposal systems may be needed.

The land capability classification is IVe. The woodland ordination symbol is 6A.

SyD—Sylvan silt loam, 12 to 18 percent slopes. This strongly sloping, deep, well drained soil is on side slopes in the uplands. Areas are generally irregular in shape and are 5 to 30 acres in size. The dominant size is about 10 acres.

Typically, the surface layer is dark grayish brown silt loam about 4 inches thick. The subsurface layer is about 3 inches of yellowish brown silt loam. The subsoil is yellowish brown, friable silt loam about 20 inches thick. The underlying material to a depth of about 60 inches is light brownish gray silt loam. In places the slope is less than 12 or more than 18 percent.

Included with this soil in mapping are severely eroded areas. These areas make up about 5 percent of the map unit.

The Sylvan soil has a very high available water capacity. Permeability is moderate. The organic matter content is moderately low in the surface layer. Runoff is very rapid.

Most areas of this soil are used as woodland. Some are used for hay and pasture. A few are cultivated.

This soil is poorly suited to corn, soybeans, and small grain. Water erosion is the main hazard. It can be controlled by a crop rotation that includes grasses and legumes and by terraces, grassed waterways, a system of conservation tillage that leaves all or part of the crop residue on the surface, grade stabilization structures, and cover crops. The soil is well suited to till-plant and no-till cropping systems. Crop residue management and cover crops help to maintain soil structure and tilth and increase the organic matter content.

This soil is well suited to grasses and legumes for hay and pasture. Examples of suitable grasses are orchardgrass, timothy, and tall fescue, and examples of suitable legumes are alfalfa and red clover. Water erosion is a hazard. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to control water erosion and keep the pasture in good condition.

This soil is well suited to trees. The erosion hazard, the equipment limitation, seedling mortality, and plant competition are management concerns. Because of the erosion hazard, logging roads, skid trails, and landings should be established on gentle grades and water should be removed by water bars, culverts, and drop structures. During wet periods, the roads tend to be slippery and ruts form readily. The use of planting or logging equipment is limited during wet periods. Special site preparation, such as furrowing before planting, reduces the seedling mortality rate. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the slope, this soil is severely limited as a site for dwellings. Land shaping is necessary in some areas. The buildings should be designed so that they conform to the natural slope of the land. Retaining as much of the existing vegetation as possible during construction and revegetating disturbed areas as soon as possible help to control erosion.

Because of the slope, low strength, and frost action, this soil is severely limited as a site for local roads and streets. Constructing the roads and streets on raised, well compacted fill material, strengthening or replacing the base with better suited material, and providing adequate roadside ditches and culverts minimize the damage caused by low strength and frost action and improve the ability of the roads and streets to support vehicular traffic. Building on the contour and land shaping help to overcome the slope.

Because of the slope, this soil is severely limited as a site for septic tank absorption fields. Constructing the absorption field on the contour and land shaping help to

overcome this limitation. Public disposal systems generally are necessary.

The land capability classification is IVe. The woodland ordination symbol is 6R.

SyF—Sylvan silt loam, 18 to 50 percent slopes. This moderately steep to very steep, deep, well drained soil is on side slopes in the uplands. Areas are irregular in shape and are 5 to 100 acres in size. The dominant size is about 30 acres.

Typically, the surface layer is dark grayish brown silt loam about 3 inches thick. The subsoil is friable silt loam about 19 inches thick. It is yellowish brown in the upper part and strong brown in the lower part. The underlying material to a depth of about 60 inches is light brownish gray, mottled silt loam. In some places the solum is thinner. In other places the soil is deeper to calcareous material. In some areas the slope is less than 18 percent.

Included with this soil in mapping are the somewhat excessively drained Bloomfield soils. These soils are in landscape positions similar to those of the Sylvan soil. Also included are severely eroded areas; rock outcrops; and, along drainageways, soils that are wetter than the Sylvan soil. Included areas make up about 5 percent of the map unit.

The Sylvan soil has a very high available water capacity. Permeability is moderate. The organic matter content is moderately low in the surface layer. Runoff is very rapid.

Most areas are used as woodland. A few are used for hay and pasture. This soil is generally unsuitable for cultivated crops. The slope limits the use of farm equipment. The hazard of water erosion is severe.

This soil is poorly suited to grasses and legumes for pasture and is generally unsuitable for hay. Water erosion is the main hazard. The slope limits the use of pasture renovation equipment. Special management is needed to establish and maintain desirable grasses, such as orchardgrass, timothy, and tall fescue, and desirable legumes, such as alfalfa and red clover. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to control water erosion and keep the pasture in good condition.

This soil is well suited to trees. The erosion hazard, the equipment limitation, seedling mortality, and plant competition are management concerns. Logging roads and skid trails should be built on the gentler slopes or on the contour. Special harvesting equipment may be needed. Because of the seedling mortality rate, some replanting may be necessary. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the slope, this soil is generally unsuitable as a site for dwellings and septic tank absorption fields. It is severely limited as a site for local roads because of the slope, low strength, and frost action. Constructing the roads on raised, well compacted fill material, strengthening or replacing the base with better suited material, and providing adequate roadside ditches and culverts minimize the damage caused by low strength and frost action. Constructing the roads on the contour and land shaping help to overcome the slope.

The land capability classification is VIIe. The woodland ordination symbol is 6R.

TaD3—Taftown silt loam, 12 to 18 percent slopes, severely eroded. This strongly sloping, deep, well drained soil is on side slopes in the uplands. Areas are irregular in shape and are 3 to 20 acres in size. The dominant size is about 10 acres.

Typically, the surface layer is mixed yellowish brown and dark brown silt loam about 3 inches thick. In most areas, nearly all of the original darkened surface layer has been removed by erosion and tillage has mixed the rest with the upper part of the subsoil. The subsoil is about 38 inches thick. It is yellowish brown. The upper part is friable silt loam, and the lower part is firm loam. Soft, weathered sandstone and shale bedrock is at a depth of about 41 inches. In places the slope is less than 12 or more than 18 percent.

Included with this soil in mapping are the well drained Hosmer and Gudgel soils on the upper part of the slopes and the well drained Gilpin Variant soils on toe slopes. Hosmer and Gudgel soils have a fragipan. Gilpin Variant soils are shallower over sandstone and shale than the Taftown soil. Also included are rock outcrops. Included areas make up about 8 percent of the map unit.

The Taftown soil has a moderate available water capacity. Permeability also is moderate. The organic matter content is moderately low in the surface layer. Runoff is very rapid.

Most areas are used for hay and pasture. Some are wooded, and a few are used for cultivated crops. Mainly because of the hazard of water erosion, this soil is generally unsuitable for cultivated crops, is poorly suited to grasses and legumes for hay, and is only fairly well suited to pasture. Examples of suitable grasses are orchardgrass, timothy, and tall fescue, and examples of suitable legumes are alfalfa and red clover. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to control water erosion and keep the pasture in good condition.

This soil is well suited to trees. The erosion hazard and the equipment limitation are the main management concerns. Logging roads and skid trails should be built on the gentler slopes or on the contour. Special harvesting equipment may be needed.

Because of the slope, this soil is severely limited as a site for dwellings and septic tank absorption fields. Land

shaping is necessary in some areas. The buildings should be designed so that they conform to the natural slope of the land. The absorption fields should be installed on the contour. Retaining as much of the existing vegetation as possible during construction and revegetating disturbed areas as soon as possible help to control erosion.

Because of the slope and frost action, this soil is severely limited as a site for local roads and streets. Replacing or covering the upper soil layers with suitable base material helps to prevent the damage caused by frost action. Constructing the roads and streets on the contour and land shaping help to overcome the slope.

The land capability classification is VIe. The woodland ordination symbol is 4R.

TaE—Taftown silt loam, 18 to 25 percent slopes. This moderately steep, deep, well drained soil is on side slopes in the uplands. Areas are irregular in shape and range from 5 to 60 acres in size. The dominant size is about 15 acres.

Typically, the surface layer is dark brown silt loam about 4 inches thick. The subsurface layer is yellowish brown silt loam about 5 inches thick. The subsoil is about 55 inches of silt loam and loam. The upper part is yellowish brown and friable, and the lower part is yellowish brown and strong brown and is firm. Soft sandstone and shale bedrock is at a depth of about 64 inches. In places the slope is less than 18 or more than 25 percent.

Included with this soil in mapping are the well drained Alford soils on the upper part of the slopes and the well drained Gilpin Variant soils on toe slopes. Also included are severely eroded areas, areas of rock outcrop, gullies, and narrow areas of alluvium along drainageways. Included areas make up about 10 percent of the map unit.

The Taftown soil has a high available water capacity. Permeability is moderate. The organic matter content is moderately low in the surface layer. Runoff is very rapid.

Most areas are used as woodland. Some are used for hay and pasture. This soil is generally unsuited to cultivated crops. The slope limits the use of equipment, and the hazard of water erosion is severe.

This soil is poorly suited to grasses and legumes for hay and is fairly well suited to pasture. Examples of suitable grasses are orchardgrass, timothy, and tall fescue, and examples of suitable legumes are alfalfa and red clover. The slope is the main limitation, and water erosion is the main hazard. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to control water erosion and keep the pasture in good condition.

Many areas support native hardwoods. This soil is well suited to trees. The erosion hazard and the equipment limitation are the main management concerns. Logging roads and skid trails should be built on the gentler slopes or on the contour. Special harvesting equipment may be needed.

Because of the slope, this soil is generally unsuitable as a site for dwellings and septic tank absorption fields. It is severely limited as a site for local roads because of the slope and frost action. The roads should be built on the contour as much as possible. Properly designed roadside ditches and culverts and a more stable base material, such as sand or gravel, help to prevent the damage caused by frost action.

The land capability classification is VIe. The woodland ordination symbol is 4R.

Ud—Udorthents, cut and filled. This map unit consists of highway interchanges, industrial sites, and other urban areas where the original soil material has been cut or filled. Areas are 3 to more than 200 acres in size.

The soil material is a mixture of surface soil, subsoil, and underlying material. It generally is firmly compacted. The vegetation commonly is introduced grasses planted for erosion control and for esthetic effect. Because of a wide range in chemical and physical soil properties, onsite investigation is needed if alternative land uses are considered.

No land capability classification or woodland ordination symbol is assigned.

UmD3—Udorthents-Sylvan complex, 12 to 18 percent slopes, severely eroded. This map unit consists of strongly sloping, deep, well drained soils and areas of calcareous loess exposed by erosion on upland side slopes. Areas are irregular in shape and are 10 to 40 acres in size. The dominant size is about 20 acres. The areas are 45 to 60 percent Udorthents and 35 to 50 percent Sylvan soil. The Udorthents and the Sylvan soil occur as areas so intricately intermingled that mapping them separately is not practical.

Typically, the Udorthents have a surface layer of yellowish brown silt about 3 inches thick. The underlying material to a depth of about 60 inches is mottled silt. It is yellowish brown in the upper part and light brownish gray in the lower part.

Typically, Sylvan soil has a surface layer of yellowish brown silt loam about 4 inches thick. The subsoil is friable silt loam about 20 inches thick. The upper part is yellowish brown, and the lower part is brownish yellow. The underlying material to a depth of about 60 inches is light gray, mottled silt loam. In places the slope is less than 12 or more than 18 percent.

Included with these soils in mapping are alluvial soils along small drainageways. These included soils make up about 5 percent of the map unit.

The Sylvan soil and the Udorthents have a high available water capacity. Permeability is moderate. The

organic matter content is low in the surface layer. Runoff is very rapid.

Most areas are used for cultivated crops or for hay and pasture. A few are used as woodland. Mainly because of the hazard of water erosion, these soils are generally unsuitable for cultivated crops, are poorly suited to grasses and legumes for hay, and are only fairly well suited to pasture. Examples of suitable grasses are orchardgrass, timothy, and tall fescue, and examples of suitable legumes are alfalfa and red clover. Overgrazing or grazing when the soils are wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

These soils are well suited to trees. The erosion hazard, the equipment limitation, seedling mortality, and plant competition are management concerns. Because of the erosion hazard, logging roads, skid trails, and landings should be established on the gentler slopes and water should be removed by water bars, culverts, and drop structures. During wet periods, the roads tend to be slippery and ruts form readily. The use of planting or logging equipment is limited during wet periods. Special site preparation, such as furrowing before planting, reduces the seedling mortality rate. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the slope, the Sylvan soil is severely limited as a site for dwellings. Land shaping is necessary in some areas. The buildings should be designed so that they conform to the natural slope of the land. Retaining as much of the existing vegetation as possible during construction and revegetating disturbed areas as soon as possible help to control erosion.

Because of the slope, low strength, and frost action, the Sylvan soil is severely limited as a site for local streets and roads. Constructing the roads and streets on raised, well compacted fill material, strengthening or replacing the base with better suited material, and providing adequate side ditches and culverts minimize the damage caused by low strength and frost action and improve the ability of the roads and streets to support vehicular traffic. Building on the contour and land shaping help to overcome the slope.

Because of the slope, the Sylvan soil is severely limited as a site for septic tank absorption fields. Installing the absorption field on the contour helps to overcome this limitation. Public disposal systems generally are needed.

The land capability classification is VIe. The woodland ordination symbol is 6R.

UnA—Uniontown silt loam, 0 to 2 percent slopes. This nearly level, deep, moderately well drained soil is on lacustrine terraces. Areas are irregular in shape and are 3 to 70 acres in size. The dominant size is about 10 acres.

Typically, the surface layer is brown silt loam about 11 inches thick. The subsurface layer is about 6 inches of light yellowish brown silt loam. The subsoil is yellowish brown, mottled, friable silt loam about 25 inches thick. The underlying material to a depth of about 60 inches is light brownish gray, mottled silt loam.

Included with this soil in mapping are the somewhat poorly drained Reesville soils in the slightly lower landscape positions and the poorly drained Evansville and very poorly drained Ragsdale soils in the lower positions and in depressions. Included soils make up about 5 percent of the map unit.

The Uniontown soil has a very high available water capacity. Permeability is moderate in the upper part of the soil and moderately slow in the underlying material. The organic matter content is moderately low in the surface layer. Runoff is slow. The water table is at a depth of about 2.5 to 4.0 feet during winter and early spring.

Most areas of this soil are used for cultivated crops. Some are wooded, and a few are used for hay and pasture.

This soil is well suited to corn, soybeans, and winter wheat. No major hazards or limitations affect cropping. The soil is well suited to till-plant and no-till cropping systems.

This soil is well suited to grasses and legumes for hay and pasture. Examples of suitable grasses are orchardgrass and tall fescue, and examples of suitable legumes are alfalfa and red clover. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. Plant competition is severe. It can be controlled by proper site preparation and by spraying, cutting, or girdling.

This soil is suitable as a site for dwellings without basements. It is moderately limited as a site for dwellings with basements because of the wetness. Properly sealing the walls and backfilling around footing drains with sand help to overcome this limitation.

Because of low strength and frost action, this soil is severely limited as a site for local roads and streets. Constructing the roads and streets on raised, well compacted fill material, strengthening or replacing the base with better suited material, and providing adequate roadside ditches and culverts minimize the damage caused by low strength and frost action and improve the ability of the roads and streets to support vehicular traffic.

Because of the wetness, this soil is severely limited as a site for septic tank absorption fields. Installing interceptor drains around the absorption field lowers the

water table. Alternative methods of sewage disposal should be considered. Public disposal systems may be needed.

The land capability classification is I. The woodland ordination symbol is 6A.

UnB2—Uniontown silt loam, 2 to 6 percent slopes, eroded. This gently sloping, deep, well drained soil is on lacustrine terraces. Areas are generally irregular in shape and are 5 to 100 acres in size. The dominant size is about 25 acres.

Typically, the surface layer is about 9 inches of mixed brown silt loam and yellowish brown silty clay loam. The subsoil is about 30 inches of yellowish brown, friable silty clay loam and silt loam. The underlying material to a depth of about 60 inches is yellowish brown, mottled silt loam. In places the slope is less than 2 or more than 6 percent.

Included with this soil in mapping are the somewhat poorly drained Reesville soils in the slightly lower landscape positions and the very poorly drained Ragsdale and poorly drained Evansville soils in slight depressions. Also included are severely eroded areas. Included soils make up about 5 percent of the map unit.

The Uniontown soil has a very high available water capacity. Permeability is moderate in the upper part of the soil and moderate or moderately slow in the underlying material. The organic matter content is moderately low in the surface layer. Runoff is rapid. The water table is at a depth of about 2.5 to 6.0 feet during winter and early spring.

Most areas of this soil are used for cultivated crops. Some are used for hay and pasture, and a few are wooded.

This soil is well suited to corn, soybeans, and winter wheat. Water erosion is the main hazard. It can be controlled by a crop rotation that includes grasses and legumes and by terraces, water- and sediment-control basins, grassed waterways, a system of conservation tillage that leaves all or part of the crop residue on the surface, grade stabilization structures, and cover crops. The soil is well suited to till-plant and no-till cropping systems. Crop residue management and cover crops improve soil structure and tilth and increase the organic matter content.

This soil is well suited to grasses and legumes for hay and pasture. Examples of suitable grasses are orchardgrass and tall fescue, and examples of suitable legumes are alfalfa and red clover. Water erosion is the main hazard. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to control water erosion and keep the pasture in good condition.

This soil is well suited to trees. Plant competition is moderate. It can be controlled by proper site preparation and by spraying, cutting, or girdling.

This soil is suitable as a site for dwellings without basements. It is moderately limited as a site for dwellings with basements because of the wetness. Properly sealing the walls and backfilling around footing drains with sand help to overcome this limitation.

Because of low strength and frost action, this soil is severely limited as a site for local roads and streets. Constructing the roads and streets on raised, well compacted fill material, strengthening or replacing the base with better suited material, and providing adequate roadside ditches and culverts minimize the damage caused by low strength and frost action and improve the ability of the roads and streets to support vehicular traffic.

Because of the wetness and the moderately slow permeability, this soil is severely limited as a site for septic tank absorption fields. Installing interceptor drains around the absorption field lowers the water table. Enlarging the absorption area helps to compensate for the restricted permeability. Alternative methods of sewage disposal should be considered. Public disposal systems may be needed.

The land capability classification is IIe. The woodland ordination symbol is 6A.

UnB3—Uniontown silt loam, 2 to 6 percent slopes, severely eroded. This gently sloping, deep, well drained soil is on high lacustrine terraces. Areas are irregular in shape and are 3 to 15 acres in size. The dominant size is about 10 acres.

Typically, the surface layer is mixed yellowish brown and brown silt loam about 8 inches thick. In most areas, nearly all of the original darkened surface layer has been removed by erosion and tillage has mixed the rest with the upper part of the subsoil. The subsoil is yellowish brown, friable silt loam about 22 inches thick. It is mottled in the lower part. The underlying material to a depth of about 60 inches is light gray, mottled silt loam. In places the slope is more than 6 percent.

Included with this soil in mapping are the somewhat poorly drained Reesville soils in the slightly lower landscape positions and the very poorly drained Ragsdale and poorly drained Evansville soils in depressions. Also included are uneroded areas. Included soils make up about 10 percent of the map unit.

The Uniontown soil has a high available water capacity. Permeability is moderate in the upper part of the soil and moderate or moderately slow in the underlying material. The organic matter content is low in the surface layer. Runoff is rapid. The water table is at a depth of about 2.5 to 6.0 feet during winter and early spring.

Most areas of this soil are used for cultivated crops. Some are used for hay and pasture or for wildlife habitat.

This soil is fairly well suited to corn, soybeans, and winter wheat. Water erosion is the main hazard. It can be controlled by a crop rotation that includes grasses and legumes and by terraces, water- and sediment-control basins, grassed waterways, a system of conservation tillage that leaves all or part of the crop residue on the surface, grade stabilization structures, and cover crops. The soil is well suited to till-plant and no-till cropping systems. Crop residue management and cover crops improve soil structure and tilth and increase the organic matter content.

This soil is well suited to grasses and legumes for hay and pasture. Examples of suitable grasses are orchardgrass and tall fescue, and examples of suitable legumes are alfalfa and red clover. Water erosion is the main hazard. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to control water erosion and keep the pasture in good condition.

This soil is well suited to trees. Plant competition is moderate. It can be controlled by proper site preparation and by spraying, cutting, or girdling.

This soil is suitable as a site for dwellings without basements. It is moderately limited as a site for dwellings with basements because of the wetness. Subsurface drains help to lower the water table. Footing drains and sump pumps may be needed. Properly sealing the walls and backfilling around the footing drains with sand also reduce the wetness.

Because of low strength and frost action, this soil is severely limited as a site for local roads and streets. Constructing the roads and streets on raised, well compacted fill material, strengthening or replacing the base with better suited material, and providing adequate roadside ditches and culverts minimize the damage caused by low strength and frost action and improve the ability of the roads and streets to support vehicular traffic.

Because of the wetness and the moderately slow permeability, this soil is severely limited as a site for septic tank absorption fields. Installing interceptor drains around the absorption field lowers the water table. Enlarging the absorption area helps to compensate for the restricted permeability. Alternative methods of sewage disposal should be considered. Public disposal systems generally are needed.

The land capability classification is IIIe. The woodland ordination symbol is 4A.

UnC3—Uniontown silt loam, 6 to 12 percent slopes, severely eroded. This moderately sloping, deep, well drained soil is on high lacustrine terraces. Areas are irregular in shape and are 3 to 20 acres in size. The dominant size is about 10 acres.

Typically, the surface layer is mixed yellowish brown and brown silt loam about 5 inches thick. In most areas, nearly all of the original darkened surface layer has been removed by erosion and tillage has mixed the rest with the upper part of the subsoil. The subsoil is yellowish brown, friable silt loam about 30 inches thick. It is mottled in the lower part. The underlying material to a depth of about 60 inches is light gray, mottled silt loam. In places the slope is less than 6 percent.

Included with this soil in mapping are uneroded areas. These areas make up about 5 percent of the map unit.

The Uniontown soil has a high available water capacity. Permeability is moderate in the upper part of the soil and moderate or moderately slow in the underlying material. The organic matter content is low in the surface layer. Runoff is rapid. The water table is at a depth of about 2.5 to 6.0 feet during winter and early spring.

Most areas are used for cultivated crops. This soil is poorly suited to corn, soybeans, and winter wheat. Water erosion is the main hazard. It can be controlled by a crop rotation that includes grasses and legumes and by terraces, water- and sediment-control basins, grassed waterways, a system of conservation tillage that leaves all or part of the crop residue on the surface, grade stabilization structures, and cover crops. The soil is well suited to till-plant and no-till cropping systems. Crop residue management and cover crops improve soil structure and tilth and increase the organic matter content.

This soil is well suited to grasses and legumes for hay and pasture. Examples of suitable grasses are orchardgrass and tall fescue, and examples of suitable legumes are alfalfa and red clover. Water erosion is the main hazard. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to control water erosion and keep the pasture in good condition.

This soil is well suited to trees. Plant competition is moderate. It can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the wetness and the slope, this soil is moderately limited as a site for dwellings with basements. It is moderately limited as a site for dwellings without basements because of the slope. Subsurface drains help to lower the water table. Footing drains and sump pumps may be needed. Properly sealing the walls and backfilling around the footing drains with sand also reduce the wetness. Land shaping is necessary in some areas. The buildings should be designed so that they conform to the natural slope of the land.

Because of low strength and frost action, this soil is severely limited as a site for local roads and streets. Constructing the roads and streets on raised, well compacted fill material, strengthening or replacing the

base with better suited material, and providing adequate roadside ditches and culverts minimize the damage caused by low strength and frost action and improve the ability of the roads and streets to support vehicular traffic.

Because of the wetness and the moderately slow permeability, this soil is severely limited as a site for septic tank absorption fields. Installing interceptor drains around the absorption field lowers the water table. Enlarging the absorption area helps to compensate for the restricted permeability. The absorption field should be installed on the contour. Alternative methods of sewage disposal should be considered. Public disposal systems may be needed.

The land capability classification is IVe. The woodland ordination symbol is 4A.

Vn—Vincennes loam. This nearly level, deep, poorly drained soil is on river terraces. It is subject to ponding. Areas are irregular in shape and are 10 to more than 1,000 acres in size. The dominant size is about 500 acres.

Typically, the surface layer is dark grayish brown loam about 10 inches thick. The subsurface layer is about 5 inches of light brownish gray, mottled loam. The subsoil is light gray and light brownish gray, mottled, firm and friable clay loam about 34 inches thick. The underlying material to a depth of about 60 inches is gray, mottled clay loam. In some places the surface layer is darker. In other places the soil has less sand. In a few places it is less acid. In some areas the surface layer is sandy loam. In a few areas the underlying material has strata of sand, clay, gravelly sandy loam, or gravelly sandy clay loam.

Included with this soil in mapping are the very poorly drained Rensselaer and Zipp soils. These soils are in landscape positions similar to those of the Vincennes soil. Also included are the somewhat poorly drained Crawleyville and well drained Skelton soils in the slightly higher positions. Included soils make up about 5 percent of the map unit.

The Vincennes soil has a high available water capacity. Permeability is slow. The organic matter content is moderate in the surface layer. Runoff is slow. The water table is near or above the surface during winter and early spring (fig. 6).

Most areas of this soil are used for cultivated crops. Some are wooded, and a few are pastured.

This soil is well suited to corn, soybeans, and winter wheat. The ponding is the main hazard. Subsurface drains, surface drains, and open ditches help to remove excess water. Cover crops and crop residue management help to maintain tilth and the organic matter content. The soil is well suited to fall chiseling and to till-plant and ridge-plant cropping systems.

This soil is well suited to grasses and legumes for hay and pasture. It is better suited to grasses than to deep-rooted legumes because of the seasonal high water table. Examples of suitable grasses are orchardgrass, reed canarygrass, and tall fescue. The ponding is the main hazard. A drainage system is needed. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. The equipment limitation, seedling mortality, the windthrow hazard, and plant competition are management concerns. Equipment should be used only during dry periods or when the ground is frozen. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling. Special site preparation, such as bedding, increases the seedling survival rate. Harvest methods that do not isolate the remaining trees or leave them widely spaced reduce the windthrow hazard.

Because of the ponding, this soil is generally unsuitable as a site for dwellings and sanitary facilities. It is severely limited as a site for local roads because of the ponding, low strength, and frost action. Constructing the roads on raised, well compacted fill material, strengthening or replacing the base with better suited material, and providing adequate roadside ditches and culverts minimize the damage caused by ponding, low strength, and frost action and improve the ability of the roads to support vehicular traffic.

The land capability classification is IIw. The woodland ordination symbol is 5W.

Vo—Vincennes silt loam, frequently flooded. This nearly level, deep, poorly drained soil is on low river terraces and on bottom land. It is frequently flooded in winter and spring and is subject to ponding. Areas are irregular in shape and are 3 to more than 1,000 acres in size. The dominant size is about 500 acres.

Typically, the surface layer is dark grayish brown silt loam about 9 inches thick. The subsurface layer also is dark grayish brown silt loam about 9 inches thick. The subsoil is gray, mottled, firm and friable clay loam about 47 inches thick. The underlying material to a depth of about 80 inches is gray, mottled clay loam. In some places the surface layer is darker. In other places the soil has less sand. In a few places the surface layer is loam or sandy loam. In some areas the soil is less acid. In a few areas the underlying material has strata of sand, clay, gravelly sandy loam, or gravelly sandy clay loam. In places the soil is only occasionally flooded.

Included with this soil in mapping are the well drained Elkinsville and Skelton soils in the slightly higher landscape positions. Also included are the very poorly drained Zipp soils in depressions. Included soils make up about 8 percent of the map unit.

The Vincennes soil has a high available water capacity. Permeability is slow. The organic matter content is moderate in the surface layer. Runoff is slow.

Figure 6.—A seasonal high water table about 1 foot from the surface of Vincennes loam.

The water table is near or above the surface during winter and early spring.

Most areas of this soil are used for cultivated crops. Some are wooded, and a few are used for hay and pasture.

This soil is well suited to corn and soybeans. Winter wheat can be damaged by flooding or ponding in winter and early spring. The flooding and the ponding are the main hazards. Subsurface drains, surface drains, and open ditches help to remove excess water. The flooding generally does not occur during the cropping season and

only occasionally damages crops. Levees can control the flooding, but they are extremely expensive if they are constructed to provide total protection. Cover crops and crop residue management improve tilth and increase the organic matter content. The soil is well suited to fall chiseling and to till-plant and ridge-plant cropping systems.

This soil is well suited to grasses and legumes for hay and pasture. It is better suited to grasses than to deep-rooted legumes because of the seasonal high water table. Examples of suitable grasses are reed canarygrass and tall fescue, and an example of a suitable legume is ladino clover. The flooding and the ponding are the main hazards. A drainage system is needed. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. The equipment limitation, seedling mortality, the windthrow hazard, and plant competition are management concerns. Equipment should be used only during dry periods or when the ground is frozen. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling. Special site preparation, such as bedding, increases the seedling survival rate. Some replanting may be necessary. Protective borders or windbreaks on the windward side of the wooded tracts help to prevent windthrow. Windthrown trees should be removed periodically.

Because of the ponding and the flooding, this soil is generally unsuitable as a site for dwellings and sanitary facilities. It is severely limited as a site for local roads because of the flooding, the ponding, and frost action. Constructing the roads on raised, well compacted fill material, strengthening or replacing the base with better suited material, and providing adequate roadside ditches and culverts minimize the damage caused by flooding, ponding, and frost action and improve the ability of the roads to support vehicular traffic.

The land capability classification is IIw. The woodland ordination symbol is 5W.

Wa—Wakeland silt loam, frequently flooded. This nearly level, deep, somewhat poorly drained soil is on bottom land. It is frequently flooded during winter and spring. Areas are irregular in shape or are long and narrow. They are 5 to 20 acres in size. The dominant size is about 15 acres.

Typically, the surface layer is brown silt loam about 6 inches thick. The underlying material to a depth of about 65 inches is mottled, friable silt loam. It is brown and grayish brown in the upper part and light brownish gray in the lower part. In some areas the soil has strata of sandy or loamy material. In a few places the surface layer is loam, sandy loam, or loamy sand.

Included with this soil in mapping are the poorly drained Birds soils in the slightly lower landscape positions and the well drained Haymond and moderately well drained Wilbur soils in the slightly higher positions. Also included are sandy soils and gravel bars. Included soils make up about 15 percent of the map unit.

The Wakeland soil has a very high available water capacity. Permeability is moderate. The organic matter content is moderately low in the surface layer. Runoff is slow. The water table is at a depth of 1 to 3 feet during winter and early spring.

Most areas of this soil are used for cultivated crops. Some are used for hay, pasture, or woodland.

If drained, this soil is well suited to corn and soybeans. It is not so well suited to winter wheat because of the flooding. The wetness is the main limitation. Subsurface drains, surface drains, and open ditches help to remove excess water. Crop residue management and cover crops improve tilth and increase the organic matter content. The soil is well suited to a ridge-plant cropping system.

This soil is well suited to grasses and legumes for hay and pasture. It is better suited to grasses than to deep-rooted legumes because of the seasonal high water table. Examples of suitable grasses are orchardgrass and tall fescue, and examples of suitable legumes are ladino clover and red clover. The wetness is the main limitation, and the flooding is the main hazard. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. Plant competition is moderate. Seedlings survive and grow well if competing vegetation is controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the flooding, this soil is generally unsuitable as a site for dwellings and septic tank absorption fields. It is severely limited as a site for local roads because of the flooding and frost action. Constructing the roads on raised, well compacted fill material, strengthening or replacing the base with better suited material, and providing adequate roadside ditches and culverts minimize the damage caused by floodwater and frost action and improve the ability of the roads to support vehicular traffic.

The land capability classification is IIw. The woodland ordination symbol is 5A.

Wk—Wilbur silt loam, frequently flooded. This nearly level, deep, moderately well drained soil is on bottom land. It is frequently flooded during winter and early spring. Areas are long and narrow and are 5 to 40 acres in size. The dominant size is about 20 acres.

Typically, the surface layer is brown silt loam about 7 inches thick. The subsoil is dark yellowish brown, friable

silt loam about 10 inches thick. The underlying material to a depth of about 60 inches is mottled silt loam. It is brown in the upper part and light brownish gray in the lower part. In some places the soil has 6 to 10 inches of loamy or sandy overwash. In other places loamy material is below a depth of 40 inches. In a few areas strata of fine sand are below a depth of 40 inches.

Included with this soil in mapping are the poorly drained Birds and somewhat poorly drained Wakeland soils in the slightly lower landscape positions and the well drained Haymond soils in the slightly higher positions. Also included are undrained marshy spots and areas of sandy soils. Included soils make up about 15 percent of the map unit.

The Wilbur soil has a very high available water capacity. Permeability is moderate. The organic matter content is moderate in the surface layer. Runoff is slow. The water table is at a depth of about 1.5 to 3.0 feet during winter and early spring.

Most areas of this soil are used for cultivated crops. Some are wooded, and a few are used for hay and pasture.

This soil is well suited to corn and soybeans. The flooding is the main hazard. It generally does not occur during the cropping season and only occasionally causes crop loss. Levees can control the flooding, but they are expensive if they are designed to provide total protection. Crop residue management increases the organic matter content and improves tilth. The soil is well suited to spring plowing, spring chiseling, and a no-till cropping system.

This soil is well suited to grasses and legumes for hay and pasture. Examples of suitable grasses are orchardgrass and tall fescue, and examples of suitable legumes are red clover and ladino clover. The flooding is the main hazard. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. Plant competition is moderate. It can be controlled by proper site preparation and by spraying, cutting, or girdling.

Because of the flooding, this soil is generally unsuitable as a site for dwellings and septic tank absorption fields. It is severely limited as a site for local roads because of the flooding and frost action. Constructing the roads on raised, well compacted fill material, strengthening or replacing the base with better suited material, and providing adequate roadside ditches and culverts minimize the damage caused by floodwater and frost action and improve the ability of the roads to support vehicular traffic.

The land capability classification is IIw. The woodland ordination symbol is 8A.

Wo—Wilhite silty clay, frequently flooded. This nearly level, deep, very poorly drained soil is in depressions and old channels on bottom land. During winter and spring, it is frequently flooded and is subject to ponding. Areas are generally long and narrow and are 5 to 30 acres in size. The dominant size is about 15 acres.

Typically, the surface layer is dark grayish brown silty clay loam about 8 inches thick. The subsoil is mottled silty clay about 28 inches thick. It is gray and friable in the upper part and light gray and firm in the lower part. The underlying material to a depth of about 70 inches is light gray silty clay loam. In some areas the surface layer is silty clay loam. In some places the soil has 6 to 20 inches of loamy or sandy overwash. In other places the subsoil is browner.

Included with this soil in mapping are the moderately well drained Lindside and well drained Nolin soils in the slightly higher landscape positions. Also included are soils that are ponded much of the year. Included soils make up about 5 percent of the map unit.

The Wilhite soil has a moderate available water capacity. Permeability is very slow. The organic matter content is high in the surface layer. Runoff is very slow. The water table is near or above the surface during winter and spring.

Most areas of this soil are wooded. A few are used for cultivated crops.

This soil is poorly suited to corn and soybeans. The flooding and the ponding are the main hazards. The flooding generally does not occur during the cropping season, but the overflow water often ponds late enough to delay planting. Levees help to control the flooding. Surface drains or open ditches can remove excess water, but an adequate outlet commonly is not available. A system of conservation tillage that leaves all or part of the crop residue on the surface, cover crops, and crop residue management improve tilth and help to maintain the organic matter content.

This soil is poorly suited to grasses for hay and pasture because of the flooding and the ponding. The wetness is a limitation. A drainage system is needed.

This soil is fairly well suited to trees. The equipment limitation, seedling mortality, the windthrow hazard, and plant competition are management concerns. Equipment should be used only during dry periods or when the ground is frozen. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling. The species that can withstand the wetness and the flooding should be selected for planting. Special site preparation, such as bedding, increases the seedling survival rate. Some replanting may be necessary. Protective borders or windbreaks on the windward side of the wooded tracts help to prevent windthrow. Windthrown trees should be removed periodically.

Because of the flooding and the ponding, this soil is generally unsuitable as a site for dwellings and sanitary facilities. It is severely limited as a site for local roads because of the flooding, the ponding, and low strength. Constructing the roads on raised, well compacted fill material, strengthening or replacing the base with better suited material, and providing adequate roadside ditches and culverts minimize the damage caused by low strength, flooding, and ponding and improve the ability of the roads to support vehicular traffic. Levees help to control flooding.

The land capability classification is IVw. The woodland ordination symbol is 5W.

Wr—Wirt silt loam, sandy substratum, frequently flooded. This nearly level, deep, well drained soil is on bottom land. It is frequently flooded during winter and early spring. Areas are irregular in shape and are 5 to 20 acres in size. The dominant size is about 10 acres.

Typically, the surface layer is dark grayish brown silt loam about 8 inches thick. The subsoil is about 16 inches of dark yellowish brown, friable silt loam and sandy loam. The underlying material to a depth of about 60 inches occurs as strata of yellowish brown sand and dark yellowish brown loamy sand. In some places the subsoil is thicker. In other places the surface layer is sandy loam.

Included with this soil in mapping are the somewhat excessively drained Moundhaven soils along old stream channels and the well drained Chagrin and Nolin soils in the slightly lower landscape positions. Chagrin soils have a solum that is thicker than that of the Wirt soil. Nolin soils have more clay than the Wirt soil. Included soils make up about 15 percent of the map unit.

The Wirt soil has a moderate available water capacity. Permeability is moderate in the upper part of the soil and moderately rapid or rapid in the underlying material. The organic matter content is low in the surface layer. Runoff is slow.

Most areas of this soil are used for cultivated crops. Some are wooded.

This soil is well suited to corn and soybeans. The flooding is the main hazard. It generally does not occur during the cropping season and only occasionally causes crop damage. Levees can control the flooding, but they are extremely expensive if they are constructed to provide total protection. Cover crops and crop residue management improve tilth and increase the organic matter content. The soil is well suited to spring plowing, spring chiseling, and a no-till cropping system.

This soil is well suited to grasses and legumes for hay and pasture. Examples of suitable grasses are orchardgrass, timothy, and tall fescue, and examples of suitable legumes are red clover and ladino clover. The flooding is the main hazard. Overgrazing or grazing when the soil is wet results in surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. No major hazards or limitations affect planting or harvesting.

Because of the flooding, this soil is generally unsuitable as a site for dwellings and septic tank absorption fields and is severely limited as a site for local roads. Constructing the roads on raised, well compacted fill material and providing adequate roadside ditches and culverts minimize the damage caused by floodwater.

The land capability classification is IIw. The woodland ordination symbol is 4A.

Zp—Zipp silty clay. This nearly level, deep, very poorly drained soil is on river terraces and lake plains. It is subject to ponding. Areas are irregular in shape and are 5 to more than 1,500 acres in size. The dominant size is about 800 acres.

Typically, the surface layer is dark gray silty clay about 9 inches thick. The subsoil is gray, mottled, firm clay about 37 inches thick. The underlying material to a depth of about 60 inches is light gray, mottled clay. In some places the soil has less clay. In other places it is more acid. In some areas the solum has more sand. In a few areas the underlying material has strata of sandy and loamy material.

Included with this soil in mapping are the poorly drained Vincennes soils. These soils are in landscape positions similar to those of the Zipp soil. Also included are soils that have a sandy surface layer. Included soils make up about 5 percent of the map unit.

The Zipp soil has a moderate available water capacity. Permeability is slow. The organic matter content is moderate in the surface layer. This layer tends to be sticky or cloddy unless it is tilled within a narrow range in moisture content. Runoff is very slow. The water table is near or above the surface during winter and early spring.

Most areas of this soil are used for cultivated crops. Some are wooded, and a few are used for hay and pasture.

If drained, this soil is fairly well suited to corn, soybeans, and winter wheat. The ponding is the main hazard. Subsurface drains, surface drains, and open ditches help to remove excess water. Cover crops and crop residue management improve tilth and increase the organic matter content. The soil is well suited to fall plowing, fall chiseling, and till-plant and ridge-plant cropping systems.

This soil is well suited to grasses and legumes for hay and pasture. It is better suited to grasses than to deep-rooted legumes because of the seasonal high water table. Examples of suitable grasses are orchardgrass and tall fescue, and an example of a suitable legume is ladino clover. The ponding is the main hazard. A drainage system is needed. Overgrazing or grazing when the soil is wet results in surface compaction and poor

tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

This soil is well suited to trees. The equipment limitation, seedling mortality, the windthrow hazard, and plant competition are management concerns. Equipment should be used only during dry periods or when the ground is frozen. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling. Special site preparation, such as bedding, increases the seedling survival rate. Some replanting may be necessary. Harvest methods that do not isolate the remaining trees or leave them widely spaced reduce the windthrow hazard. Windthrown trees should be removed periodically.

Because of the ponding, this soil is generally unsuitable as a site for dwellings and septic tank absorption fields. It is severely limited as a site for local roads because of the ponding, low strength, and the shrink-swell potential. Constructing the roads on raised, well compacted fill material, strengthening or replacing the base with better suited material, and providing adequate roadside ditches and culverts minimize the damage caused by low strength, ponding, and shrinking and swelling and improve the ability of the roads to support vehicular traffic.

The land capability classification is IIIw. The woodland ordination symbol is 5W.

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is the land that is best suited to food, feed, forage, fiber, and oilseed crops. It may be cultivated land, pasture, woodland, or other land, but it is not urban and built-up land or water areas. It either is used for food or fiber crops or is available for those crops. The soil qualities, growing season, and moisture supply are those needed for a well managed soil to produce a sustained high yield of crops in an economic manner. Prime farmland produces the highest yields with minimal inputs of energy and economic resources, and farming it results in the least damage to the environment.

Prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The level of acidity or alkalinity is acceptable. Prime farmland has few or no rocks and is permeable to water and air. It is not excessively erodible or saturated with water for long periods and is not frequently flooded during the growing season. The slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Soil Conservation Service.

About 225,000 acres in the county, or 70 percent of the total acreage, meets the soil requirements for prime farmland. Most of this prime farmland is used for crops. The crops grown on this land, mainly corn and soybeans, account for most of the county's agricultural income each year.

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

The map units in the survey area that are considered prime farmland are listed in table 5. This list does not constitute a recommendation for a particular land use. The extent of each listed map unit is shown in table 4. The location is shown on the detailed soil maps at the back of this publication. The soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."

Some soils that have a seasonal high water table and all soils that are frequently flooded during the growing season qualify for prime farmland only in areas where these limitations have been overcome by drainage measures or flood control. The need for these measures is indicated after the map unit name in table 5. Onsite evaluation is needed to determine whether or not these limitations have been overcome by corrective measures.

Use and Management of the Soils

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

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

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

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

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

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

Crops and Pasture

Darrell L. Rice, district conservationist, Soil Conservation Service, helped prepare this section.

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Soil Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

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

About 224,000 acres in the county was used for crops and pasture in 1982. Of this total, about 170,000 acres was used for row crops, mainly corn and soybeans; 26,000 acres for close-grown crops, mainly wheat; and 15,000 acres for hay and pasture (*14*). The rest was idle cropland or was used for conservation purposes. A more recent estimate indicates that the acreage of cropland has increased, mainly at the expense of permanent pasture and woodland.

The potential of the soils in Gibson County for increased food production is fair. About 8,000 acres of potentially good cropland is currently used as pasture and 14,000 acres as woodland (*12*). In addition to the reserve production capacity represented by this land, food production could also be increased by extending the latest crop production technology to all of the cropland in the county. This soil survey can greatly facilitate the application of such technology.

The paragraphs that follow describe the major management concerns in the areas of the county used for crops and pasture. These concerns are erosion, wetness, flooding, droughtiness, fertility, and tilth.

Erosion is a major problem on about 40 percent of the cropland and pasture in the county. It is a hazard if the slope is more than 2 percent.

Loss of the surface layer through erosion is damaging for two reasons. First, productivity is reduced as the original surface layer is lost and part of the subsoil is mixed with the plow layer. Preparing a good seedbed and tilling are difficult on eroded soils because the exposed subsoil is more clayey and less friable than the original surface layer. Loss of the surface layer is especially damaging on Gudgel, Hosmer, and other soils that have a fragipan, which hinders root penetration. Much of the fertilizer applied on these soils remains in the plow layer. Erosion can carry away the fertilizer along with the eroding soil material. Second, erosion can result in sedimentation of streams and ditches (fig. 7). Control of erosion helps to prevent the clogging of drainage

ditches and the pollution of streams by sediment, fertilizers, herbicides, and pesticides and improves water quality for municipal use, for recreation, and for fish and wildlife.

Erosion-control measures provide a protective cover, reduce the runoff rate, and increase the rate of water infiltration. A cropping system that keeps a vegetative cover on the soils for extended periods can hold soil losses to an amount that does not reduce the productive capacity of the soils. On livestock farms, where pasture and hay are needed, including forage crops of grasses and legumes in the cropping sequence reduces the susceptibility of the more sloping land to erosion and provides nitrogen and improves tilth for the following crop.

In some areas of the county, such as many areas of Alford and Sylvan soils, the slopes are so short and irregular that the benefits derived from contour farming and terraces are limited. In these areas cropping systems that provide a substantial vegetative cover are needed to control erosion. These systems can be applied on most of the soils in the county. No-till farming helps to control erosion in the more sloping areas used for row crops. It is suited to many of the soils in the county.

Diversions and parallel tile outlet terraces shorten the length of the slopes and thus are effective in reducing the susceptibility to sheet, rill, and gully erosion. Terraces reduce soil loss and the associated loss of fertilizer elements, help to prevent the damage to crops

Figure 7.—Sedimentation of a roadside ditch.

and watercourses caused by eroding sediment, and help to eliminate the need for grassed waterways, which take productive land out of row crop production. Terracing also makes farming on the contour easier and thus reduces fuel consumption and the amount of pesticides entering watercourses. Careful design is needed to adapt the terraces to the existing topography in the county. Many areas are not suitable for terracing because they lack long, uniform slopes.

Water- and sediment-control basins commonly help to control erosion in the county. They consist of a series of short terraces or dry dams that have subsurface outlets and are constructed across small drainageways. They reduce the rate of runoff and trap sediment.

Grassed waterways are needed on the more sloping cropland. These waterways commonly require drainage tile to control seepage and to maintain a good grass cover.

Grade stabilization structures help to control gully erosion. They minimize erosion where surface water drains into an open ditch (fig. 8). These structures are needed in open ditches where an excessive gradient results in erosion of the sides and bottom of the channel.

Wetness is a major problem on about 39 percent of the cropland and pasture in the county. It is a problem on the poorly drained, slowly permeable Vincennes soils. A drainage system is needed. One has been installed in many areas of these soils. A drainage system also is needed in areas of somewhat poorly drained soils, such as Ayshire Variant and Reesville soils.

The design of both surface and subsurface drainage systems varies with the kind of soil. A combination of surface drains and open ditches may be needed in areas of the very poorly drained Ragsdale soils that are intensively row cropped. The drains should be more closely spaced in slowly permeable or very slowly permeable soils than in the more rapidly permeable soils. Subsurface drains function satisfactorily in Peoga and Patton soils if careful design and installation measures are applied. These drains may not function adequately in areas of Zipp soils. Adequate drainage outlets commonly are not available in these areas. As a result, pumps may be needed. Wakeland and Stendal soils can be adequately drained by subsurface drains.

Flooding is a hazard on bottom land and in unprotected areas of low lying soils on terraces. About 26 percent of the county is subject to flooding. Most of the soils on bottom land, such as Nolin and Wilbur soils, are flooded during winter and spring. The flooding generally does not occur during the cropping season and is of brief duration. It rarely causes substantial crop loss. Floodwater ponds in small depressional areas of Newark and Wilhite soils. It often delays planting in these areas. Winter wheat is seldom planted on the bottom land because of the hazard of winter flooding. Dikes and levees help to protect the bottom land, but construction and maintenance are very costly. Because some areas of bottom land are small, flood-prevention measures are not always economically feasible.

Droughtiness is a limitation on about 4 percent of the acreage in the county. The coarser textured soils, such as Bloomfield and Moundhaven soils, have a low available water capacity (fig. 9). During periods of inadequate rainfall, crops growing on these soils are subject to moisture stress. Small grain crops that mature before the drier part of the year can be grown on these soils. Adding organic matter and applying a system of conservation tillage that leaves crop residue on the surface conserve moisture and reduce soil loss.

Fertility is naturally moderate or low in many of the soils on uplands and terraces in the county. Soils on bottom land, such as Lindside and Nolin soils, are naturally higher in content of plant nutrients than most of the soils on uplands and terraces. They generally are neutral in reaction.

The soils on uplands and terraces, such as Alford, Hosmer, and Elkinsville soils, are naturally medium acid or strongly acid in the surface layer. Applications of ground limestone generally are needed to raise the pH level for crops that grow well only on nearly neutral soils. Available phosphorus and potash levels are naturally low in most of these soils. On all soils additions of lime and fertilizer should be based on the results of soil tests, on the needs of the crop, and on the expected level of yields. The Cooperative Extension Service can help in determining the kinds and amounts of fertilizer and lime to be applied.

Tilth is an important factor affecting the germination of seeds and the infiltration of water into the soil. Soils with good tilth are granular and porous.

Most of the soils used for crops in the county have a silt loam surface layer that is low to moderate in content of organic matter. Generally, the structure of these soils is moderate or weak. A surface crust forms during periods of heavy rainfall. The crust is hard when dry and is impervious to water. As a result, it reduces the rate of water infiltration and increases the runoff rate. Regular additions of crop residue, manure, and other organic material improve soil structure and minimize crusting.

Fall plowing generally is not a good practice on the light colored or moderately dark colored soils that have a silt loam surface layer because a crust forms in winter and spring. Also, the wetter soils tend to puddle during these periods. Many of these soils are nearly as hard and dense at planting time as they were before they were plowed in the fall. The more sloping soils are subject to erosion if they are plowed in the fall.

Field crops suited to the soils and climate of the county include many that are not commonly grown. Corn and soybeans are the main row crops. Grain sorghum, sunflowers, and navy beans can be grown if economic conditions are favorable. Wheat is the chief close-grown crop. Oats, rye, early buckwheat, and flax can be grown,

Figure 8.—A drop structure that conducts water from a shallow surface drain to an open ditch.

and grass seed could be produced from fescue, redtop, and bluegrass.

Pasture and hay crops commonly grown in the county include mixtures of fescue, timothy, orchardgrass, alfalfa, white clover, and red clover. Other suitable species include bluegrass, reed canarygrass, redtop, ladino clover, lespedeza, alsike clover, sweet clover, and birdsfoot trefoil. The kind of forage needed and the soil type determine the species to be selected for planting.

On well drained and moderately well drained soils that do not have a fragipan and are not frequently flooded, most of the more common forage crops grow well.

Lespedeza, Canada bluegrass, fescue, or redtop should be selected for planting on soils that are droughty and are low in fertility or pH. Alfalfa, sweet clover, birdsfoot trefoil, orchardgrass, and bromegrass grow well on droughty soils if the fertility level is medium or high.

Soils that have a fragipan, a clayey subsoil, or a high water table are not suited to alfalfa or other deep-rooted legumes. Root growth is greatly restricted in these soils. Because of freezing and thawing, the legumes can heave out of the soils. The soils that have a fragipan are best suited to grasses and shallow-rooted legumes, such as lespedeza, ladino clover, and white clover.

The best suited species on somewhat poorly drained soils are reed canarygrass, tall fescue, redtop, ladino clover, white clover, alsike clover, timothy, birdsfoot trefoil, and Canada bluegrass. The best suited species on poorly drained and very poorly drained soils are reed canarygrass, redtop, and alsike clover. Installing a drainage system improves productivity and enables other species to be grown.

Soils that are flooded for long periods are poorly suited to most grasses and legumes. Reed canarygrass, tall fescue, and timothy can withstand flooding for periods of more than 30 days.

Figure 9.—Crop loss caused by drought in an area of Moundhaven fine sandy loam, frequently flooded.

Specialty crops are not grown extensively in the county. Melons are grown commercially in the western part of the county, mainly on Bloomfield soils. Watermelon and cantaloup grow well on these soils. Deep, well drained soils that warm up early in spring are well suited to vegetables and small fruits. They include Alford, Alvin, and Sylvan soils.

Most of the well drained soils in the county are suitable for orchards and nursery crops. Soils in low areas where frost is frequent and air drainage is poor are poorly suited to early vegetables, small fruits, and orchards.

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

Yields Per Acre

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

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

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

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

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

Land Capability Classification

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

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit. Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

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

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

The acreage of soils in each capability class and subclass is shown in table 7. The capability classification of each map unit is given in the section "Detailed Soil Map Units" and in the yields table.

Woodland Management and Productivity

Michael D. Warner, forester, Soil Conservation Service, helped prepare this section.

Table 8 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for an indicator tree species. The number indicates the volume, in cubic meters per hectare per year, which the indicator species can produce. The number 1 indicates low potential productivity; 2 and 3, moderate; 4 and 5, moderately high; 6 to 8, high; 9 to 11, very high; and 12 to 39, extremely high. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *R* indicates steep slopes; *X*, stoniness or rockiness; *W*, excess water in or on the soil; *T*, toxic substances in the soil; *D*, restricted rooting depth; *C*, clay in the upper part of the soil; *S*, sandy texture; *F*, a high content of rock fragments in the soil; and *L*, low strength. The letter *A* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: R, X, W, T, D, C, S, F, and L.

In table 8, *slight*, *moderate*, and *severe* indicate the degree of the major soil limitations to be considered in management.

Erosion hazard is the probability that damage will occur as a result of site preparation and cutting where the soil is exposed along roads, skid trails, fire lanes, and log-handling areas. Forests that have been burned or overgrazed are also subject to erosion. Ratings of the erosion hazard are based on the percent of the slope. A rating of *slight* indicates that no particular prevention measures are needed under ordinary conditions. A rating of *moderate* indicates that erosion-control measures are needed in certain silvicultural activities. A rating of *severe* indicates that special precautions are needed to control erosion in most silvicultural activities.

Equipment limitation reflects the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. The chief characteristics and conditions considered in the ratings are slope, stones on the surface, rock outcrops, soil wetness, and texture of the surface layer. A rating of *slight* indicates that under normal conditions the kind of equipment or season of use is not significantly restricted by soil factors. Soil wetness can restrict equipment use, but the wet period does not exceed 1 month. A rating of *moderate* indicates that equipment use is moderately restricted because of one or more soil factors. If the soil is wet, the wetness restricts equipment use for a period of 1 to 3 months. A rating of *severe* indicates that equipment use is severely restricted either as to the kind of equipment that can be used or the season of use. If the soil is wet, the wetness restricts equipment use for more than 3 months.

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

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

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

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

The first species listed under *common trees* for a soil is the indicator species for that soil. It is the dominant

species on the soil and the one that determines the ordination class.

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

Windbreaks and Environmental Plantings

Windbreaks protect livestock, buildings, and yards from wind and snow. They also protect fruit trees and gardens, and they furnish habitat for wildlife. Several rows of low- and high-growing broadleaf and coniferous trees and shrubs provide the most protection.

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

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

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

Recreation

The soils of the survey area are rated in table 10 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewerlines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 10, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 10 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 13 and interpretations for dwellings without basements and for local roads and streets in table 12.

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

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

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

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

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

Wildlife Habitat

James D. McCall, biologist, Soil Conservation Service, helped prepare this section.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 11, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, soybeans, wheat, oats, sorghum, and sunflowers.

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

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, wheatgrass, ragweed, pokeweed, sheep sorrel, dock, crabgrass, and dandelion.

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, wild cherry, sweetgum, willow, apple, black walnut, hawthorn, dogwood, hickory, hazelnut, blackberry, elderberry, and mayapple. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are autumn-olive, crabapple, and dogwood.

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 cattail, smartweed, wild millet, arrowhead, waterplantain, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The wildlife attracted to these areas include bobwhite quail, dove, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous

plants. Wildlife attracted to these areas include wild turkey, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, and white-tailed deer.

Habitat for wetland wildlife consists of marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, rails, kingfishers, mink, and beaver.

Edge habitat consists of areas where major land uses or cover types adjoin. A good example is the border between dense woodland and a field of no-till corn. Although not rated in the table, edge habitat is of primary importance to animals from the smallest songbirds to white-tailed deer. Most of the animals that inhabit openland or woodland also frequent edge habitat, and desirable edge areas are consistently used by 10 times as many wildlife as are the centers of large areas of woodland or cropland.

Engineering

Max L. Evans, state conservation engineer, Soil Conservation Service, helped prepare this section.

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. The ratings are given in the following tables: Building site development, Sanitary facilities, Construction materials, and Water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations need to be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to (1) evaluate the potential of areas for residential, commercial, industrial, and recreation uses; (2) make preliminary estimates of construction conditions; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; (5) plan detailed onsite investigations of soils and geology; (6) locate potential sources of gravel, sand, earthfill, and topsoil; (7) plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and (8) predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

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

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

Building Site Development

Table 12 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the

excavation walls or banks to sloughing or caving is affected by soil texture and the depth to the water table.

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrink-swell potential, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, slope, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 to 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material, a base of gravel, crushed rock, or stabilized soil material, and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost action potential, and depth to a high water table affect the traffic supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a cemented pan, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 13 shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 13 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 13 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage due to rapid permeability of the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the

lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground water pollution. Ease of excavation and revegetation needs to be considered.

The ratings in table 13 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area type sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 14 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet, and the depth to the water table is less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. In table 14, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

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

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

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

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

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

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

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 15 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas and for embankments, dikes, and levees. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

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

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

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and potential frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, or sulfur. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or to a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to reduce erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of soil blowing or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of soil blowing, low available water capacity, restricted rooting depth, toxic substances such as salts or sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classifications, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

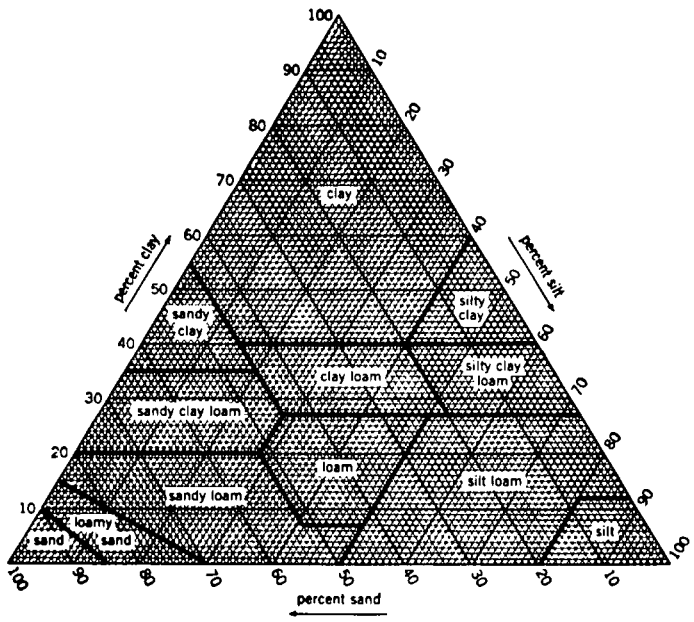


Figure 10.—Percentages of clay, silt, and sand in the basic USDA soil textural classes.

Engineering Index Properties

Table 16 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

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

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter (fig. 10). "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as about 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (*2*) and the system adopted by the American Association of State Highway and Transportation Officials (*1*).

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

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of

grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

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

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

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

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

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

Physical and Chemical Properties

Table 17 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, and plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3 bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

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

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

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to

buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.05 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

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

Wind erodibility groups are made up of soils that have similar properties affecting their resistance to soil blowing in cultivated areas. The groups indicate the susceptibility to soil blowing. Soils are grouped according to the following distinctions:

1. Sands, coarse sands, fine sands, and very fine sands. These soils are generally not suitable for crops. They are extremely erodible, and vegetation is difficult to establish.
2. Loamy sands, loamy fine sands, and loamy very fine sands. These soils are very highly erodible. Crops can be grown if intensive measures to control soil blowing are used.
3. Sandy loams, coarse sandy loams, fine sandy loams, and very fine sandy loams. These soils are highly erodible. Crops can be grown if intensive measures to control soil blowing are used.

4L. Calcareous loamy soils that are less than 35 percent clay and more than 5 percent finely divided calcium carbonate. These soils are erodible. Crops can be grown if intensive measures to control soil blowing are used.

4. Clays, silty clays, clay loams, and silty clay loams that are more than 35 percent clay. These soils are moderately erodible. Crops can be grown if measures to control soil blowing are used.
5. Loamy soils that are less than 20 percent clay and less than 5 percent finely divided calcium carbonate and sandy clay loams and sandy clays that are less than 5 percent finely divided calcium carbonate. These soils are slightly erodible. Crops can be grown if measures to control soil blowing are used.
6. Loamy soils that are 20 to 35 percent clay and less than 5 percent finely divided calcium carbonate, except silty clay loams. These soils are very slightly erodible. Crops can easily be grown.
7. Silty clay loams that are less than 35 percent clay and less than 5 percent finely divided calcium carbonate. These soils are very slightly erodible. Crops can easily be grown.
8. Stony or gravelly soils and other soils not subject to soil blowing.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 17, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter of a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 18 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

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

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

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

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

If a soil is assigned to two hydrologic groups in table 18, the first letter is for drained areas and the second is for undrained areas.

Flooding, the temporary inundation of an area, is caused by overflowing streams or by runoff from adjacent slopes. Water standing for short periods after rainfall or snowmelt is not considered flooding, nor is water in swamps and marshes.

Table 18 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *occasional* that it occurs, on the average, once or less in 2 years; and *frequent* that it occurs, on the average, more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; November-May, for example, means that flooding can occur during the period November through May.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons that form in soils that are not subject to flooding.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 18 are the depth to the seasonal high water table; the kind of water table—that is, perched or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 18.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Only saturated zones within a depth of about 6 feet are indicated. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. The first numeral in the range indicates how high the water rises above the surface. The second numeral indicates the depth below the surface.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Potential frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage mainly to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a severe corrosion environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (*11*). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 19 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Ten soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is 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; 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 is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Hapludalfs.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Mostly the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-silty, mixed, mesic Typic Hapludalfs.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the underlying material can differ within a series.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. The soil is compared with similar soils and with nearby soils of other series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the *Soil Survey Manual* (*10*). Many of the technical terms used in the descriptions are defined in *Soil Taxonomy* (*11*). Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Adrian Series

The Adrian series consists of deep, very poorly drained soils in depressions on river terraces. These soils formed in organic material over sand. The organic material is derived from reeds and marsh grasses. Permeability is moderately slow to moderately rapid in the organic material and rapid in the sandy material. Slopes range from 0 to 2 percent.

Adrian soils are commonly near Lyles, Montgomery, Patton, and Rensselaer soils. The nearby soils do not have organic layers. They are in the slightly higher positions on the landscape.

Typical pedon of Adrian muck, in a cultivated area of Adrian-Rensselaer complex, drained; 190 feet south and 1,650 feet west of the northeast corner of sec. 18, T. 3 S., R. 12 W.

Op—0 to 8 inches; sapric material, black (N 2/0) broken face and rubbed; less than 5 percent fiber; weak fine granular structure; neutral; gradual smooth boundary.
Oa1—8 to 20 inches; sapric material, black (N 2/0) broken face and rubbed; less than 5 percent fiber; weak fine subangular blocky structure; slightly acid; gradual smooth boundary.
Oa2—20 to 34 inches; sapric material, black (10YR 2/1) broken face, brown (10YR 4/3) rubbed; about 15 percent stems and leaves; about 5 percent fiber after rubbing; weak fine prismatic structure; slightly acid; clear smooth boundary.
Cg1—34 to 42 inches; light brownish gray (2.5Y 6/2) sand; single grain; loose; many shell fragments; strong effervescence; mildly alkaline; gradual smooth boundary.
Cg2—42 to 60 inches; light brownish gray (10YR 6/2) sand; few fine distinct brownish yellow (10YR 6/6) mottles; single grain; loose; strong effervescence; mildly alkaline.

The depth to the sandy underlying material ranges from 20 to 50 inches. The Op and Oa1 horizons have hue of N or 10YR and chroma of 0 or 1. The Oa2 horizon has value of 2 or 3 and chroma of 1 to 3 broken face and has value and chroma of 3 or 4 rubbed. It is 0 to 20 inches thick. Some pedons have a few woody fragments. The C horizon has value of 5 or 6 and chroma of 2 to 6. In some pedons it has thin strata of silty material.

Alford Series

The Alford series consists of deep, well drained, moderately permeable soils in the uplands. These soils formed in silty loess. Slopes range from 0 to 50 percent.

The Alford soils in map units AlA, AlB2, AlC2, AlD2, AlE, and AmF are taxadjuncts because they have a base saturation that is lower than is definitive for the series. Those in map units AlB3, AlC3, and AlD3 also are taxadjuncts because they do not have an argillic horizon. These differences do not alter the use and management of the soils.

Alford soils are similar to Sylvan and Uniontown soils and are commonly near Alvin, Bloomfield, Iva, Parke, Peoga, Sylvan, and Taftown soils. Sylvan and Uniontown soils have a solum that is thinner than that of the Alford soils. Sylvan soils are in landscape positions similar to those of the Alford soils. Uniontown soils are on lacustrine terraces. Alvin and Bloomfield soils have more sand than the Alford soils. They are in landscape positions similar to those of the Alford soils. Iva and Peoga soils have a grayish subsoil. They are in depressions. Parke and Taftown soils are lower on the landscape than the Alford soils. Parke soils have loamy outwash in the lower part of the subsoil. Taftown soils have sandstone and shale residuum in the lower part of the subsoil.

Typical pedon of Alford silt loam, 2 to 6 percent slopes, eroded, in a cultivated field; 2,390 feet west and 80 feet north of the southeast corner of sec. 27, T. 1 N., R. 10 W.

Ap—0 to 12 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; mixed with some yellowish brown (10YR 5/6) subsoil material; weak medium granular structure; friable; many fine roots; neutral; abrupt smooth boundary.
Bt1—12 to 20 inches; yellowish brown (10YR 5/6) silt loam; moderate medium subangular blocky structure; friable; few fine roots; thin continuous dark brown (7.5YR 4/4) clay films on faces of peds; medium acid; gradual smooth boundary.
Bt2—20 to 39 inches; yellowish brown (10YR 5/6) silt loam; moderate medium subangular blocky structure; friable; few fine roots; thin continuous dark brown (7.5YR 4/4) clay films on faces of peds; few black (10YR 2/1) iron and manganese oxide stains; strongly acid; gradual smooth boundary.
Bt3—39 to 70 inches; yellowish brown (10YR 5/6) silt loam; weak fine subangular blocky structure; friable; thin continuous dark brown (7.5YR 4/4) clay films on faces of peds; few distinct light gray (10YR 6/1) silt coatings on faces of peds; strongly acid; gradual smooth boundary.
BC—70 to 76 inches; yellowish brown (10YR 5/6) silt loam; weak fine subangular blocky structure; friable; few distinct white (10YR 8/1) silt coatings in channels; slightly acid; gradual smooth boundary.
C—76 to 80 inches; yellowish brown (10YR 5/6) silt; massive; very friable; slightly acid.

The solum is 40 to more than 80 inches thick. The Ap horizon has chroma of 2 or 3. Pedons in undisturbed areas have a thin A horizon, which has value of 2 or 3 and chroma of 1 to 3. Some pedons have an E horizon, which has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. It is silty clay loam or silt loam and is extremely acid to medium acid. The C horizon has hue of 10YR or 7.5YR and value and chroma of 4 to 6. It is silt loam or silt and is strongly acid to neutral. Some pedons have low-chroma mottles in the lower part of the Bt horizon and in the C horizon.

Alvin Series

The Alvin series consists of deep, well drained soils in the uplands. These soils formed in loamy and sandy

windblown material. Permeability is moderate in the subsoil and moderately rapid in the underlying material. Slopes range from 2 to 18 percent.

The Alvin soils in this county have a base saturation that is lower than is definitive for the series. This difference does not alter the use and management of the soils.

Alvin soils are commonly near Alford, Ayrshire Variant, Bloomfield, and Junius Variant soils. Alford and Bloomfield soils are in landscape positions similar to those of the Alvin soils. Alford soils have less sand than the Alvin soils, and Bloomfield soils have more sand. Ayrshire Variant and Junius Variant soils have a grayish subsoil. They are in depressions.

Typical pedon of Alvin fine sandy loam, 6 to 12 percent slopes, eroded, in a pasture; 1,815 feet south and 250 feet east of the northwest corner of sec. 14, T. 2 S., R. 11 W.

Ap—0 to 9 inches; brown (10YR 4/3) fine sandy loam, pale brown (10YR 6/3) dry; mixed with some strong brown (7.5YR 5/6) subsoil material; weak very fine subangular blocky structure; friable; many fine roots; slightly acid; clear smooth boundary.

Bt1—9 to 17 inches; strong brown (7.5YR 5/6) fine sandy loam; weak medium and fine subangular blocky structure; friable; many fine roots; thin discontinuous brown (7.5YR 4/4) clay films on faces of peds; few distinct dark grayish brown (10YR 4/2) organic coatings on faces of peds; slightly acid; gradual smooth boundary.

Bt2—17 to 27 inches; strong brown (7.5YR 5/6) fine sandy loam; moderate medium subangular blocky structure; firm; many fine roots; thin continuous brown (7.5YR 4/4) clay films on faces of peds; slightly acid; gradual smooth boundary.

Bt3—27 to 38 inches; strong brown (7.5YR 5/6) fine sandy loam; moderate medium subangular blocky structure; firm; many fine roots; thin continuous brown (7.5YR 4/4) clay films on faces of peds; medium acid; gradual smooth boundary.

BC—38 to 50 inches; strong brown (7.5YR 5/6) loamy fine sand; weak very fine subangular blocky structure; very friable; many fine roots; thin discontinuous brown (7.5YR 4/4) clay films on faces of peds; medium acid; gradual smooth boundary.

C—50 to 70 inches; strong brown (7.5YR 5/6) and brown (7.5YR 5/4) fine sand; single grain; loose; common fine roots; medium acid.

The solum is 45 to 70 inches thick. The Ap horizon has chroma of 2 or 3. It is sandy loam or fine sandy loam. The Bt horizon has hue of 10YR, 7.5YR, or 5YR and value and chroma of 4 to 6. It is loam, sandy loam, or fine sandy loam. It ranges from very strongly acid to slightly acid. The C horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6. It is fine sandy loam, loamy fine sand, or fine sand.

Armiesburg Series

The Armiesburg series consists of deep, well drained, moderately permeable soils on bottom land. These soils formed in silty alluvium. Slopes range from 0 to 2 percent.

Armiesburg soils are commonly near Landes, Medway, Nolin, and Vincennes soils. Landes, Medway, and Nolin soils are in landscape positions similar to those of the Armiesburg soils. Landes and Medway soils have more sand than the Armiesburg soils. Nolin soils do not have a dark surface layer. Vincennes soils have a grayish subsoil. They are in depressions.

Typical pedon of Armiesburg silt loam, occasionally flooded, in a cultivated field; 1,320 feet south and 50 feet east of the northwest corner of sec. 15, T. 1 S., R. 11 W.

Ap—0 to 5 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine subangular blocky structure; friable; few fine roots; neutral; gradual smooth boundary.

A—5 to 18 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; weak fine granular structure; friable; few fine roots; neutral; gradual smooth boundary.

Bw1—18 to 25 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine subangular blocky structure; friable; few fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; neutral; gradual smooth boundary.

Bw2—25 to 35 inches; dark yellowish brown (10YR 4/4) silt loam; weak very thick platy structure parting to moderate medium subangular blocky; friable; neutral; gradual smooth boundary.

Bw3—35 to 55 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak very thick platy structure parting to moderate medium subangular blocky; friable; neutral; gradual smooth boundary.

Bw4—55 to 61 inches; dark yellowish brown (10YR 4/4) silty clay loam; few fine distinct grayish brown (10YR 5/2) mottles; weak fine prismatic structure parting to weak fine subangular blocky; friable; neutral; gradual smooth boundary.

Cg—61 to 80 inches; grayish brown (10YR 5/2) clay loam; many fine prominent strong brown (7.5YR 5/8) mottles; massive; firm; neutral.

The solum is 40 to 80 inches thick. It is slightly acid or neutral. The content of clay in the control section is 20 to 30 percent.

The A horizon has chroma of 1 to 3. It is silt loam or silty clay loam. The B horizon has value of 4 or 5. The C horizon has value of 4 or 5 and chroma of 2 to 4. It is clay loam, silty clay loam, or silt loam.

Ayrshire Variant

The Ayrshire Variant consists of deep, somewhat poorly drained, moderately permeable soils in the uplands. These soils formed in sandy and loamy material deposited by the wind. Slopes range from 0 to 2 percent.

Ayrshire Variant soils are similar to Crawleyville soils and are commonly near Alvin, Bloomfield, and Junius Variant soils. Crawleyville soils have more clay in the control section than the Ayrshire Variant soils. They are on river terraces. Alvin and Bloomfield soils do not have grayish colors in the subsoil. They are in the higher landscape positions. Junius Variant soils have a dominantly grayish subsoil. They are in the slightly lower positions.

Typical pedon of Ayrshire Variant fine sandy loam, in a cultivated field; 1,650 feet south and 165 feet west of the northeast corner of sec. 29, T. 2 S., R. 11 W.

Ap—0 to 8 inches; brown (10YR 5/3) fine sandy loam, very pale brown (10YR 7/3) dry; weak fine subangular blocky structure; friable; common fine roots; neutral; clear smooth boundary.

E—8 to 14 inches; light gray (10YR 7/2) fine sandy loam; common fine prominent dark yellowish brown (10YR 4/4) mottles; weak medium platy structure parting to weak fine subangular blocky; friable; common fine roots; neutral; clear smooth boundary.

Bt—14 to 24 inches; yellowish brown (10YR 5/6) loam; many medium distinct light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable; common fine roots; thin discontinuous light brownish gray (10YR 6/2) and yellowish brown (10YR 5/4) clay films on faces of peds; few distinct white (10YR 8/1) silt coatings on faces of peds; common black (10YR 2/1) accumulations of iron and manganese oxide; slightly acid; gradual smooth boundary.

Btg1—24 to 31 inches; light brownish gray (10YR 6/2) loam; many medium prominent yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; friable; common fine roots; thin discontinuous light brownish gray (10YR 6/2) clay films on faces of peds; medium acid; clear smooth boundary.

Btg2—31 to 38 inches; light brownish gray (10YR 6/2) fine sandy loam; many medium prominent yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; friable; common fine roots; thin discontinuous light brownish gray (10YR 6/2) clay films on faces of peds; medium acid; clear smooth boundary.

BCg—38 to 54 inches; light gray (10YR 7/2) fine sandy loam; common fine prominent dark yellowish brown (10YR 4/4) mottles; weak fine subangular blocky structure; friable; common fine roots; common black (10YR 2/1) accumulations of iron and manganese oxide; medium acid; clear smooth boundary.

Cg—54 to 80 inches; light gray (10YR 6/1) fine sandy loam; many coarse prominent strong brown (7.5YR 5/8) mottles; massive; friable; few fine roots in the upper part; medium acid.

The solum is 40 to 60 inches thick. The A horizon has value of 4 or 5 and chroma of 2 or 3. It is commonly fine sandy loam but in some pedons is loam or loamy fine sand. The E horizon has value of 5 to 7 and chroma of 1 or 2. The Bt horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 2 to 6. It is commonly loam or fine sandy loam, but in some pedons it has subhorizons of sandy loam or sandy clay loam. It is slightly acid to strongly acid. The C horizon has hue of 10YR to 7.5YR, value of 5 to 7, and chroma of 1 to 8. It is commonly fine sandy loam, but in some pedons it is stratified with silt loam, loam, sandy loam, or loamy sand. It is medium acid or slightly acid.

Birds Series

The Birds series consists of deep, poorly drained, moderately slowly permeable soils on bottom land. These soils formed in silty alluvium. Slopes range from 0 to 2 percent.

Birds soils are similar to Bonnie and Petrolia soils and are commonly near Wakeland and Wilbur soils. Bonnie and Petrolia soils are in landscape positions similar to those of the Birds soils. Bonnie soils are more acid than the Birds soils, and Petrolia soils have more clay. Wakeland and Wilbur soils have less clay than the Birds soils and have a browner subsoil. They are in the slightly higher positions on the landscape.

Typical pedon of Birds silt loam, frequently flooded, in a cultivated field; 1,930 feet east and 1,750 feet south of the northwest corner of sec. 28, T. 1 S., R. 9 W.

Ap—0 to 12 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak medium subangular blocky structure; friable; few fine roots; neutral; clear smooth boundary.

Bg1—12 to 27 inches; light brownish gray (10YR 6/2) silt loam; many fine prominent strong brown (7.5YR 5/8) mottles; weak fine prismatic structure parting to weak fine subangular blocky; friable; few fine roots; neutral; gradual smooth boundary.

Bg2—27 to 52 inches; light gray (10YR 6/1) silt loam; many fine prominent yellowish brown (10YR 5/8) mottles; weak fine prismatic structure parting to weak fine subangular blocky; friable; few fine roots; neutral; clear smooth boundary.

Bg3—52 to 80 inches; gray (10YR 5/1) silt loam; common fine prominent dark yellowish brown (10YR 4/4) mottles; moderate fine prismatic structure parting to moderate medium subangular blocky; firm; neutral.

The control section ranges from strongly acid to mildly alkaline. The A horizon has value of 4 or 5 and chroma of 1 or 2. The Bg horizon has hue of 10YR or 2.5Y. Some pedons have horizons or strata of silt loam, loam, or sandy loam below the control section. Some have a Cg horizon, which has colors and textures similar to those of the Bg horizon.

Bloomfield Series

The Bloomfield series consists of deep, somewhat excessively drained, rapidly permeable soils on ridgetops and side slopes in the uplands. These soils formed in sandy wind-deposited material. Slopes range from 0 to 50 percent.

Bloomfield soils are commonly near Alford, Alvin, Ayrshire Variant, Junius Variant, and Sylvan soils. Alford, Alvin, and Sylvan soils are in landscape positions similar to those of the Bloomfield soils. Alford and Sylvan soils have less sand than the Bloomfield soils. Alvin soils have more clay in the subsoil than the Bloomfield soils. Ayrshire Variant and Junius Variant soils have a grayish subsoil. They are in depressions.

Typical pedon of Bloomfield sand, 6 to 12 percent slopes, in an idle area; 535 feet east and 40 feet north of the southwest corner of sec. 4, T. 3 S., R. 12 W.

Ap—0 to 8 inches; brown (10YR 4/3) sand, pale brown (10YR 6/3) dry; weak very fine granular structure; very friable; many fine roots; neutral; gradual smooth boundary.

E—8 to 30 inches; strong brown (7.5YR 5/6) loamy sand; weak very fine granular structure; very friable; common fine roots; neutral; gradual smooth boundary.

E&Bt—30 to 61 inches; strong brown (7.5YR 5/6) sand (E); single grain; loose; reddish brown (5YR 4/4) sand in bands that range from 1/8 inch to 2 inches in thickness (Bt); clay bridges between sand grains; weak fine subangular blocky structure; very friable; total thickness of the Bt bands is 6.25 inches; neutral; gradual smooth boundary.

Bt&E—61 to 80 inches; reddish brown (5YR 4/4) sand in nearly continuous bands (Bt); weak fine subangular blocky structure; very friable; clay bridges between sand grains; total thickness of the Bt bands is 12 inches; yellowish brown (10YR 5/6) sand interbands (E); single grain; loose; neutral.

The solum is 54 to more than 80 inches thick. The depth to the bands typically is 35 inches, but it ranges from 30 to 45 inches. The combined thickness of the bands is less than 3 inches to a depth of 40 inches and is 6 inches or more to a depth of 60 inches.

The Ap horizon has chroma of 3 or 4. Pedons in uncultivated areas have an A horizon. This horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. It is sand, loamy fine sand, or loamy sand.

The E horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6. It is loamy fine sand, loamy sand, sand, or fine sand. It ranges from neutral to strongly acid.

The E&Bt and Bt&E horizons have hue of 7.5YR or 5YR, value of 4 or 5, and chroma of 4 to 6. They range from strongly acid to mildly alkaline. The Bt bands are discontinuous and less than 1/8 inch thick in the upper part and are thicker and continuous in the lower part.

Some pedons have a C horizon within a depth of 80 inches. This horizon has hue of 10YR, value of 5, and chroma of 5 or 6. It is fine sand or sand. It is slightly acid to mildly alkaline and in some pedons is calcareous.

Bloomfield sand, 0 to 2 percent slopes, is a taxadjunct because it does not have textural bands within a depth of 60 inches. This difference does not alter the use and management of the soil.

Bonnie Series

The Bonnie series consists of deep, poorly drained, moderately slowly permeable soils on bottom land. These soils formed in silty alluvium. Slopes range from 0 to 2 percent.

The Bonnie soils in this county are less acid in the lower part of the control section than is definitive for the series. This difference does not alter the use and management of the soils.

Bonnie soils are similar to Birds and Petrolia soils and are commonly near Steff and Stendal soils. Birds and Petrolia soils are less acid than the Bonnie soils. They are in landscape positions similar to those of the Bonnie soils. Steff and Stendal soils are slightly higher on the landscape than the Bonnie soils. Also, Steff soils have a browner subsoil, and Stendal soils are less gray in the upper part of the subsoil.

Typical pedon of Bonnie silt loam, frequently flooded, in a cultivated field; 1,230 feet north and 60 feet east of the southwest corner of sec. 28, T. 1 S., R. 11 W.

Ap—0 to 8 inches; grayish brown (10YR 5/2) silt loam, light gray (10YR 7/2) dry; many fine distinct dark yellowish brown (10YR 4/4) mottles; weak fine subangular blocky structure; friable; many fine roots; medium acid; clear smooth boundary.

Bg—8 to 17 inches; gray (10YR 5/1) silt loam; many fine prominent strong brown (7.5YR 5/6) mottles; weak fine prismatic structure; friable; common fine roots; few black (10YR 2/1) accumulations of iron and manganese oxide; very strongly acid; gradual smooth boundary.

Cg1—17 to 30 inches; light brownish gray (10YR 6/2) silt loam; common fine prominent strong brown (7.5YR 5/6) mottles; massive; friable; common fine roots; few black (10YR 2/1) accumulations of iron and manganese oxide; very strongly acid; abrupt smooth boundary.

Cg2—30 to 60 inches; grayish brown (2.5Y 5/2) silt loam; many fine prominent dark yellowish brown (10YR 4/4) mottles; massive; friable; common fine roots; medium acid.

The control section ranges from very strongly acid to mildly alkaline. It ranges from 18 to 27 percent clay.

The A horizon has value of 4 or 5 and chroma of 1 or 2. The Bg horizon has hue of 10YR, 2.5Y, or 5Y, value of 5 or 6, and chroma of 1 or 2. The Cg horizon has hue of 10YR, 2.5Y, or 5Y, value of 5 to 7, and chroma of 1 or 2. Some pedons have strata of fine sand or coarser sand below a depth of 40 inches.

Chagrin Series

The Chagrin series consists of deep, well drained, moderately permeable soils on bottom land. These soils formed in silty and loamy alluvium. Slopes range from 0 to 2 percent.

Chagrin soils are commonly near Haymond, Moundhaven, Nolin, and Wirt soils. The nearby soils are in landscape positions similar to those of the Chagrin soils. Haymond soils have less sand and less clay than the Chagrin soils, Moundhaven and Wirt soils have more sand, and Nolin soils have less sand.

Typical pedon of Chagrin silt loam, frequently flooded, in an idle field; 1,920 feet west and 110 feet south of the northeast corner of sec. 33, T. 1 S., R. 12 W.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak medium subangular blocky structure; friable; many fine and medium roots; neutral; clear smooth boundary.

Bw1—6 to 27 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine prismatic structure parting to coarse medium subangular blocky; friable; many fine and medium roots; few faint brown (10YR 4/3) organic coatings on faces of peds; slightly acid; gradual smooth boundary.

Bw2—27 to 36 inches; yellowish brown (10YR 5/4) loam; moderate fine subangular blocky structure; friable; few fine roots; few faint dark yellowish brown (10YR 4/4) organic coatings on faces of peds; neutral; clear smooth boundary.

Bw3—36 to 46 inches; dark yellowish brown (10YR 4/4) sandy loam; weak fine subangular blocky structure parting to moderate very fine granular; very friable; slightly acid; clear smooth boundary.

C—46 to 60 inches; dark yellowish brown (10YR 4/4) sand; weak very fine granular structure; loose; slightly acid.

The solum is 24 to 48 inches thick. Reaction is medium acid to neutral throughout the profile.

The Ap horizon has chroma of 2 or 3. It is silt loam or loam. The Bw horizon has chroma of 3 or 4. It is silt loam in the upper part and loam or sandy loam in the lower part. The C horizon has value of 4 or 5 and chroma of 3 or 4. It is dominantly sand, but in some pedons it is stratified with silt loam, loam, sandy loam, or loamy sand.

Crawleyville Series

The Crawleyville series consists of deep, somewhat poorly drained, moderately permeable soils on river terraces. These soils formed in loamy sediments. Slopes range from 0 to 2 percent.

Crawleyville soils are similar to Ayrshire Variant soils and are commonly near Skelton and Vincennes soils. Ayrshire Variant soils have less clay than the Crawleyville soils. They are on uplands. Skelton soils do not have grayish colors in the subsoil. They are in the slightly higher landscape positions. Vincennes soils are dominantly grayish throughout. They are in the slightly lower landscape positions.

Typical pedon of Crawleyville loam, in a cultivated field; 2,140 feet south and 64 feet east of the center of sec. 21, T. 2 S., R. 12 W.

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) loam, light brownish gray (10YR 6/2) dry; moderate fine subangular blocky structure; friable; common fine roots; medium acid; abrupt smooth boundary.

BE—9 to 12 inches; brown (10YR 5/3) sandy clay loam; few fine faint grayish brown (10YR 5/2) mottles; weak fine subangular blocky structure; friable; common fine roots; few black (10YR 2/1) accumulations of iron and manganese oxide; medium acid; clear smooth boundary.

Bt—12 to 19 inches; yellowish brown (10YR 5/6) sandy clay loam; common fine distinct light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; friable; few fine roots; thin continuous grayish brown (10YR 5/2) clay films on faces of peds; medium acid; gradual smooth boundary.

Btg1—19 to 29 inches; light brownish gray (10YR 6/2) sandy clay loam; common fine prominent yellowish brown (10YR 5/6) mottles; weak medium prismatic structure parting to weak fine subangular blocky; friable; few fine roots; thin continuous light brownish gray (10YR 6/2) clay films on faces of peds; many medium prominent strong brown (7.5YR 5/6) iron and manganese oxide accumulations and stains; very strongly acid; gradual smooth boundary.

Btg2—29 to 37 inches; light brownish gray (10YR 6/2) sandy clay loam; many medium prominent strong brown (7.5YR 5/6) mottles; weak medium prismatic structure parting to weak fine subangular blocky; friable; few fine roots; thin discontinuous light gray (10YR 6/1) clay films on faces of peds; common brown (7.5YR 4/4) accumulations of iron and

manganese oxide; very strongly acid; gradual smooth boundary.

Btg3—37 to 45 inches; light brownish gray (10YR 6/2) fine sandy loam; many medium prominent strong brown (7.5YR 5/6) mottles; weak medium prismatic structure parting to weak fine subangular blocky; friable; few fine roots; thin discontinuous light gray (10YR 6/1) clay films on faces of peds; common brown (7.5YR 4/4) accumulations of iron and manganese oxide; very strongly acid; gradual smooth boundary.

BCg—45 to 50 inches; light gray (10YR 7/2) fine sandy loam; many fine prominent brown (7.5YR 4/4) mottles; weak fine subangular blocky structure; friable; few black (10YR 2/1) and brown (7.5YR 4/4) accumulations of iron and manganese oxide; very strongly acid; gradual smooth boundary.

Cg—50 to 60 inches; light gray (10YR 7/2) fine sandy loam; common fine prominent brown (7.5YR 4/4) mottles; massive; friable; common brown (7.5YR 4/4) accumulations of iron and manganese oxide; very strongly acid.

The solum is 40 to 60 inches thick. The Ap and BE horizons have value of 4 or 5 and chroma of 2 or 3. The Bt horizon has value of 5 to 7 and chroma of 1 to 6. It is fine sandy loam, loam, sandy loam, or sandy clay loam. It is very strongly acid to medium acid in the upper part and very strongly acid or strongly acid in the lower part. The C horizon has value of 5 to 7 and chroma of 1 or 2. It is fine sandy loam or sandy loam. It is strongly acid or very strongly acid.

Elkinsville Series

The Elkinsville series consists of deep, well drained, moderately permeable soils on river terraces. These soils formed in alluvium. Slopes range from 0 to 6 percent.

The Elkinsville soils in this county have a base saturation that is higher than is definitive for the series. This difference does not alter the use and management of the soils.

Elkinsville soils are commonly near Crawleyville, Skelton, and Vincennes soils. Crawleyville and Vincennes soils have a grayish subsoil. They are in the lower landscape positions. Skelton soils have more sand than the Elkinsville soils. They are in landscape positions similar to those of the Elkinsville soils.

Typical pedon of Elkinsville silt loam, 0 to 2 percent slopes, in a cultivated field; 2,180 feet east and 1,650 feet north of the southwest corner of sec. 18, T. 1 S., R. 11 W.

Ap—0 to 10 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine granular structure; friable; many fine roots; slightly acid; clear smooth boundary.

Bt1—10 to 18 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine subangular blocky structure; friable; many fine roots; thin continuous brown (10YR 4/3) clay films on faces of peds; strongly acid; gradual smooth boundary.

Bt2—18 to 26 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; friable; many fine roots; thin continuous brown (10YR 4/3) clay films on faces of peds; very strongly acid; gradual smooth boundary.

2Bt3—26 to 35 inches; yellowish brown (10YR 5/6) silty clay loam; weak fine prismatic structure parting to moderate medium subangular blocky; friable; few fine roots; thin continuous dark yellowish brown (10YR 4/4) clay films on faces of peds; very strongly acid; gradual smooth boundary.

2Bt4—35 to 46 inches; yellowish brown (10YR 5/6) silty clay loam; weak fine prismatic structure parting to moderate medium subangular blocky; friable; thin continuous dark yellowish brown (10YR 4/4) clay films and few distinct brown (10YR 5/3) silt coatings on faces of peds; very strongly acid; gradual smooth boundary.

2Bt5—46 to 63 inches; yellowish brown (10YR 5/6) silty clay loam; few fine faint light yellowish brown (10YR 6/4) mottles; weak medium prismatic structure parting to moderate fine subangular blocky; friable; thin discontinuous dark yellowish brown (10YR 4/4) clay films and few distinct brown (10YR 5/3) silt coatings on faces of peds; very strongly acid; gradual smooth boundary.

2Bt6—63 to 74 inches; dark yellowish brown (10YR 4/4) silty clay loam; common fine distinct pale brown (10YR 6/3) mottles; weak medium prismatic structure parting to weak fine subangular blocky; friable; thin patchy brown (10YR 4/3) clay films on faces of peds; strongly acid; gradual smooth boundary.

2C—74 to 80 inches; yellowish brown (10YR 5/6) silty clay loam; many medium distinct pale brown (10YR 6/3) mottles; massive; friable; common black (10YR 2/1) iron and manganese oxide stains; strongly acid.

The solum is 40 to 80 inches thick. It ranges from neutral to very strongly acid.

The A horizon has value of 4 or 5 and chroma of 2 to 4. The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 8. It is silt loam or silty clay loam. The 2Bt horizon has colors similar to those of the Bt horizon. It is silt loam, loam, silty clay loam, or clay loam. The C horizon has value of 4 or 5 and chroma of 4 to 6. It is loam, sandy loam, silty clay loam, or silt loam.

Evansville Series

The Evansville series consists of deep, poorly drained, moderately permeable soils on lacustrine plains. These

soils formed in silty lakebed sediments. Slopes range from 0 to 2 percent.

Evansville soils are commonly near Ragsdale, Reesville, and Uniontown soils. Ragsdale soils have a surface layer that is thicker and darker than that of the Evansville soils. They are in landscape positions similar to those of the Evansville soils. Reesville and Uniontown soils have a subsoil that is browner than that of the Evansville soils. They are in the higher landscape positions.

Typical pedon of Evansville silt loam, in a cultivated field; 245 feet north and 170 feet east of the southwest corner of donation 16, T. 1 S., R. 10 W.

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) silt loam, light gray (10YR 6/1) dry; weak fine subangular blocky structure; friable; few fine roots; few faint dark gray (10YR 4/1) organic coatings on faces of peds; neutral; gradual smooth boundary.

A—9 to 18 inches; dark grayish brown (10YR 4/2) silt loam, light gray (10YR 6/1) dry; few fine distinct dark yellowish brown (10YR 4/4) mottles; weak fine subangular blocky structure; friable; few fine roots; neutral; clear smooth boundary.

Bg1—18 to 26 inches; gray (10YR 5/1) silt loam; many fine prominent yellowish brown (10YR 5/6) mottles; weak medium prismatic structure parting to weak medium subangular blocky; friable; neutral; clear smooth boundary.

Bg2—26 to 40 inches; dark gray (10YR 4/1) silt loam; common fine prominent yellowish brown (10YR 5/6) and common fine faint grayish brown (10YR 5/2) mottles; weak medium prismatic structure parting to weak medium subangular blocky; friable; neutral; clear smooth boundary.

Cg1—40 to 56 inches; grayish brown (2.5Y 5/2) silt loam; common medium prominent strong brown (7.5YR 5/8) mottles; massive; firm; large dark gray (10YR 4/1) krotovinas; neutral; gradual smooth boundary.

Cg2—56 to 65 inches; light brownish gray (2.5Y 6/2) silt loam; many medium prominent strong brown (7.5YR 5/8) mottles; massive; firm; common black (10YR 2/1) concretions of iron and manganese oxide; neutral.

The solum is 40 to 50 inches thick. It is slightly acid to mildly alkaline. The content of clay in the control section is 20 to 34 percent.

The A horizon has value of 4 or 5. The Bg and C horizons are silt loam or silty clay loam. The Bg horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, and chroma of 1 or 2. The C horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, and chroma of 1 to 4.

Fairpoint Series

The Fairpoint series consists of deep, well drained, moderately slowly permeable soils in upland areas that have been surface mined. These soils formed in ungraded spoil material. Slopes range from 15 to 60 percent.

Fairpoint soils are commonly near Gudgel and Hosmer soils. The nearby soils have a fragipan and do not have coarse fragments in the solum. They are in undisturbed areas.

Typical pedon of Fairpoint shaly silt loam, 15 to 60 percent slopes, in an area of woodland; 150 feet south and 2,600 feet east of the northwest corner of sec. 26, T. 2 S., R. 9 W.

A—0 to 5 inches; dark grayish brown (10YR 4/2) shaly silt loam, light brownish gray (10YR 6/2) dry; weak medium platy structure parting to weak very fine subangular blocky; friable; many fine and medium roots; about 30 percent shale fragments; neutral; gradual wavy boundary.

C1—5 to 31 inches; dark grayish brown (10YR 4/2) extremely shaly silt loam; massive; friable; common medium roots; about 80 percent shale fragments; neutral; gradual wavy boundary.

C2—31 to 60 inches; dark grayish brown (10YR 4/2) extremely shaly silt loam; massive; friable; few medium roots; about 80 percent shale fragments; neutral.

The depth to bedrock is more than 60 inches. Reaction is neutral to medium acid throughout the profile. In the control section, the content of shale fragments ranges from 50 to 80 percent and the content of sandstone fragments is less than 5 percent.

The A and C horizons have value of 4 or 5 and chroma of 1 to 4. The A horizon is the shaly or very shaly analogs of silt loam or loam. The C horizon is the extremely shaly to shaly analogs of silt loam or loam.

Gilpin Variant

The Gilpin Variant consists of moderately deep, well drained, moderately permeable soils on side slopes in the uplands. These soils formed in loess and in the underlying sandstone and shale residuum. Slopes range from 18 to 50 percent.

Gilpin Variant soils are commonly near Alford and Taftown soils. Both of the nearby soils have bedrock at a depth of more than 40 inches. Taftown soils are in landscape positions similar to those of the Gilpin Variant soils. Alford soils are in the higher positions.

Typical pedon of Gilpin Variant silt loam, 18 to 50 percent slopes, in an area of hardwoods; 1,260 feet south and 1,210 feet west of the northeast corner of sec. 9, T. 2 S., R. 10 W.

A—0 to 3 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; weak fine granular structure; friable; many fine and medium roots; medium acid; clear smooth boundary.
E—3 to 8 inches; brown (10YR 5/3) silt loam; weak thin platy structure parting to weak very fine granular; friable; many fine and medium roots; medium acid; gradual smooth boundary.
Bt1—8 to 16 inches; yellowish brown (10YR 5/6) silt loam; weak fine subangular blocky structure; friable; common fine roots; thin patchy yellowish brown (10YR 5/4) clay films on faces of peds; strongly acid; gradual smooth boundary.
2Bt2—16 to 29 inches; yellowish brown (10YR 5/6) loam; moderate fine subangular blocky structure; friable; common fine and medium roots; thin patchy yellowish brown (10YR 5/4) clay films on faces of peds; about 5 percent sandstone fragments; strongly acid; gradual smooth boundary.
2BC—29 to 34 inches; yellowish brown (10YR 5/4) silt loam; weak fine granular structure; friable; few fine and medium roots; about 10 percent sandstone fragments; slightly acid; gradual smooth boundary.
2Cr—34 inches; interbedded, soft, weathered, neutral sandstone and shale.

The solum is 15 to 36 inches thick. It is strongly acid to neutral. The depth to residuum is 8 to 24 inches. The depth to bedrock is 20 to 36 inches.

The A horizon has value of 3 or 4 and chroma of 1 to 3. The E horizon has value of 4 or 5 and chroma of 3 or 4. The Bt horizon has value of 5 or 6 and chroma of 4 to 6.

Gudgel Series

The Gudgel series consists of deep, moderately well drained soils on side slopes in the uplands. These soils formed in loess and in the underlying sandstone and shale residuum. Permeability is moderate in the upper part of the profile and slow in the lower part. Slopes range from 6 to 18 percent.

Gudgel soils are similar to Hosmer soils and are commonly near Hosmer and Taftown soils. Hosmer soils do not have residuum within a depth of 60 inches. They are in the higher landscape positions. Taftown soils do not have a fragipan. They are in the lower landscape positions.

Typical pedon of Gudgel silt loam, 12 to 18 percent slopes, severely eroded, in an idle field; 160 feet east and 300 feet south of the center of sec. 16, T. 2 S., R. 9 W.

Ap—0 to 6 inches; yellowish brown (10YR 5/6) silt loam, light yellowish brown (10YR 6/4) dry; weak fine subangular blocky structure; friable; common fine roots; slightly acid; clear smooth boundary.
Bt—6 to 12 inches; yellowish brown (10YR 5/6) silt loam; moderate fine subangular blocky structure; friable; common fine roots; thin discontinuous yellowish brown (10YR 5/4) clay films on faces of peds; strongly acid; gradual smooth boundary.
Btx—12 to 29 inches; yellowish brown (10YR 5/6) silt loam; few fine distinct light brownish gray (10YR 6/2) mottles; weak coarse and very coarse prismatic structure parting to moderate medium angular and subangular blocky; very firm; thin discontinuous strong brown (7.5YR 5/6) clay films on faces of peds; many black (10YR 2/1) iron and manganese oxide stains; medium acid; gradual smooth boundary.
2Bt1—29 to 43 inches; dark yellowish brown (10YR 4/4) silty clay loam; many fine distinct pale brown (10YR 6/3) mottles; weak fine prismatic structure parting to moderate medium subangular blocky; firm; thin continuous dark yellowish brown (10YR 4/4) clay films on faces of peds; many black (10YR 2/1) iron and manganese oxide stains; neutral; gradual smooth boundary.
2Bt2—43 to 51 inches; dark yellowish brown (10YR 4/4) silty clay loam; many fine distinct pale brown (10YR 6/3) mottles; weak fine prismatic structure parting to moderate medium subangular blocky; firm; thin continuous dark yellowish brown (10YR 4/4) clay films on faces of peds; many black (10YR 2/1) iron and manganese oxide stains; about 10 percent shale fragments; neutral; gradual smooth boundary.
2Cr—51 to 60 inches; soft, neutral, interbedded shale and sandstone.

The solum is 40 to 60 inches thick. The depth to the fragipan is 10 to 14 inches.

The Ap horizon has value of 4 or 5 and generally has chroma of 4 to 6. In uneroded and moderately eroded areas, however, it has value of 4 and chroma of 2 or 3 or value of 5 and chroma of 3. The Bt and Btx horizons are very strongly acid to medium acid. The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. The Btx horizon has value of 4 or 5 and chroma of 4 to 6. The 2Bt horizon has value of 4 to 6 and chroma of 4 to 8. In some pedons it has low-chroma mottles. It is neutral or slightly acid.

Haymond Series

The Haymond series consists of deep, well drained, moderately permeable soils on bottom land. These soils formed in silty alluvium. Slopes range from 0 to 2 percent.

Haymond soils are commonly near Lindside, Newark, Nolin, Wakeland, and Wilbur soils. Lindside and Nolin soils have more clay in the subsoil than the Haymond soils. They are in the slightly lower landscape positions.

Newark, Wakeland, and Wilbur soils have grayish mottles. They are in the lower landscape positions.

Typical pedon of Haymond silt loam, frequently flooded, in a cultivated field; 610 feet west and 450 feet south of the northeast corner of sec. 28, T. 1 S., R. 10 W.

Ap—0 to 8 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine subangular blocky structure parting to weak very fine granular; friable; few fine roots; thin discontinuous dark grayish brown (10YR 4/2) organic coatings on faces of peds; neutral; clear smooth boundary.

Bw1—8 to 16 inches; dark yellowish brown (10YR 4/4) silt loam; moderate fine subangular blocky structure; few fine roots; few faint dark grayish brown (10YR 4/2) organic coatings on faces of peds; neutral; gradual smooth boundary.

Bw2—16 to 45 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine prismatic structure parting to weak fine subangular; friable; neutral; gradual smooth boundary.

C—45 to 60 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine subangular blocky structure; friable; neutral.

The solum is 40 to 70 inches thick. It is medium acid to neutral.

The Ap horizon has value of 4 or 5 and chroma of 2 to 4. The Bw and C horizons have value of 4 to 6 and chroma of 3 or 4. The C horizon is silt loam, loam, or fine sandy loam.

Henshaw Variant

The Henshaw Variant consists of deep, somewhat poorly drained, moderately slowly permeable soils on low stream terraces. These soils formed in silty sediments. Slopes range from 0 to 2 percent.

Henshaw Variant soils are similar to Iva and Reesville soils and are commonly near Petrolia soils. Iva soils are more acid than the Henshaw Variant soils, and Reesville soils are deeper to carbonates. Petrolia soils are dominantly grayish throughout. They are in the lower landscape positions.

Typical pedon of Henshaw Variant silt loam, 0 to 2 percent slopes, frequently flooded, in a cultivated field; 1,720 feet north and 400 feet west of the southeast corner of sec. 24, T. 1 S., R. 10 W.

Ap—0 to 7 inches; brown (10YR 5/3) silt loam, pale brown (10YR 6/3) dry; weak fine subangular blocky structure; friable; few fine roots; neutral; abrupt smooth boundary.

Bt1—7 to 11 inches; yellowish brown (10YR 5/6) silt loam; many medium distinct light brownish gray (10YR 6/2) mottles; moderate fine and medium subangular blocky structure; firm; few fine roots; thin continuous light brownish gray (10YR 6/2) clay films on faces of peds; slightly acid; gradual smooth boundary.

Bt2—11 to 15 inches; yellowish brown (10YR 5/6) silty clay loam; many medium distinct light brownish gray (10YR 6/2) mottles; moderate fine and medium subangular blocky structure; firm; few fine roots; thin continuous light brownish gray (10YR 6/2) clay films on faces of peds; neutral; clear smooth boundary.

Btg—15 to 20 inches; grayish brown (10YR 5/2) silty clay loam; many fine prominent yellowish brown (10YR 5/8) mottles; weak fine prismatic structure parting to moderate medium subangular blocky; firm; few fine roots; thin continuous grayish brown (10YR 5/2) clay films on faces of peds; many black (10YR 2/1) accumulations of iron and manganese oxide; slightly acid; gradual smooth boundary.

B't—20 to 35 inches; yellowish brown (10YR 5/6) silty clay loam; many medium prominent grayish brown (10YR 5/2) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; firm; thin continuous grayish brown (10YR 5/2) clay films on faces of peds; many black (10YR 2/1) accumulations of iron and manganese oxide; neutral; clear smooth boundary.

BCg—35 to 40 inches; grayish brown (10YR 5/2) silty clay loam; many medium prominent yellowish brown (10YR 5/8) mottles; weak fine prismatic structure; friable; many black (10YR 2/1) accumulations of iron and manganese oxide; neutral; clear smooth boundary.

Cg—40 to 60 inches; light brownish gray (10YR 6/2) silt loam; many medium prominent yellowish brown (10YR 5/8) mottles; massive; friable; many concretions of calcium carbonate; strong effervescence; moderately alkaline.

The solum is 30 to 60 inches thick. The depth to carbonates is 36 to 55 inches.

The Ap horizon has value of 4 or 5 and chroma of 2 or 3. Some pedons have an E horizon. This horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. It is slightly acid to neutral. The Bt horizon has value of 4 to 6 and chroma of 2 to 8. It is medium acid to neutral. The C horizon has value of 5 or 6 and chroma of 2 to 6. It is silt loam or silt and is mildly alkaline or moderately alkaline.

Hosmer Series

The Hosmer series consists of deep, moderately well drained and well drained soils in the uplands. These soils formed in silty loess. Permeability is moderate in the upper part of the solum and very slow in the lower part. Slopes range from 2 to 12 percent.

Hosmer soils are similar to Gudgel soils and are commonly near Alford, Gudgel, and Muren soils. The

nearby soils are in landscape positions similar to those of the Hosmer soils. Alford and Muren soils do not have a fragipan. Gudgel soils have sandstone and shale residuum within a depth of 60 inches.

Typical pedon of Hosmer silt loam, 2 to 6 percent slopes, eroded, in an idle field; 1,340 feet west and 290 feet south of the northeast corner of sec. 5, T. 3 S., R. 8 W.

Ap—0 to 8 inches; brown (10YR 4/3) silt loam, light yellowish brown (10YR 6/4) dry; mixed with some yellowish brown (10YR 5/6) subsoil material; weak fine granular structure; friable; many fine roots; medium acid; abrupt smooth boundary.

Bt1—8 to 15 inches; yellowish brown (10YR 5/6) silt loam; moderate fine subangular blocky structure; friable; common fine roots; thin discontinuous brown (7.5YR 4/4) clay films on faces of peds; few black (10YR 2/1) accumulations of iron and manganese oxide; very strongly acid; gradual smooth boundary.

Bt2—15 to 23 inches; yellowish brown (10YR 5/6) silt loam; moderate fine and medium subangular blocky structure; friable; common fine roots; thin discontinuous yellowish brown (10YR 5/4) clay films on faces of peds; many distinct very pale brown (10YR 7/4) silt coatings on vertical faces of peds; very strongly acid; gradual wavy boundary.

Bx1—23 to 30 inches; strong brown (7.5YR 5/6) silty clay loam; weak medium and coarse prismatic structure; firm; somewhat brittle; common fine roots; thin discontinuous brown (7.5YR 4/4) clay films on faces of peds; many distinct light brownish gray (10YR 6/2) silt coatings on vertical faces of peds; few black (10YR 2/1) accumulations of iron and manganese oxide; very strongly acid; gradual wavy boundary.

Bx2—30 to 80 inches; dark yellowish brown (10YR 4/4) silt loam; common fine distinct light brownish gray (10YR 6/2) and yellowish brown (10YR 5/8) mottles; weak very coarse prismatic structure; very firm; brittle; few fine roots between peds; thin discontinuous dark brown (7.5YR 4/4) clay films on faces of peds; many distinct light brownish gray (10YR 6/2) silt coatings on vertical faces of peds; few black (10YR 2/1) accumulations of iron and manganese oxide within silt coatings; very strongly acid.

The solum is 60 to more than 80 inches thick. The depth to the Bx horizon is 20 to 30 inches.

The Ap horizon has value of 4 or 5 and chroma of 2 or 3. Unless limed, it ranges from very strongly acid to slightly acid. Pedons in undisturbed areas have an A horizon, which has hue of 10YR, value of 3 or 4, and chroma of 1 to 3. Some pedons have an E horizon, which has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. The Bt and Bx horizons are silt loam or silty clay loam. The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. It is very strongly acid or strongly acid. The Bx horizon has hue of 10YR or 7.5YR and value and chroma of 4 to 6. It is very strongly acid to medium acid.

Iva Series

The Iva series consists of deep, somewhat poorly drained, moderately permeable soils on stream terraces. These soils formed in loess. Slopes range from 0 to 4 percent.

Iva soils are similar to Henshaw Variant and Reesville soils and are commonly near Alford, Hosmer, and Peoga soils. Henshaw Variant and Reesville soils are less acid in the subsoil than the Iva soils. Alford and Hosmer soils do not have grayish colors in the upper part of the subsoil. They are in the higher landscape positions. Peoga soils are dominantly grayish throughout the subsoil. They are in the slightly lower landscape positions.

Typical pedon of Iva silt loam, 0 to 2 percent slopes, in a cultivated field; 500 feet south and 1,210 feet east of the northwest corner of sec. 4, T. 3 S., R. 10 W.

Ap—0 to 11 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine subangular blocky structure; friable; few fine roots; few black (10YR 2/1) concretions of iron and manganese oxide on faces of peds; neutral; abrupt smooth boundary.

E—11 to 18 inches; brown (10YR 5/3) silt loam; many fine distinct light brownish gray (10YR 6/2) mottles; weak medium platy structure parting to moderate very fine subangular blocky; friable; few fine roots; strongly acid; clear smooth boundary.

Bt1—18 to 27 inches; yellowish brown (10YR 5/6) silt loam; common medium distinct light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; friable; few fine roots; thin continuous grayish brown (10YR 5/2) clay films on faces of peds; few distinct white (10YR 8/1) silt coatings on faces of peds and in root channels; strongly acid; gradual smooth boundary.

Bt2—27 to 37 inches; yellowish brown (10YR 5/6) silty clay loam; common medium distinct light brownish gray (10YR 6/2) mottles; weak fine prismatic structure parting to moderate medium subangular blocky; firm; thin continuous light gray (10YR 6/1) clay films on faces of peds; few distinct white (10YR 8/1) silt coatings on faces of peds and in root channels; very strongly acid; gradual smooth boundary.

BC—37 to 49 inches; yellowish brown (10YR 5/6) silt loam; common fine distinct light gray (10YR 7/1) mottles; moderate thick platy structure; firm; common black (10YR 2/1) accumulations of iron and manganese oxide; very strongly acid; gradual smooth boundary.

C—49 to 60 inches; yellowish brown (10YR 5/6) silt loam; few fine distinct light gray (10YR 7/1) mottles; massive; friable; strongly acid.

The solum is 48 to 60 inches thick. The Ap horizon has value of 4 or 5 and chroma of 2 or 3. The E horizon has value of 5 or 6 and chroma of 2 or 3. It is strongly acid or medium acid. The Bt horizon has chroma of 3 to 6. It is very strongly acid to slightly acid. The C horizon has value of 5 or 6 and chroma of 2 to 6. It is strongly acid to slightly acid.

Junius Variant

The Junius Variant consists of deep, poorly drained, moderately permeable soils in depressions on uplands. These soils formed in sandy and loamy alluvium. Slopes range from 0 to 2 percent.

Junius Variant soils are commonly near Alvin, Ayrshire Variant, and Bloomfield soils. Alvin and Bloomfield soils do not have grayish colors below the surface layer. They are in the higher landscape positions. Ayrshire Variant soils are dominantly brownish in the upper part of the subsoil. They are in the slightly higher landscape positions.

Typical pedon of Junius Variant loamy sand, in a cultivated field; 2,560 feet north and 1,480 feet west of the southeast corner of sec. 23, T. 1 S., R. 11 W.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) loamy sand, light brownish gray (10YR 6/2) dry; weak fine subangular blocky structure; very friable; many fine roots; neutral; abrupt smooth boundary.

E—8 to 14 inches; light brownish gray (10YR 6/2) loamy fine sand; few fine distinct yellowish brown (10YR 5/6) mottles; weak fine subangular blocky structure; very friable; few fine roots; few distinct dark grayish brown (10YR 4/2) organic coatings on faces of peds; neutral; gradual smooth boundary.

BE—14 to 19 inches; light brownish gray (10YR 6/2) loamy fine sand; common fine prominent brown (7.5YR 4/4) mottles and iron stains; weak fine subangular blocky structure; very friable; neutral; gradual smooth boundary.

Bg1—19 to 33 inches; light gray (10YR 7/1) sandy loam; many coarse and medium prominent brown (7.5YR 4/4) mottles; weak medium subangular blocky structure; friable; neutral; gradual smooth boundary.

Bg2—33 to 46 inches; light gray (10YR 7/1) sandy loam; many coarse and medium prominent brown (7.5YR 4/4) mottles; weak medium prismatic structure parting to weak medium subangular blocky; friable; neutral; gradual smooth boundary.

Cg—46 to 60 inches; light gray (10YR 7/1) fine sand; many coarse prominent brown (7.5YR 4/4) mottles; massive; very friable; few black (10YR 2/1) concretions of iron and manganese oxide; thin strata of silt loam and sandy loam; neutral.

The solum is 30 to 60 inches thick. It is neutral or slightly acid.

The Ap horizon has value of 4 or 5 and chroma of 2 or 3. The E and Bg horizons have hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. The E horizon is loamy sand or loamy fine sand. The Bg horizon is sandy loam or fine sandy loam. The Cg horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2. It is sand or fine sand.

Landes Series

The Landes series consists of deep, well drained soils on bottom land. These soils formed in loamy and sandy alluvium. Permeability is moderately rapid in the upper part of the profile and rapid in the lower part. Slopes range from 0 to 2 percent.

Landes soils are commonly near Armiesburg, Medway, and Skelton soils. The nearby soils are in landscape positions similar to those of the Landes soils. They have more clay in the control section than the Landes soils. Also, Skelton soils do not have a dark surface layer.

Typical pedon of Landes sandy loam, occasionally flooded, in a cultivated field; 246 feet west and 492 feet south of the northeast corner of sec. 35, T. 1 S., R. 12 W.

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) sandy loam, grayish brown (10YR 5/2) dry; weak fine subangular blocky structure; very friable; many fine roots; about 3 percent coarse fragments as much as 5 millimeters in diameter; neutral; clear smooth boundary.

A—8 to 16 inches; very dark grayish brown (10YR 3/2) sandy loam, grayish brown (10YR 5/2) dry; weak fine subangular blocky structure; very friable; few fine roots; about 3 percent pebbles as much as 0.25 inch in diameter; neutral; gradual smooth boundary.

BA—16 to 23 inches; brown (7.5YR 4/4) sandy loam; weak medium subangular blocky structure parting to weak fine subangular blocky; very friable; few fine roots; few distinct dark brown (10YR 3/3) organic coatings on faces of peds; about 3 percent pebbles as much as 0.25 inch in diameter; neutral; gradual smooth boundary.

Bw—23 to 40 inches; brown (7.5YR 4/4) sandy loam; weak fine subangular blocky structure; very friable; few fine roots; few distinct brown (10YR 4/3) organic coatings on faces of peds; about 12 percent pebbles as much as 0.25 inch in diameter; neutral; clear smooth boundary.

BC—40 to 54 inches; brown (7.5YR 4/4) loamy sand; weak fine subangular blocky structure; very friable; few fine roots; about 12 percent pebbles as much as 0.75 inch in diameter; slightly acid; clear smooth boundary.

C—54 to 70 inches; yellowish brown (10YR 5/6) sand; single grain; very friable; about 4 percent pebbles as much as 0.75 inch in diameter; neutral.

The solum is 30 to 60 inches thick. The content of gravel is 0 to 15 percent throughout the profile. The soils range from moderately alkaline to slightly acid throughout.

The A horizon has value of 2 or 3 and chroma of 1 to 3. The BA and Bw horizons have hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 3 or 4. They are loamy fine sand, fine sandy loam, loamy sand, or sandy loam. Some pedons have mottles with chroma of 2 in the lower part of the B horizon or in the C horizon. The C horizon has value of 4 or 5 and chroma of 3 to 6. It is sand or is stratified silt loam, loam, sandy loam, fine sandy loam, loamy fine sand, fine sand, or sand.

Lindside Series

The Lindside series consists of deep, moderately well drained, moderately permeable and moderately slowly permeable soils on bottom land. These soils formed in silty alluvium. Slopes range from 0 to 2 percent.

Lindside soils are commonly near Newark, Nolin, and Wilhite soils. Newark soils are slightly lower on the landscape than the Lindside soils. Also, they have grayish mottles closer to the surface. Nolin soils do not have grayish mottles. They are in the higher landscape positions. Wilhite soils have a dominantly grayish subsoil. They are in the lower landscape positions.

Typical pedon of Lindside silt loam, frequently flooded, in a cultivated field; 1,558 feet west and 164 feet south of the northeast corner of sec. 19, T. 3 S., R. 13 W.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; moderate medium subangular blocky structure; friable; common fine roots; neutral; abrupt smooth boundary.

Bw1—7 to 18 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine prismatic structure parting to moderate fine subangular blocky; friable; common fine roots; few faint brown (10YR 4/3) organic coatings on faces of peds; neutral; gradual smooth boundary.

Bw2—18 to 34 inches; dark yellowish brown (10YR 4/4) silt loam; few fine faint dark brown (10YR 4/3) mottles; weak fine prismatic structure parting to moderate fine subangular blocky; friable; few fine roots; few faint dark grayish brown (10YR 4/2) organic coatings on faces of peds; neutral; gradual smooth boundary.

Bw3—34 to 60 inches; dark yellowish brown (10YR 4/4) silt loam; common fine and medium distinct grayish brown (10YR 5/2) mottles; weak fine prismatic structure parting to moderate medium angular blocky; friable; few fine roots; few faint dark grayish brown (10YR 4/2) organic coatings on faces of peds; neutral; gradual smooth boundary.

Cg—60 to 70 inches; grayish brown (10YR 5/2) silt loam; many medium distinct dark yellowish brown (10YR 4/4) mottles; massive; friable; neutral.

The solum is 35 to about 60 inches thick. It ranges from strongly acid to mildly alkaline. The soils are silt loam or silty clay loam throughout.

The A horizon has chroma of 2 or 3. The B horizon has value of 4 or 5 and chroma of 3 or 4. The C horizon has value of 4 to 6 and chroma of 2 or 3.

Lyles Series

The Lyles series consists of deep, very poorly drained soils on river terraces. These soils formed in loamy and sandy lacustrine material. Permeability generally is moderate in the solum and moderately rapid in the underlying material. The loamy substratum phase, however, is moderately permeable throughout. Slopes range from 0 to 2 percent.

Lyles soils are commonly near Patton, Rensselaer, and Vincennes soils. The nearby soils have more clay than the Lyles soils. They are in landscape positions similar to those of the Lyles soils.

Typical pedon of Lyles fine sandy loam, in a cultivated field; 2,220 feet north and 490 feet east of the southwest corner of sec. 10, T. 2 S., R. 11 W.

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) fine sandy loam, gray (10YR 5/1) dry; weak very fine granular structure; friable; many fine roots; strongly acid; abrupt smooth boundary.

A1—10 to 24 inches; very dark gray (10YR 3/1) fine sandy loam, dark gray (10YR 4/1) dry; weak fine subangular blocky structure; very friable; many fine roots; slightly acid; gradual smooth boundary.

A2—24 to 36 inches; very dark gray (10YR 3/1) fine sandy loam, gray (10YR 5/1) dry; few fine faint dark yellowish brown (10YR 4/4) mottles; weak fine subangular blocky structure; very friable; common fine roots; slightly acid; gradual smooth boundary.

Bg—36 to 51 inches; dark gray (10YR 4/1) fine sandy loam; common fine faint dark yellowish brown (10YR 4/4) mottles; weak fine subangular blocky structure; friable; few reddish brown (5YR 4/4) iron and manganese oxide stains; slightly acid; gradual smooth boundary.

Cg—51 to 60 inches; light gray (10YR 6/1) loamy fine sand; many medium prominent reddish brown (5YR 4/4) mottles; massive; friable; few reddish brown (5YR 4/4) concretions of iron and manganese oxide; slightly acid.

The solum is 40 to 62 inches thick. The A horizon has value of 2 or 3. It is silt loam, loam, sandy loam, or fine

sandy loam. It is strongly acid to neutral. It is 10 to 40 inches thick. The Bg horizon has value of 4 or 5. It is loam, sandy loam, or fine sandy loam. The C horizon has value of 4 to 7 and chroma of 1 or 2. It is dominantly loamy fine sand, but it has strata of fine sandy loam, sandy loam, or sand below a depth of 60 inches. Also, a loamy substratum phase is mapped in the county.

Maplehill Series

The Maplehill series consists of deep, somewhat poorly drained, moderately permeable soils along drainageways on bottom land and lake plains. These soils formed in recent alluvium and in silty lacustrine material. Slopes range from 0 to 2 percent.

Maplehill soils are similar to Wakeland soils and are commonly near Evansville, Ragsdale, and Wakeland soils. The nearby soils are in positions on the landscape similar to those of the Maplehill soils. Evansville and Wakeland soils do not have a buried solum within 36 inches of the surface. Ragsdale soils have a dark surface layer or have less than 20 inches of moderately dark overwash underlain by a dark buried surface layer.

Typical pedon of Maplehill silt loam, frequently flooded, in a cultivated field; 1,025 feet west and 290 feet south of the center of sec. 17, T. 2 S., R. 10 W.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine granular structure; friable; few fine roots; slightly acid; gradual smooth boundary.

Cg—8 to 26 inches; dark grayish brown (10YR 4/2) silt loam; few fine faint grayish brown (10YR 5/2) mottles; weak fine subangular blocky structure; friable; few fine roots; dark yellowish brown (10YR 4/4) iron and manganese oxide stains; neutral; abrupt smooth boundary.

Ab1—26 to 34 inches; very dark grayish brown (10YR 3/2) silt loam; about 10 percent brown (10YR 5/3) silt loam; weak fine prismatic structure parting to weak fine granular; friable; few fine roots; neutral; clear smooth boundary.

Ab2—34 to 47 inches; very dark gray (10YR 3/1) silt loam; weak medium subangular blocky structure; friable; common fine roots; neutral; gradual smooth boundary.

Bgb1—47 to 63 inches; dark gray (10YR 4/1) silt loam; common fine distinct yellowish brown (10YR 5/4) mottles; weak fine prismatic structure parting to weak fine subangular blocky; friable; few fine roots; neutral; gradual smooth boundary.

Bgb2—63 to 80 inches; gray (10YR 5/1) silt loam; many medium prominent yellowish brown (10YR 5/6) mottles; weak fine prismatic structure; friable; few fine roots; few dark gray (10YR 4/1) krotovinas; neutral.

The medium textured alluvium is 20 to 36 inches deep over the Ab horizon. The content of clay in the control section is 12 to 18 percent. Reaction is slightly acid or neutral in the Ap, Cg, and Ab horizons and neutral to moderately alkaline in the Bgb and Cgb horizons.

The Ap and Cg horizons have value of 4 or 5 and chroma of 2 or 3. The Ab horizon has value of 2 or 3. The Bgb horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 1 or 2. Some pedons have a Cgb horizon within a depth of 80 inches. This horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. It is silt loam or silty clay loam.

Medway Series

The Medway series consists of deep, moderately well drained, moderately permeable soils on bottom land and low river terraces. These soils formed in outwash and alluvium. Slopes range from 0 to 2 percent.

The Medway soils in this county are deeper to low-chroma mottles than is definitive for the series. This difference does not alter the use and management of the soils.

Medway soils are commonly near Armiesburg, Landes, Skelton, and Vincennes soils. Armiesburg, Landes, and Skelton soils are in landscape positions similar to those of the Medway soils. Armiesburg soils have less sand than the Medway soils, and Landes soils have less clay. Skelton soils do not have a dark surface layer. Vincennes soils have a grayish subsoil. They are in depressions.

Typical pedon of Medway loam, occasionally flooded, in a cultivated field; 700 feet west and 100 feet north of the southeast corner of sec. 16, T. 1 S., R. 11 W.

Ap—0 to 6 inches; very dark gray (10YR 3/1) loam, grayish brown (10YR 5/2) dry; weak fine subangular blocky structure; friable; common fine roots; mildly alkaline; gradual smooth boundary.

A—6 to 19 inches; very dark gray (10YR 3/1) loam, gray (10YR 5/1) dry; moderate medium angular and subangular blocky structure; friable; common fine roots; neutral; gradual smooth boundary.

BA—19 to 27 inches; yellowish brown (10YR 5/4) clay loam; weak fine prismatic structure parting to moderate medium subangular blocky; friable; common fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; neutral; gradual smooth boundary.

Bt—27 to 35 inches; yellowish brown (10YR 5/6) loam; weak medium prismatic structure parting to moderate medium subangular blocky; firm; few fine roots; thin discontinuous brown (10YR 5/3) clay films on faces of peds; few distinct dark grayish brown (10YR 4/2) organic coatings on faces of peds; neutral; gradual smooth boundary.

Btg1—35 to 46 inches; grayish brown (10YR 5/2) sandy clay loam; common fine prominent dark brown (7.5YR 4/4) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; firm; thin continuous grayish brown (10YR 5/2) clay films on faces of peds; neutral; gradual smooth boundary.

Btg2—46 to 57 inches; grayish brown (10YR 5/2) sandy clay loam; many fine prominent strong brown (7.5YR 5/6) mottles; weak medium platy structure; firm; thin discontinuous gray (10YR 5/1) clay films on faces of peds; neutral; gradual smooth boundary.

Cg—57 to 70 inches; grayish brown (10YR 5/2) sandy clay loam; common fine prominent strong brown (7.5YR 5/6) mottles; massive; firm; common black (10YR 2/1) accumulations of iron and manganese oxide; neutral.

The solum is 40 to 60 inches thick. The content of clay in the control section is 18 to 32 percent.

The Ap and A horizons have value of 2 or 3 and chroma of 1 to 3. They are silt loam, loam, or clay loam and are slightly acid to mildly alkaline. The B horizon is loam, sandy clay loam, or clay loam. The part of this horizon within a depth of 30 inches has value of 4 or 5 and chroma of 2 to 6. It is slightly acid to mildly alkaline. The part of the B horizon below a depth of 30 inches and the C horizon have value of 4 to 6 and chroma of 2 to 6. They range from slightly acid to moderately alkaline. The C horizon is loam, sandy loam, sandy clay loam, or clay loam.

Montgomery Series

The Montgomery series consists of deep, very poorly drained, slowly permeable soils on river terraces. These soils formed in lacustrine silty clay and silty clay loam. Slopes range from 0 to 2 percent.

Montgomery soils are commonly near Lyles, Patton, Rensselaer, and Zipp soils. The nearby soils are in landscape positions similar to those of the Montgomery soils. Lyles and Rensselaer soils have more sand and less clay than the Montgomery soils, and Patton soils have less clay. Zipp soils do not have a dark surface layer.

Typical pedon of Montgomery silty clay loam, in a cultivated field; 1,900 feet west and 45 feet north of the center of sec. 25, T. 3 S., R. 13 W.

Ap—0 to 8 inches; very dark gray (10YR 3/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine subangular blocky structure; friable; few fine roots; neutral; abrupt smooth boundary.

A—8 to 22 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; weak fine prismatic structure parting to moderate medium angular blocky; firm; few fine roots; common brown (7.5YR 4/4) iron and manganese oxide stains and concretions; about 1 percent pebbles less than 0.5 inch in diameter; neutral; clear smooth boundary.

Bg1—22 to 34 inches; dark gray (10YR 4/1) silty clay; many medium prominent brown (7.5YR 4/4) mottles; weak fine prismatic structure parting to moderate medium subangular blocky; firm; few fine roots; small slickensides on faces of peds; about 1 percent pebbles less than 0.5 inch in diameter; neutral; abrupt wavy boundary.

Bg2—34 to 48 inches; light gray (5Y 6/1) silty clay; few medium prominent yellowish brown (10YR 5/6) mottles; weak fine prismatic structure; firm; few fine roots; small slickensides on faces of some peds; about 1 percent pebbles less than 0.5 inch in diameter; mildly alkaline; gradual smooth boundary.

Cg—48 to 60 inches; gray (10YR 5/1) silty clay loam; common medium distinct light olive brown (2.5Y 5/4) mottles; massive; firm; mildly alkaline.

The solum is 32 to 60 inches thick. The soils are silty clay loam or silty clay throughout.

The A horizon has value of 2 or 3 and chroma of 1 or 2. The Bg horizon has hue of 10YR, 5Y, or 2.5Y, value of 4 to 6, and chroma of 1 or 2. It is slightly acid to mildly alkaline. The Cg horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2. It is mildly alkaline or moderately alkaline.

Moundhaven Series

The Moundhaven series consists of deep, somewhat excessively drained, rapidly permeable soils on bottom land. These soils formed in sandy alluvium. Slopes range from 0 to 2 percent.

The Moundhaven soils in this county are taxadjuncts to the series because they do not have thin strata of finer textured material. This difference does not alter the use and management of the soils.

Moundhaven soils are commonly near Chagrin, Haymond, Nolin, and Wirt soils. The nearby soils are in landscape positions similar to those of the Moundhaven soils. Chagrin and Wirt soils have less sand than the Moundhaven soils, and Haymond and Nolin soils have less sand and more clay in the control section and do not have free carbonates within a depth of 40 inches.

Typical pedon of Moundhaven fine sandy loam, frequently flooded, in an idle field; 1,070 feet west and 10 feet south of the northeast corner of sec. 20, T. 1 N., R. 10 W.

Ap—0 to 9 inches; yellowish brown (10YR 5/4) fine sandy loam, light yellowish brown (10YR 6/4) dry; weak very fine granular structure; very friable; few fine roots; thin strata of very dark grayish brown (10YR 3/2) material; slight effervescence; moderately alkaline; clear smooth boundary.

C1—9 to 14 inches; yellowish brown (10YR 5/4) loamy fine sand; weak very fine granular structure; very friable; few fine roots; slight effervescence; moderately alkaline; clear smooth boundary.
C2—14 to 38 inches; light yellowish brown (10YR 6/4) fine sand; single grain; very friable; slight effervescence; moderately alkaline; clear smooth boundary.
C3—38 to 44 inches; yellowish brown (10YR 5/4) fine sand; single grain; very friable; slight effervescence; moderately alkaline; clear smooth boundary.
C4—44 to 56 inches; light yellowish brown (10YR 6/4) sand; single grain; loose; slight effervescence; moderately alkaline; clear smooth boundary.
C5—56 to 61 inches; yellowish brown (10YR 5/4) sand; single grain; very friable; slight effervescence; moderately alkaline; clear smooth boundary.
C6—61 to 70 inches; very pale brown (10YR 7/3) loamy fine sand; single grain; loose; slight effervescence; moderately alkaline.

Free carbonates are throughout the profile. The Ap horizon has value of 4 or 5 and chroma of 3 or 4. The C horizon has value of 4 to 7 and chroma of 3 or 4. It is dominantly sand, fine sand, or loamy fine sand, but in some pedons it has strata of fine sandy loam.

Muren Series

The Muren series consists of deep, moderately well drained, moderately permeable soils on the tops of ridges in the uplands. These soils formed in loess. Slopes range from 0 to 6 percent.

Muren soils are commonly near Alford, Hosmer, Iva, and Reesville soils. Alford and Hosmer soils do not have grayish mottles in the upper part of the subsoil. They are in landscape positions similar to those of the Muren soils. Iva and Reesville soils have a subsoil that is grayer than that of the Muren soils. They are in small depressions.

Typical pedon of Muren silt loam, 2 to 6 percent slopes, eroded, in a cultivated field; 3,130 feet north and 40 feet west of the southeast corner of donation 125, T. 1 S., R. 10 W.

Ap—0 to 9 inches; brown (10YR 5/3) silt loam, pale brown (10YR 6/3) dry; mixed with some yellowish brown (10YR 5/6) subsoil material; weak very fine granular structure; friable; common fine roots; neutral; abrupt smooth boundary.
Bt1—9 to 17 inches; yellowish brown (10YR 5/6) silt loam; few fine prominent light brownish gray (10YR 6/2) mottles; moderate fine subangular blocky structure; friable; common fine roots; thin discontinuous yellowish brown (10YR 5/4) clay films on faces of peds; few distinct light brownish gray (10YR 6/2) silt coatings on faces of peds; medium acid; gradual smooth boundary.
Bt2—17 to 32 inches; yellowish brown (10YR 5/6) silty clay loam; common fine prominent light brownish gray (10YR 6/2) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; firm; few fine roots; thin continuous yellowish brown (10YR 5/4) clay films on faces of peds; few black (10YR 2/1) accumulations of iron and manganese oxide; medium acid; gradual smooth boundary.
Bt3—32 to 39 inches; yellowish brown (10YR 5/6) silt loam; common fine prominent light brownish gray (10YR 6/2) mottles; weak thick platy structure parting to weak medium subangular blocky; firm; thin discontinuous brown (10YR 5/3) clay films on faces of peds; common black (10YR 2/1) accumulations of iron and manganese oxide; slightly acid; gradual smooth boundary.
BC—39 to 54 inches; yellowish brown (10YR 5/6) silt loam; many fine prominent grayish brown (10YR 5/2) mottles; weak medium platy structure; firm; common black (10YR 2/1) accumulations of iron and manganese oxide; neutral; gradual smooth boundary.
C—54 to 80 inches; yellowish brown (10YR 5/6) silt loam; many medium prominent grayish brown (10YR 5/2) mottles; massive; friable; neutral.

The solum is 40 to 60 inches thick. The Ap horizon has value of 4 or 5 and chroma of 2 or 3. The Bt horizon has value and chroma of 4 to 6. Mottles having chroma of 2 or less are in the upper 10 inches of the argillic horizon. This horizon ranges from strongly acid to neutral. The C horizon has value of 4 to 7 and chroma of 3 to 6. It is medium acid to neutral.

Newark Series

The Newark series consists of deep, somewhat poorly drained, moderately permeable soils on bottom land. These soils formed in silty alluvium. Slopes range from 0 to 2 percent.

Newark soils are commonly near Haymond, Lindside, Nolin, and Wilhite soils. Haymond, Lindside, and Nolin soils do not have grayish mottles in the upper part of the subsoil. They are in the slightly higher landscape positions. Wilhite soils have a dominantly grayish subsoil. They are in the slightly lower landscape positions.

Typical pedon of Newark silty clay loam, frequently flooded, in an idle field; 1,485 feet east and 820 feet north of the southwest corner of sec. 22, T. 1 N., R. 10 W.

Ap—0 to 9 inches; brown (10YR 4/3) silty clay loam, pale brown (10YR 6/3) dry; moderate fine granular; friable; common fine roots; mildly alkaline; gradual smooth boundary.

Bw—9 to 19 inches; dark yellowish brown (10YR 4/4) silty clay loam; many medium distinct grayish brown (10YR 5/2) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; firm; few faint dark grayish brown (10YR 4/2) organic coatings on faces of peds; few fine and medium roots; mildly alkaline; gradual smooth boundary.

Bg1—19 to 29 inches; grayish brown (10YR 5/2) silt loam; many medium distinct dark yellowish brown (10YR 4/4) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; firm; few faint dark grayish brown (10YR 4/2) organic coatings on faces of peds; mildly alkaline; gradual smooth boundary.

Bg2—29 to 45 inches; grayish brown (10YR 5/2) silty clay loam; many medium distinct dark yellowish brown (10YR 4/4) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; firm; few faint dark grayish brown (10YR 4/2) organic coatings on faces of peds; mildly alkaline; gradual smooth boundary.

Bg3—45 to 60 inches; grayish brown (10YR 5/2) silty clay loam; many fine distinct dark yellowish brown (10YR 4/4) mottles; weak fine prismatic structure parting to moderate medium subangular blocky; friable; few faint grayish brown (10YR 5/2) organic coatings on faces of peds; neutral; gradual smooth boundary.

Bg4—60 to 80 inches; grayish brown (10YR 5/2) silt loam; many fine distinct dark yellowish brown (10YR 4/4) mottles; weak very fine prismatic structure parting to weak fine subangular blocky; friable; neutral.

The solum is 40 to more than 80 inches thick. It is silt loam or silty clay loam. It ranges from medium acid to mildly alkaline.

The Ap horizon has value of 4 or 5 and chroma of 2 or 3. The Bw horizon has value of 4 or 5 and chroma of 3 or 4. The Bg horizon has value of 4 to 7 and chroma of 1 or 2. Some pedons have a C horizon. This horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. It is dominantly silt loam or silty clay loam, but some pedons have strata of loam or fine sandy loam.

Nolin Series

The Nolin series consists of deep, well drained, moderately permeable soils on bottom land. These soils formed in silty alluvium. Slopes range from 0 to 2 percent.

Nolin soils are commonly near Armiesburg, Haymond, Lindside, Newark, and Wilhite soils. Armiesburg soils have a dark surface layer. They are in landscape positions similar to those of the Nolin soils. Haymond soils have less clay in the subsoil than the Nolin soils. They are in the slightly higher landscape positions. Lindside, Newark, and Wilhite soils have grayish colors in the subsoil. They are in the lower landscape positions.

Typical pedon of Nolin silt loam, frequently flooded, in a cultivated field; 48 feet south and 150 feet west of the center of sec. 36, T. 1 N., R. 11 W.

Ap—0 to 10 inches; dark grayish brown (10YR 4/2) silt loam, pale brown (10YR 6/3) dry; weak fine subangular blocky structure; friable; many fine roots; mildly alkaline; clear smooth boundary.

Bw1—10 to 38 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine prismatic structure parting to moderate fine subangular blocky; friable; common fine roots; few faint dark grayish brown (10YR 4/2) organic coatings on faces of peds; neutral; gradual smooth boundary.

Bw2—38 to 61 inches; yellowish brown (10YR 5/4) silt loam; weak fine prismatic structure parting to moderate medium subangular blocky; friable; few fine roots; few faint brown (10YR 4/3) organic coatings on faces of peds; neutral; gradual smooth boundary.

Bw3—61 to 68 inches; yellowish brown (10YR 5/4) silt loam; weak very fine prismatic structure parting to weak fine subangular blocky; friable; few fine roots; few faint brown (10YR 5/3) organic coatings on faces of peds; neutral; gradual smooth boundary.

Bw4—68 to 80 inches; dark yellowish brown (10YR 4/4) silt loam; many medium distinct pale brown (10YR 6/3) and few medium prominent light brownish gray (10YR 6/2) mottles; weak very fine prismatic structure parting to weak fine granular; friable; few fine roots; neutral.

The solum is 40 to more than 80 inches thick. It ranges from medium acid to moderately alkaline.

The Ap horizon has value of 4 or 5 and chroma of 2 or 3. The Bw horizon has chroma of 3 or 4. It is silt loam or silty clay loam. Some pedons have a C horizon. This horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. It is stratified silt loam, loam, fine sandy loam, or sandy loam.

Parke Series

The Parke series consists of deep, well drained, moderately permeable soils on uplands. These soils formed in silty loess and in the underlying glacial outwash. Slopes range from 18 to 50 percent.

Parke soils are commonly near Alford and Taftown soils. Alford soils do not have glacial outwash within a depth of 60 inches. They are in the higher landscape positions. Taftown soils have residuum or bedrock at a depth of 40 to 60 inches. They are in the lower landscape positions.

Typical pedon of Parke silt loam, in a wooded area of Alford-Parke silt loams, 18 to 50 percent slopes; 1,400

feet north and 120 feet west of the southeast corner of sec. 5, T. 2 S., R. 10 W.

A—0 to 2 inches; very dark gray (10YR 3/1) silt loam, light brownish gray (10YR 6/2) dry; weak fine subangular blocky structure; friable; many fine roots; neutral; abrupt smooth boundary.

E—2 to 8 inches; yellowish brown (10YR 5/4) silt loam; weak medium subangular blocky structure; friable; many fine roots; few distinct dark grayish brown (10YR 4/2) organic coatings on faces of peds; medium acid; gradual smooth boundary.

Bt1—8 to 27 inches; yellowish brown (10YR 5/6) silt loam; moderate medium subangular blocky structure; friable; common fine and medium roots; thin continuous yellowish brown (10YR 5/4) clay films on faces of peds; medium acid; clear smooth boundary.

2Bt2—27 to 38 inches; yellowish red (5YR 4/6) loam; weak fine prismatic structure parting to moderate fine subangular blocky; friable; few fine and medium roots; thin discontinuous yellowish brown (10YR 5/4) clay films on faces of peds; medium acid; gradual smooth boundary.

2Bt3—38 to 53 inches; red (2.5YR 4/6) loam; weak fine prismatic structure parting to moderate fine subangular blocky; friable; few fine roots; thin discontinuous brown (7.5YR 5/4) clay films on faces of peds; about 1 percent pebbles as much as 0.5 inch in diameter; medium acid; gradual smooth boundary.

2Bt4—53 to 74 inches; red (2.5YR 4/6) loam; weak fine prismatic structure parting to moderate fine subangular blocky; friable; few fine roots; thin patchy brown (7.5YR 5/4) clay films on faces of peds; few black (10YR 2/1) accumulations of iron and manganese oxide; about 1 percent pebbles as much as 0.5 inch in diameter; medium acid; clear smooth boundary.

2C—74 to 80 inches; yellowish red (5YR 5/6) loam; common fine distinct brownish yellow (10YR 6/6) mottles; massive; friable; few black (10YR 2/1) accumulations of iron and manganese oxide; about 1 percent pebbles as much as 0.5 inch in diameter; medium acid.

The solum is 48 to more than 80 inches thick. The loess is 20 to 40 inches thick.

The A horizon has value of 3 or 4 and chroma of 1 to 3. The E horizon has value of 4 or 5 and chroma of 3 or 4. It is medium acid or strongly acid. The Bt, 2Bt, and 2C horizons are medium acid to very strongly acid. The Bt horizon has chroma of 4 to 6. The 2Bt horizon has value of 4 or 5 and chroma of 4 to 6. It is loam or sandy clay loam. The 2C horizon has hue of 7.5YR or 5YR, value of 4 or 5, and chroma of 4 to 6. It is loam or sandy loam.

Patton Series

The Patton series consists of deep, poorly drained soils on lacustrine plains and river terraces. These soils formed in silty lakebed and slack-water sediments. Permeability is moderate in the solum and moderately slow in the underlying material. Slopes range from 0 to 2 percent.

Patton soils are commonly near Lyles and Rensselaer soils. The nearby soils have more sand than the Patton soils. They are in landscape positions similar to those of the Patton soils.

Typical pedon of Patton silty clay loam, in a cultivated field; 985 feet north and 40 feet west of the southeast corner of sec. 8, T. 2 S., R. 11 W.

Ap—0 to 9 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; moderate fine subangular blocky structure; firm; many fine roots; neutral; clear smooth boundary.

A—9 to 23 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; weak fine prismatic structure parting to moderate medium subangular and angular blocky; firm; many fine roots; few faint black (10YR 2/1) organic coatings on faces of peds; few fine dark brown (7.5YR 4/4) iron concretions and stains; neutral; gradual smooth boundary.

Bg1—23 to 38 inches; dark gray (10YR 4/1) silty clay loam; many fine distinct dark brown (7.5YR 4/4) mottles; weak fine prismatic structure parting to moderate fine subangular blocky; firm; few fine roots; few distinct black (10YR 2/1) organic coatings on faces of peds; neutral; gradual smooth boundary.

Bg2—38 to 57 inches; gray (10YR 5/1) silt loam; many coarse prominent strong brown (7.5YR 5/8) mottles; weak medium prismatic structure; firm; few fine roots; few faint dark gray (10YR 4/1) organic coatings on faces of peds; large black (10YR 2/1) krotovinas; neutral; clear smooth boundary.

Cg1—57 to 61 inches; gray (10YR 5/1) silt loam; common fine distinct light olive brown (2.5Y 5/4) mottles; massive; slightly sticky; few fine roots; mildly alkaline; gradual smooth boundary.

Cg2—61 to 70 inches; gray (10YR 5/1) silt loam; many medium distinct light olive brown (2.5Y 5/4) mottles; massive; slightly sticky; few fine roots; slight effervescence; mildly alkaline.

The solum is 40 to 60 inches thick. It has chroma of 1 or 2. The A horizon is silt loam or silty clay loam. The Bg horizon is slightly acid to mildly alkaline. The Cg horizon has hue of 10YR, 2.5Y, or 5Y and chroma of 1 or 2. It is silt loam or silty clay loam. It is mildly alkaline or moderately alkaline.

Peoga Series

The Peoga series consists of deep, poorly drained, slowly permeable soils on terraces. These soils formed in silty material. Slopes range from 0 to 2 percent.

Peoga soils are commonly near Hosmer and Iva soils. Hosmer soils are dominantly brownish in the subsoil. They are in the higher landscape positions. Iva soils are dominantly brownish in the upper part of the subsoil. They are in the slightly higher landscape positions.

Typical pedon of Peoga silt loam, in a cultivated field; 285 feet south and 1,215 feet east of the northwest corner of sec. 4, T. 3 S., R. 10 W.

Ap—0 to 11 inches; grayish brown (10YR 5/2) silt loam, light gray (10YR 7/2) dry; weak fine subangular blocky structure; friable; few fine roots; few black (10YR 2/1) iron and manganese oxide stains; slightly acid; abrupt smooth boundary.

E—11 to 19 inches; light gray (10YR 6/1) silt loam; common fine distinct dark yellowish brown (10YR 4/4) mottles; weak medium platy structure parting to weak fine subangular blocky; friable; few fine roots; slightly acid; gradual smooth boundary.

Btg1—19 to 33 inches; light gray (10YR 7/1) silt loam; common fine distinct yellowish brown (10YR 5/6) mottles; moderate fine subangular blocky structure; friable; few fine roots; thin discontinuous light gray (10YR 6/1) clay films on faces of peds; very strongly acid; gradual smooth boundary.

Btg2—33 to 47 inches; light gray (10YR 7/1) silt loam; common fine distinct strong brown (7.5YR 5/6) mottles; weak fine prismatic structure parting to moderate medium subangular blocky; firm; thin continuous light gray (10YR 6/1) clay films on faces of peds; few black (10YR 2/1) accumulations of iron and manganese oxide; strongly acid; gradual smooth boundary.

Btg3—47 to 57 inches; light gray (10YR 6/1) silt loam; many medium distinct yellowish brown (10YR 5/6) mottles; weak fine prismatic structure parting to moderate medium subangular blocky; firm; thin continuous light gray (10YR 6/1) clay films on faces of peds; few black (10YR 2/1) accumulations of iron and manganese oxide; strongly acid; gradual smooth boundary.

BCg—57 to 65 inches; light gray (10YR 7/1) silt loam; many medium distinct yellowish brown (10YR 5/6) mottles; moderate fine subangular blocky structure; firm; common black (10YR 2/1) accumulations of iron and manganese oxide; strongly acid; gradual smooth boundary.

Cg—65 to 75 inches; light gray (10YR 6/1) silt loam; many coarse distinct strong brown (7.5YR 5/8) mottles; massive; firm; few black (10YR 2/1) iron and manganese oxide stains; medium acid.

The solum is 48 to 80 inches thick. The Ap horizon has value of 4 or 5. The E and Btg horizons are strongly acid or very strongly acid. The E horizon has value of 5 or 6 and chroma of 1 or 2. The Btg and Cg horizons have hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. They are silt loam or silty clay loam. The Cg horizon ranges from slightly acid to very strongly acid.

Petrolia Series

The Petrolia series consists of deep, poorly drained, moderately slowly permeable soils on bottom land. These soils formed in silty alluvium. Slopes range from 0 to 2 percent.

Petrolia soils are similar to Birds and Bonnie soils and are commonly near Birds, Henshaw Variant, Steff, and Stendal soils. Birds and Bonnie soils have less clay than the Petrolia soils. They are in the smaller drainageways. Henshaw Variant, Steff, and Stendal soils are dominantly brownish in the upper part of the subsoil. They are in the slightly higher landscape positions.

Typical pedon of Petrolia silt loam, frequently flooded, in a cultivated field; 80 feet east and 1,650 feet south of the center of sec. 24, T. 1 S., R. 10 W.

A—0 to 11 inches; dark grayish brown (10YR 4/2) silt loam, light grayish brown (10YR 6/2) dry; weak fine subangular blocky structure; friable; few fine roots; slightly acid; abrupt smooth boundary.

Bg1—11 to 22 inches; gray (10YR 5/1) silty clay loam; many fine prominent light olive brown (2.5Y 5/6) mottles; weak fine prismatic structure parting to moderate fine subangular blocky; friable; few fine roots; neutral; gradual smooth boundary.

Bg2—22 to 33 inches; gray (10YR 5/1) silty clay loam; many fine prominent light olive brown (2.5Y 5/6) mottles; weak fine prismatic structure parting to moderate fine subangular blocky; firm; few fine roots; neutral; clear smooth boundary.

Bg3—33 to 46 inches; light gray (10YR 6/1) silty clay loam; many fine prominent yellowish brown (10YR 5/8) mottles; weak fine prismatic structure parting to moderate fine subangular blocky; friable; few fine roots; mildly alkaline; gradual smooth boundary.

Cg—46 to 60 inches; light brownish gray (10YR 6/2) silty clay loam; many coarse prominent strong brown (7.5YR 5/8) mottles; massive; friable; few fine roots; mildly alkaline.

The solum is 30 to 80 inches thick. It ranges from medium acid to moderately alkaline. The content of clay in the control section is 27 to 35 percent.

The A horizon has value of 4 or 5 and chroma of 1 or 2. The A and Cg horizons are silt loam or silty clay loam. The Bg and Cg horizons have hue of 10YR, 2.5Y, or 5Y and value of 5 or 6. The Cg horizon has chroma of 1 within a depth of 40 inches and chroma of 1 or 2 below

a depth of 40 inches. It ranges from very strongly acid to mildly alkaline.

Ragsdale Series

The Ragsdale series consists of deep, very poorly drained, moderately permeable soils on lake plains. These soils formed in lacustrine sediments. Slopes range from 0 to 2 percent.

The Ragsdale soils in this county are taxadjuncts to the series because they do not have an argillic horizon. This difference does not alter the use and management of the soils.

Ragsdale soils are commonly near Evansville, Maplehill, Reesville, and Uniontown soils. Evansville, Reesville, and Uniontown soils do not have a dark surface layer. Evansville soils are in landscape positions similar to those of the Ragsdale soils. Reesville and Uniontown soils are in the slightly higher positions. Maplehill soils have overwash that is lighter colored than that of the Ragsdale soils. They are in landscape positions similar to those of the Ragsdale soils.

Typical pedon of Ragsdale silt loam, in a cultivated field; 750 feet south and 945 feet east of the northwest corner of donation 104, T. 1 S., R. 10 W.

Ap—0 to 9 inches; very dark gray (10YR 3/1) silt loam, dark gray (10YR 4/1) dry; weak fine subangular blocky structure parting to moderate fine granular; friable; few fine roots; slightly acid; gradual smooth boundary.

A—9 to 20 inches; very dark gray (10YR 3/1) silt loam, dark gray (10YR 4/1) dry; weak fine subangular blocky structure parting to weak medium granular; friable; few fine roots; neutral; clear smooth boundary.

Btg1—20 to 29 inches; grayish brown (10YR 5/2) silt loam; many medium prominent yellowish brown (10YR 5/8) mottles; moderate fine subangular blocky structure; friable; thin discontinuous grayish brown (10YR 5/2) clay films on faces of peds; few faint dark gray (10YR 4/1) organic coatings on faces of peds; neutral; clear smooth boundary.

Btg2—29 to 43 inches; dark gray (10YR 4/1) silt loam; common medium prominent yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; thin discontinuous dark gray (10YR 4/1) clay films on faces of peds; very dark gray (10YR 3/1) krotovinas; neutral; clear smooth boundary.

Btg3—43 to 56 inches; light brownish gray (2.5Y 6/2) silt loam; many coarse prominent yellowish brown (10YR 5/8) mottles; weak medium prismatic structure parting to weak fine subangular blocky; friable; thin patchy gray (10YR 5/1) clay films on faces of peds; neutral; gradual smooth boundary.

Cg—56 to 60 inches; light brownish gray (2.5Y 6/2) silt loam; many coarse prominent yellowish brown (10YR 5/8) mottles; massive; friable; slight effervescence; mildly alkaline.

The solum is 40 to 60 inches thick. The A horizon has value of 2 or 3 and chroma of 1 or 2. The Btg horizon has hue of 10YR, 2.5Y, or 5Y. It is silt loam or silty clay loam. It is neutral or slightly acid. The Cg horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 6. It is mildly alkaline or moderately alkaline.

Reesville Series

The Reesville series consists of deep, somewhat poorly drained, moderately permeable soils on lake plains. These soils formed in silty lakebed sediments. Slopes range from 0 to 2 percent.

Reesville soils are similar to Henshaw Variant and Iva soils and are commonly near Evansville, Ragsdale, and Uniontown soils. Henshaw Variant soils commonly are shallower to carbonates than the Reesville soils. Iva soils are more acid in the solum than the Reesville soils. Evansville and Ragsdale soils have a dominantly grayish subsoil. They are in the lower landscape positions. Uniontown soils have a dominantly brownish subsoil. They are in landscape positions similar to those of the Reesville soils or are in the slightly higher positions.

Typical pedon of Reesville silt loam, 0 to 2 percent slopes, in a cultivated field; 420 feet east and 30 feet south of the northwest corner of donation 1, T. 1 S., R. 10 W.

Ap—0 to 10 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine subangular blocky structure; friable; few fine roots; medium acid; clear smooth boundary.

E—10 to 21 inches; light brownish gray (10YR 6/2) silt loam; few fine distinct yellowish brown (10YR 5/6) mottles; weak fine subangular blocky structure; friable; few fine roots; slightly acid; gradual smooth boundary.

Bt—21 to 27 inches; yellowish brown (10YR 5/6) silt loam; common fine distinct and prominent light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; friable; thin discontinuous grayish brown (10YR 5/2) clay films on faces of peds; thin patchy light brownish gray (10YR 6/2) silt coatings on faces of peds; few black (10YR 2/1) accumulations of iron oxide; slightly acid; gradual smooth boundary.

Btg—27 to 40 inches; grayish brown (10YR 5/2) silt loam; many medium prominent dark yellowish brown (10YR 4/4) mottles; moderate medium subangular blocky structure; firm; thin discontinuous grayish brown (10YR 5/2) clay films on faces of peds; common black (10YR 2/1) accumulations of iron oxide; slightly acid; gradual smooth boundary.

B't—40 to 52 inches; yellowish brown (10YR 5/6) silt loam; few fine prominent light brownish gray (10YR 6/2) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; firm; thin discontinuous grayish brown (10YR 5/2) clay films on faces of peds; common black (10YR 2/1) accumulations of iron oxide; slightly acid; gradual smooth boundary.

C—52 to 60 inches; light olive brown (2.5Y 5/6) silt loam; many medium prominent grayish brown (10YR 5/2) mottles; massive; friable; neutral.

The solum is 40 to 60 inches thick. The Ap horizon has value of 4 or 5 and chroma of 2 or 3. The E horizon has value of 5 or 6 and chroma of 2 to 4. It ranges from strongly acid to neutral. The B horizon has chroma of 2 to 6. It is silt loam or silty clay loam. It ranges from strongly acid to mildly alkaline. The C horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2 to 6. It is neutral to moderately alkaline.

Rensselaer Series

The Rensselaer series consists of deep, very poorly drained, moderately permeable soils on river terraces. These soils formed in loamy sediments. Slopes range from 0 to 2 percent.

The Rensselaer soils in this county are taxadjuncts to the series because they do not have an argillic horizon. This difference does not alter the use and management of the soils.

Rensselaer soils are commonly near Adrian, Lyles, Montgomery, Patton, and Vincennes soils. Adrian soils formed in organic material over sand. They are in the slightly lower areas. Lyles, Montgomery, Patton, and Vincennes soils are in landscape positions similar to those of the Rensselaer soils. Lyles soils have less clay throughout the solum than the Rensselaer soils, Montgomery soils have more clay in the control section, and Patton soils have less sand in the solum. Vincennes soils do not have a mollic epipedon.

Typical pedon of Rensselaer fine sandy loam, loamy substratum, in a cultivated field; 2,470 feet west and 580 feet south of the northeast corner of sec. 6, T. 3 S., R. 12 W.

Ap—0 to 9 inches; very dark gray (10YR 3/1) fine sandy loam, gray (10YR 5/1) dry; moderate fine subangular blocky structure; friable; few fine roots; medium acid; gradual smooth boundary.

A—9 to 19 inches; very dark gray (10YR 3/1) sandy clay loam, gray (10YR 5/1) dry; moderate medium subangular blocky structure; friable; few fine roots; slightly acid; gradual smooth boundary.

Btg1—19 to 28 inches; dark gray (10YR 4/1) sandy clay loam; weak fine prismatic structure parting to weak medium subangular blocky; friable; few fine roots; few faint dark gray (10YR 4/1) organic coatings on faces of peds; thin patchy grayish brown (10YR 5/2) clay films on faces of peds; about 5 percent pebbles as much as 0.25 inch in diameter; neutral; gradual smooth boundary.

Btg2—28 to 42 inches; gray (10YR 5/1) sandy clay loam; many fine faint light brownish gray (10YR 6/2) mottles; weak fine prismatic structure parting to weak medium subangular blocky; friable; thin patchy gray (10YR 5/1) clay films on faces of peds; about 5 percent pebbles as much as 0.25 inch in diameter; neutral; gradual smooth boundary.

BCg—42 to 52 inches; dark gray (N 4/0) sandy loam; many medium distinct gray (N 5/0) mottles; weak fine prismatic structure parting to weak medium subangular blocky; friable; thin patchy gray (10YR 5/1) clay films on faces of peds; about 5 percent pebbles as much as 0.25 inch in diameter; neutral; clear smooth boundary.

Cg—52 to 60 inches; gray (5Y 5/1) loam; many medium prominent strong brown (7.5YR 5/8) mottles; massive; firm; neutral.

The solum is 40 to 60 inches thick. The A horizon has value of 2 or 3 and chroma of 1 or 2. It is loam, mucky loam, clay loam, fine sandy loam, or sandy clay loam. The Btg horizon has hue of 10YR, 2.5Y, or 5Y or is neutral in hue. It has chroma of 0 to 2. It commonly is sandy clay loam, but the range includes loam and clay loam. The Cg horizon has colors similar to those of the Bg horizon. It commonly is loam, but some pedons are stratified with silty clay loam, sandy loam, or sandy clay loam.

Skelton Series

The Skelton series consists of deep, well drained, moderately permeable soils on low river terraces. These soils formed in loamy and silty sediments. Slopes range from 0 to 2 percent.

Skelton soils are commonly near Crawleyville, Elkinsville, Medway, and Vincennes soils. Crawleyville and Vincennes soils have a subsoil that is grayer than that of the Skelton soils. They are in the lower landscape positions. Elkinsville and Medway soils are in positions similar to those of the Skelton soils. Elkinsville soils have less sand than the Skelton soils, and Medway soils have a darker surface layer.

Typical pedon of Skelton loam, 0 to 2 percent slopes, in a cultivated field; 690 feet north and 959 feet west of the southeast corner of sec. 33, T. 1 S., R. 12 W.

Ap—0 to 11 inches; dark grayish brown (10YR 4/2) loam, light brownish gray (10YR 6/2) dry; moderate fine subangular blocky structure; friable; many fine roots; neutral; abrupt smooth boundary.

Bt1—11 to 17 inches; yellowish brown (10YR 5/6) clay loam; weak medium and fine subangular blocky

structure; friable; common fine roots; thin discontinuous yellowish brown (10YR 5/4) clay films on faces of peds; few distinct dark grayish brown (10YR 4/2) organic coatings on faces of peds; strongly acid; gradual smooth boundary.

Bt2—17 to 30 inches; yellowish brown (10YR 5/6) clay loam; weak fine prismatic structure parting to moderate medium subangular blocky; friable; common fine roots; thin continuous brown (10YR 5/3) clay films on faces of peds; few black (10YR 2/1) accumulations of iron and manganese oxide; about 1 percent pebbles less than 0.25 inch in diameter; very strongly acid; gradual smooth boundary.

Bt3—30 to 42 inches; dark yellowish brown (10YR 4/4) clay loam; weak fine prismatic structure parting to moderate medium subangular blocky; firm; thin continuous brown (10YR 5/3) clay films on faces of peds; common black (10YR 2/1) accumulations of iron and manganese oxide; about 1 percent pebbles less than 0.25 inch in diameter; very strongly acid; gradual smooth boundary.

Bt4—42 to 52 inches; dark yellowish brown (10YR 4/4) clay loam; common fine faint brown (10YR 5/3) mottles; weak fine prismatic structure parting to moderate fine subangular blocky; friable; thin continuous brown (10YR 5/3) clay films on faces of peds; common black (10YR 2/1) accumulations of iron and manganese oxide; about 1 percent pebbles less than 0.25 inch in diameter; very strongly acid; gradual smooth boundary.

BC—52 to 60 inches; dark yellowish brown (10YR 4/4) clay loam; many fine faint brown (10YR 5/3) mottles; weak fine prismatic structure parting to weak fine subangular blocky; friable; common black (10YR 2/1) accumulations of iron and manganese oxide; about 1 percent pebbles less than 0.25 inch in diameter; strongly acid; gradual smooth boundary.

C—60 to 70 inches; yellowish brown (10YR 5/4) clay loam; many fine distinct brown (10YR 5/3) mottles; massive; friable; strongly acid.

The solum is 50 to 80 inches thick. The Ap horizon has chroma of 1 to 3. It is silt loam or loam and is neutral to strongly acid. The content of gravel in this horizon is 0 to 3 percent. The Bt and C horizons have value of 4 or 5 and chroma of 4 to 6. The Bt horizon is very strongly acid or strongly acid. The C horizon is very strongly acid to medium acid. It is clay loam or sandy clay loam. The content of gravel in this horizon is 0 to 3 percent.

Steff Series

The Steff series consists of deep, moderately well drained, moderately permeable soils on bottom land. These soils formed in silty alluvium. Slopes range from 0 to 2 percent.

Steff soils are commonly near Bonnie and Stendal soils. The nearby soils are grayer than the Steff soils. They are in the lower landscape positions.

Typical pedon of Steff silt loam, frequently flooded, in an idle field; 1,970 feet west and 1,950 feet south of the northeast corner of sec. 25, T. 1 S., R. 12 W.

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; moderate medium angular blocky structure; friable; many fine roots; medium acid; clear smooth boundary.

Bw1—9 to 23 inches; dark yellowish brown (10YR 4/4) silt loam; few medium distinct light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable; many fine roots; very strongly acid; gradual smooth boundary.

Bw2—23 to 41 inches; dark yellowish brown (10YR 4/4) silt loam; many fine distinct light brownish gray (10YR 6/2) mottles; weak fine prismatic structure parting to weak fine subangular blocky; friable; many fine roots; very strongly acid; gradual smooth boundary.

Cg—41 to 60 inches; light brownish gray (10YR 6/2) silt loam; many coarse distinct dark yellowish brown (10YR 4/4) mottles; massive; friable; few coarse roots; very strongly acid.

The solum is 24 to 50 inches thick. The Ap horizon has value of 4 or 5 and chroma of 2 or 3. The Bw and C horizons are strongly acid or very strongly acid. The Bw horizon has value of 4 or 5 and chroma of 3 or 4. It has mottles with chroma of 2 within 20 inches of the surface. The part of the C horizon within a depth of 40 inches has colors similar to those of the Bw horizon. The part below a depth of 40 inches has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 2 to 4.

Stendal Series

The Stendal series consists of deep, somewhat poorly drained, moderately permeable soils on bottom land. These soils formed in silty alluvium. Slopes range from 0 to 2 percent.

Stendal soils are commonly near Birds, Bonnie, and Steff soils. Birds and Bonnie soils are dominantly grayish throughout the subsoil. They are in the lower landscape positions. Steff soils have a dominantly brownish subsoil. They are in the slightly higher landscape positions.

Typical pedon of Stendal silt loam, frequently flooded, in a cultivated field; 1,895 feet east and 1,260 feet north of the southwest corner of sec. 21, T. 3 S., R. 9 W.

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 roots; neutral; abrupt smooth boundary.

Bw—10 to 18 inches; dark yellowish brown (10YR 4/4) silt loam; many fine distinct light brownish gray (10YR 6/2) mottles; moderate fine subangular blocky structure; friable; common fine roots; strongly acid; gradual smooth boundary.
Bg—18 to 37 inches; light gray (10YR 7/2) silt loam; common fine distinct yellowish brown (10YR 5/4) mottles; weak fine subangular blocky structure; friable; common fine roots; strongly acid; gradual smooth boundary.
Cg—37 to 60 inches; light brownish gray (10YR 6/2) silt loam; many medium distinct dark yellowish brown (10YR 4/4) mottles; massive; friable; strongly acid.

The A horizon has value of 4 or 5 and chroma of 2 or 3. The Bw horizon has value of 4 or 5 and chroma of 3 or 4 and has mottles with chroma of 2 or less. It is very strongly acid to neutral. The Bg and Cg horizons have hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. They are very strongly acid or strongly acid.

Swanwick Variant

The Swanwick Variant consists of deep, well drained, moderately slowly permeable soils in upland areas that have been surface mined. These soils formed in the material in reclaimed areas. Slopes range from 1 to 15 percent.

Swanwick Variant soils are commonly near Hosmer and Gudgel soils. The nearby soils have a fragipan and do not have coarse fragments in the solum. They are in undisturbed areas.

Typical pedon of Swanwick Variant silt loam, 1 to 15 percent slopes, in an area of hayland; 1,400 feet north and 1,150 feet east of the southwest corner of sec. 11, T. 3 S., R. 9 W.

Ap—0 to 6 inches; yellowish brown (10YR 5/6) silt loam, very pale brown (10YR 7/4) dry; weak medium subangular blocky structure; friable; many fine roots; neutral; gradual smooth boundary.
C1—6 to 34 inches; yellowish brown (10YR 5/6) stratified silt loam and silty clay loam; common medium distinct light gray (10YR 7/2) mottles; dominantly relict blocky structure of various sizes and grades; firm; many fine roots; thin discontinuous brown (10YR 5/3) clay films on faces of peds; common black (10YR 2/1) concretions of iron and manganese oxide; about 5 percent sandstone and shale fragments less than 0.5 inch in diameter; neutral; abrupt smooth boundary.
2C2—34 to 60 inches; dark gray (N 4/0) extremely shaly silt loam; massive; firm; about 85 percent shale fragments dominantly less than 3 inches in size but ranging to 6 inches; slight effervescence; moderately alkaline.

The depth to extremely shaly material ranges from 24 to 40 inches. The Ap horizon has value of 4 to 6 and chroma of 2 to 6. It is silt loam or silty clay loam. The content of sandstone and shale fragments in this horizon is 0 to 5 percent.

The C1 horizon is mixed remnants of the original silty soils. Parts of relict horizons are randomly distributed, mixed, and reoriented throughout. Individual peds may have characteristics of a previous formation. In some pedons this horizon is very firm and compacted. It has value of 4 to 6 and chroma of 2 to 6. It is silt loam or silty clay loam. In some pedons it is stratified. It is medium acid to neutral. The content of sandstone and shale fragments ranges from 0 to 10 percent.

The 2C2 horizon is graded cast overburden and is dominantly shale fragments and lesser amounts of sandstone fragments. The fragments are less than 0.25 inch to more than 2 inches in diameter. The content of silt and clay is less than 20 percent. This horizon is neutral to moderately alkaline and is commonly calcareous.

Sylvan Series

The Sylvan series consists of deep, well drained, moderately permeable soils in the uplands. These soils formed in loess. Slopes range from 2 to 50 percent.

Sylvan soils are similar to Alford and Uniontown soils and are commonly near Alford, Bloomfield, and Parke soils. The nearby soils are in landscape positions similar to those of the Sylvan soils. Alford and Parke soils have a solum that is thicker than that of the Sylvan soils. Bloomfield soils are sandy throughout. Uniontown soils have a subsoil that is more yellowish than that of the Sylvan soils. They are on lacustrine terraces.

Typical pedon of Sylvan silt loam, 18 to 50 percent slopes, in an area of woodland; 1,400 feet west and 1,320 feet north of the southeast corner of sec. 12, T. 1 S., R. 11 W.

A—0 to 3 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; mixed with some very dark grayish brown (10YR 3/2) material; moderate fine subangular blocky structure; friable; many fine roots; neutral; clear smooth boundary.
BE—3 to 7 inches; yellowish brown (10YR 5/6) silt loam; moderate fine subangular blocky structure; friable; common fine roots; few faint brown (10YR 5/3) organic coatings on faces of peds; slightly acid; gradual smooth boundary.
Bt—7 to 22 inches; strong brown (7.5YR 5/6) silt loam; moderate medium subangular blocky structure; friable; few fine roots; thin discontinuous brown (7.5YR 5/4) clay films on faces of peds; medium acid; gradual smooth boundary.
C—22 to 60 inches; light brownish gray (10YR 6/2) silt loam; many fine distinct light yellowish brown (10YR

6/4) mottles; massive; friable; few strong brown (7.5YR 5/8) iron and manganese oxide stains; slight effervescence; moderately alkaline.

The solum is 17 to 35 inches thick. It is neutral to medium acid. The depth to carbonates is generally the same as the thickness of the solum.

The A horizon has value of 3 or 4 and chroma of 2 or 3. Pedons in cultivated areas have an Ap horizon, which has value of 4 or 5 and chroma of 2 or 3. Some pedons have a thin E horizon. This horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. The C horizon has chroma of 2 or 3. It is silt loam or silt and is neutral to moderately alkaline.

Taftown Series

The Taftown series consists of deep, well drained, moderately permeable soils on side slopes in the uplands. These soils formed in loess and in the underlying sandstone and shale residuum. Slopes range from 12 to 25 percent.

Taftown soils are commonly near Alford, Gilpin Variant, Gudgel, Hosmer, and Parke soils. Alford and Parke soils do not have residuum or bedrock within a depth of 80 inches. They are in the higher landscape positions. Gilpin Variant soils have bedrock at a depth of 20 to 40 inches. They are in landscape positions similar to those of the Taftown soils. Hosmer and Gudgel soils have a fragipan. They are in the higher landscape positions.

Typical pedon of Taftown silt loam, 18 to 25 percent slopes, in an area of hardwoods; 150 feet west and 100 feet south of the center of sec. 5, T. 2 S., R. 10 W.

A—0 to 4 inches; dark brown (10YR 3/3) silt loam, brown (10YR 5/3) dry; weak fine subangular blocky structure parting to weak very fine granular; friable; many fine roots; slightly acid; clear smooth boundary.

E—4 to 9 inches; yellowish brown (10YR 5/4) silt loam; weak very fine subangular blocky structure parting to weak fine granular; friable; many fine roots; thin discontinuous dark gray (10YR 4/1) organic coatings on faces of peds; slightly acid; clear smooth boundary.

Bt1—9 to 17 inches; yellowish brown (10YR 5/6) silt loam; weak fine subangular blocky structure; friable; many fine roots; thin discontinuous yellowish brown (10YR 5/4) clay films on faces of peds; very strongly acid; gradual smooth boundary.

Bt2—17 to 29 inches; yellowish brown (10YR 5/6) silt loam; moderate medium angular and subangular blocky structure; friable; common fine roots; thin discontinuous strong brown (7.5YR 5/6) clay films on faces of peds; very strongly acid; gradual smooth boundary.

2Bt3—29 to 38 inches; yellowish brown (10YR 5/4) loam; moderate medium angular and subangular blocky structure; firm; few fine roots; thin continuous yellowish brown (10YR 5/4) and strong brown (7.5YR 5/6) clay films on faces of peds; about 14 percent soft sandstone fragments less than 1 inch in diameter; very strongly acid; gradual smooth boundary.

2Bt4—38 to 49 inches; strong brown (7.5YR 5/6) silt loam; moderate medium angular and subangular blocky structure; firm; few fine roots; thin patchy yellowish brown (10YR 5/4) and strong brown (7.5YR 5/6) clay films on faces of peds; common black (10YR 2/1) iron and manganese oxide stains; about 5 percent soft sandstone fragments less than 1 inch in diameter; strongly acid; gradual smooth boundary.

2Bt5—49 to 64 inches; strong brown (7.5YR 5/6) silt loam; weak coarse subangular blocky structure; firm; few fine roots; thin discontinuous light gray (10YR 7/2) clay films on faces of peds; common black (10YR 2/1) iron and manganese oxide stains; about 2 percent soft sandstone fragments less than 0.5 inch in diameter; medium acid; abrupt smooth boundary.

2Cr—64 inches; soft, neutral, interbedded sandstone and shale.

The thickness of the solum and the depth to bedrock range from 40 to 72 inches. The depth to residuum ranges from 24 to 40 inches.

The A and E horizons are strongly acid to slightly acid. The A horizon has value of 3 to 5 and chroma of 2 or 3. The E horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. The Bt and 2Bt horizons have hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. They are medium acid to very strongly acid. The 2Cr horizon is dominantly neutral but ranges to moderately alkaline. Some strata in this horizon are calcareous.

Uniontown Series

The Uniontown series consists of deep, well drained and moderately well drained soils on lacustrine terraces. These soils formed in silty sediments. Permeability is moderate in the upper part of the profile and moderate or moderately slow in the underlying material. Slopes range from 0 to 12 percent.

Uniontown soils are similar to Alford and Sylvan soils and are commonly near Evansville, Ragsdale, and Reesville soils. Alford and Sylvan soils are on uplands. Alford soils have a solum that is thicker than that of the Uniontown soils, and Sylvan soils have a slightly redder subsoil. Evansville, Ragsdale, and Reesville soils have grayish colors in the subsoil. They are in the lower depressional areas.

Typical pedon of Uniontown silt loam, 2 to 6 percent slopes, eroded, in a cultivated field; 1,525 feet north and 150 feet west of the southeast corner of donation 45, T. 1 S., R. 10 W.

Ap—0 to 9 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; mixed with some yellowish brown (10YR 5/6) subsoil material; weak very fine subangular blocky structure; friable; few fine roots; slightly acid; abrupt smooth boundary.

Bt1—9 to 15 inches; yellowish brown (10YR 5/6) silty clay loam; moderate medium subangular blocky structure; friable; few fine roots; thin continuous yellowish brown (10YR 5/4) clay films on faces of peds; few fine black (10YR 2/1) accumulations of iron and manganese oxide; neutral; gradual smooth boundary.

Bt2—15 to 20 inches; yellowish brown (10YR 5/6) silt loam; moderate medium subangular blocky structure; friable; few fine roots; thin continuous yellowish brown (10YR 5/4) clay films on faces of peds; few fine black (10YR 2/1) accumulations of iron and manganese oxide; neutral; gradual smooth boundary.

Bt3—20 to 25 inches; yellowish brown (10YR 5/6) silty clay loam; moderate fine subangular blocky structure; friable; few fine roots; thin discontinuous yellowish brown (10YR 5/4) clay films on faces of peds; few fine black (10YR 2/1) accumulations of iron and manganese oxide; neutral; gradual smooth boundary.

Bt4—25 to 31 inches; yellowish brown (10YR 5/6) silt loam; moderate fine subangular blocky structure; friable; few fine roots; thin discontinuous yellowish brown (10YR 5/4) clay films on faces of peds; few fine black (10YR 2/1) accumulations of iron and manganese oxide; mildly alkaline; gradual smooth boundary.

Bt5—31 to 39 inches; yellowish brown (10YR 5/6) silt loam; weak fine subangular blocky structure; friable; few fine roots; thin patchy yellowish brown (10YR 5/4) clay films on faces of peds; few fine black (10YR 2/1) accumulations of iron and manganese oxide; common fine dark yellowish brown (10YR 4/4) iron oxide stains; slight effervescence; moderately alkaline; clear smooth boundary.

C—39 to 60 inches; yellowish brown (10YR 5/6) silt loam; many medium distinct light brownish gray (10YR 6/2) mottles; massive; friable; few fine roots; few fine black (10YR 2/1) accumulations of iron and manganese oxide; slight effervescence; moderately alkaline.

The solum is 30 to 42 inches thick. The depth to free carbonates is 30 to 50 inches.

The Ap horizon has value of 4 or 5 and chroma of 2 to 4. Pedons in uncultivated areas have a thin A horizon, which has value of 3 and chroma of 2 or 3. The Bt horizon has value of 4 or 5 and chroma of 4 to 6. It is silt loam or silty clay loam. It ranges from medium acid to moderately alkaline. Some pedons have mottles with chroma of 2 below the upper 10 inches of this horizon. The C horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2 to 8.

Vincennes Series

The Vincennes series consists of deep, poorly drained, slowly permeable soils on low river terraces and on bottom land. These soils formed in loamy sediments. Slopes range from 0 to 2 percent.

Vincennes soils are commonly near Crawleyville, Elkinsville, Rensselaer, Skelton, and Zipp soils. Crawleyville soils are dominantly brownish in the upper part of the subsoil. They are in the slightly higher landscape positions. Elkinsville and Skelton soils do not have grayish colors in the subsoil. They are in the higher landscape positions. Rensselaer and Zipp soils are in positions similar to those of the Vincennes soils. Rensselaer soils have a dark surface layer. Zipp soils have more clay than the Vincennes soils.

Typical pedon of Vincennes loam, in a cultivated field; 410 feet south and 90 feet west of the center of sec. 11, T. 2 S., R. I2 W.

Ap—0 to 10 inches; dark grayish brown (10YR 4/2) loam, light brownish gray (10YR 6/2) dry; weak fine subangular blocky structure; friable; common fine roots; about 2 percent gravel; neutral; abrupt smooth boundary.

E—10 to 15 inches; light brownish gray (10YR 6/2) loam; many medium prominent brown (7.5YR 4/4) mottles; weak medium platy structure parting to moderate fine subangular blocky; friable; few fine roots; about 2 percent gravel; slightly acid; gradual smooth boundary.

Btg1—15 to 24 inches; light gray (10YR 7/2) clay loam; common medium prominent brown (7.5YR 4/4) mottles; moderate medium subangular blocky structure parting to moderate fine subangular blocky; friable; few fine roots; thin discontinuous light brownish gray (10YR 6/2) clay films on faces of peds; about 2 percent gravel; medium acid; gradual smooth boundary.

Btg2—24 to 36 inches; light brownish gray (10YR 6/2) clay loam; many coarse and medium distinct yellowish brown (10YR 5/6) mottles; weak fine prismatic structure parting to moderate fine subangular blocky; firm; thin discontinuous light gray (10YR 6/1) clay films on faces of peds; about 2 percent gravel; medium acid; gradual smooth boundary.

Btg3—36 to 49 inches; light gray (10YR 6/1) clay loam; many fine prominent strong brown (7.5YR 5/6) mottles; weak fine prismatic structure parting to

moderate fine subangular blocky; firm; thin discontinuous light gray (10YR 6/1) clay films on faces peds; about 2 percent gravel; strongly acid; gradual smooth boundary.

Cg—49 to 60 inches; gray (10YR 5/1) clay loam; common fine distinct dark yellowish brown (10YR 4/4) mottles; massive; firm; many black (10YR 2/1) accumulations of iron and manganese oxide; about 2 percent gravel; strongly acid.

The solum is 40 to 65 inches thick. The content of gravel ranges from 0 to 10 percent throughout the profile.

The A and E horizons are silt loam or loam. The A horizon has value of 4 or 5 and chroma of 1 or 2. It ranges from strongly acid to neutral. The E horizon has value of 5 or 6 and chroma of 1 or 2. It is strongly acid to slightly acid. The Btg horizon has hue of 10YR or 2.5Y and value of 4 to 7. It ranges from very strongly acid to slightly acid. The Cg horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. It is dominantly clay loam or loam. In some pedons, however, it has strata of sandy clay loam or sandy loam. It ranges from strongly acid to neutral.

Wakeland Series

The Wakeland series consists of deep, somewhat poorly drained, moderately permeable soils on bottom land. These soils formed in silty alluvium. Slopes range from 0 to 2 percent.

Wakeland soils are similar to Maplehill soils and are commonly near Birds, Haymond, and Wilbur soils. Maplehill soils have a buried solum within a depth of 36 inches. Birds soils are dominantly grayish throughout the subsoil. They are in the slightly lower landscape positions. Haymond and Wilbur soils are dominantly brownish throughout the subsoil. They are in the slightly higher landscape positions.

Typical pedon of Wakeland silt loam, frequently flooded, in a cultivated field; 2,300 feet west and 290 feet south of the northeast corner of sec. 26, T. 1 N., R. 10 W.

Ap—0 to 6 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak very fine subangular blocky structure; friable; few fine roots; neutral; gradual smooth boundary.

C—6 to 15 inches; brown (10YR 4/3) silt loam; common fine distinct light brownish gray (10YR 6/2) mottles; weak fine subangular blocky structure; friable; neutral; gradual smooth boundary.

Cg1—15 to 33 inches; grayish brown (10YR 5/2) silt loam; few fine distinct dark yellowish brown (10YR 4/4) mottles; massive; friable; many fine prominent strong brown (7.5YR 5/6) accumulations of iron and manganese oxide; neutral; gradual smooth boundary.

Cg2—33 to 43 inches; grayish brown (10YR 5/2) silt loam; many fine prominent brown (7.5YR 4/4) mottles; massive; friable; neutral; gradual smooth boundary.

Cg3—43 to 65 inches; light brownish gray (10YR 6/2) silt loam; many medium distinct yellowish brown (10YR 5/6) mottles; massive; friable; neutral.

The soils are medium acid to neutral to a depth of 60 inches. The Ap horizon has value of 4 or 5 and chroma of 2 or 3. The C horizon has value of 4 or 5 and chroma of 3 or 4. The Cg horizon has value of 5 or 6 and chroma of 1 or 2.

Wilbur Series

The Wilbur series consists of deep, moderately well drained, moderately permeable soils on bottom land. These soils formed in silty alluvium. Slopes range from 0 to 2 percent.

Wilbur soils are commonly near Birds, Haymond, and Wakeland soils. Birds and Wakeland soils have a dominantly grayish subsoil. They are in the lower landscape positions. Haymond soils do not have grayish colors in the upper 40 inches. They are in the slightly higher landscape positions.

Typical pedon of Wilbur silt loam, frequently flooded, in a cultivated field; 2,140 feet north and 1,320 feet east of the southwest corner of donation 99, T. 1 S., R. 10 W.

Ap—0 to 7 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; moderate medium granular structure; friable; few fine roots; neutral; clear smooth boundary.

Bw—7 to 17 inches; dark yellowish brown (10YR 4/4) silt loam; few fine faint grayish brown (10YR 5/3) mottles; weak fine subangular blocky structure; friable; few fine roots; neutral; gradual smooth boundary.

C—17 to 32 inches; brown (10YR 5/3) silt loam; few fine faint grayish brown (10YR 5/2) mottles; massive; friable; neutral; clear smooth boundary.

Cg—32 to 60 inches; light brownish gray (10YR 6/2) silt loam; many fine prominent brown (7.5YR 4/4) mottles; massive; friable; common dark yellowish brown (10YR 4/4) iron stains; neutral.

The soils are neutral to medium acid to a depth of 60 inches. The Ap horizon has value of 4 or 5 and chroma of 2 to 4. The Bw horizon has value of 4 or 5 and chroma of 3 or 4. The part of the C horizon within a depth of 30 inches has value of 4 or 5 and chroma of 3 to 5. The part below a depth of 30 inches has value of 4 to 6 and chroma of 2 to 6. Some pedons have thin strata of loam or fine sandy loam.

Wilhite Series

The Wilhite series consists of deep, very poorly drained, very slowly permeable soils on bottom land. These soils formed in silty and clayey alluvium. Slopes range from 0 to 2 percent.

Wilhite soils are commonly near Lindside, Newark, and Nolin soils. Lindside and Nolin soils have a dominantly brownish subsoil. They are in the higher landscape positions. Newark soils are brownish in the upper part of the subsoil. They are in the slightly higher landscape positions.

Typical pedon of Wilhite silty clay, frequently flooded, in an area of woodland; 1,975 feet east and 150 feet north of the southwest corner of sec. 22, T. 1 S., R. 12 W.

A—0 to 8 inches; dark grayish brown (10YR 4/2) silty clay, light brownish gray (10YR 6/2) dry; weak fine subangular blocky structure; friable; many very fine roots; strongly acid; gradual smooth boundary.

Bg1—8 to 16 inches; gray (10YR 5/1) silty clay; few fine distinct dark yellowish brown (10YR 4/4) mottles; mixed with dark grayish brown (10YR 4/2) material from the A horizon; weak fine subangular blocky structure; friable; many fine roots; medium acid; clear smooth boundary.

Bg2—16 to 36 inches; light gray (10YR 6/1) silty clay; common fine prominent dark yellowish brown (10YR 4/4) mottles; weak fine prismatic structure; firm; common fine roots; slightly acid; clear smooth boundary.

Cg—36 to 60 inches; light gray (10YR 6/1) silty clay loam; many medium prominent yellowish red (5YR 5/8) mottles; massive; firm; medium acid.

The solum is 30 to 50 inches thick. The soils are silty clay or silty clay loam throughout.

The A horizon has value of 4 or 5 and chroma of 1 or 2. It is strongly acid or medium acid. The Bg and Cg horizons are strongly acid to slightly acid. The Bg horizon has value of 4 to 6. The Cg horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2.

Wirt Series

The Wirt series consists of deep, well drained soils on bottom land. These soils formed in silty, loamy, and sandy alluvium. Permeability is moderate in the upper part of the profile and moderately rapid or rapid in the underlying material. Slopes range from 0 to 2 percent.

Wirt soils are commonly near Chagrin, Moundhaven, and Nolin soils. The nearby soils are in landscape positions similar to those of the Wirt soils. Chagrin soils have a solum that is thicker than that of the Wirt soils. Moundhaven soils have more sand in the control section than the Wirt soils and are calcareous. Nolin soils have less sand than the Wirt soils.

Typical pedon of Wirt silt loam, sandy substratum, frequently flooded, in a cultivated field; 120 feet west and 150 feet south of the northeast corner of sec. 28, T. 1 S., R. 12 W.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam, light gray (10YR 6/1) dry; weak fine subangular blocky structure; friable; few fine roots; few faint dark gray (10YR 4/1) organic coatings on faces of peds; slightly acid; clear smooth boundary.

Bw1—8 to 16 inches; dark yellowish brown (10YR 4/4) silt loam; weak medium prismatic structure parting to weak fine subangular blocky; friable; few fine roots; few distinct dark grayish brown (10YR 4/2) organic coatings on faces of peds; neutral; gradual smooth boundary.

Bw2—16 to 24 inches; dark yellowish brown (10YR 4/4) sandy loam; weak fine subangular blocky structure; friable; few fine roots; few distinct dark grayish brown (10YR 4/2) organic coatings on faces of peds; neutral; gradual smooth boundary.

C—24 to 60 inches; stratified yellowish brown (10YR 5/6) sand and dark yellowish brown (10YR 4/4) loamy sand; single grain; loose; neutral.

The solum is 15 to 27 inches thick. It is medium acid to neutral. The content of clay in the control section ranges from 10 to 18 percent.

The Ap horizon has value of 3 to 5 and chroma of 2 to 4. It is silt loam or loam. The Bw and C horizons have value of 3 to 5 and chroma of 3 to 6. The Bw horizon is silt loam, loam, or sandy loam. The C horizon is dominantly sand but in many pedons is stratified with loamy sand or loamy fine sand.

Zipp Series

The Zipp series consists of deep, very poorly drained, slowly permeable soils on river terraces and lake plains. These soils formed in dominantly fine textured outwash and lacustrine sediments. Slopes range from 0 to 2 percent.

Zipp soils are commonly near Vincennes soils. The nearby soils have less clay than the Zipp soils and are more acid. They are in landscape positions similar to those of the Zipp soils.

Typical pedon of Zipp silty clay, in a cultivated field; 2,730 feet north and 125 feet west of the southeast corner of sec. 23, T. 2 S., R. 12 W.

Ap—0 to 9 inches; dark gray (10YR 4/1) silty clay, light brownish gray (10YR 6/2) dry; weak medium subangular blocky structure; firm; common fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; neutral; clear smooth boundary.

Bg1—9 to 24 inches; gray (10YR 5/1) clay; common fine prominent strong brown (7.5YR 5/6) mottles; weak fine prismatic structure parting to moderate medium subangular blocky; firm; few fine roots; neutral; gradual smooth boundary.

Bg2—24 to 46 inches; gray (10YR 5/1) clay; common fine distinct dark yellowish brown (10YR 4/4) mottles; weak medium prismatic structure parting to moderate fine angular and subangular blocky; firm; few fine roots; neutral; gradual smooth boundary.

Cg—46 to 60 inches; light gray (10YR 6/1) clay; common fine distinct yellowish brown (10YR 5/6) mottles; massive; firm; mildly alkaline.

The solum is 30 to 48 inches thick. It is neutral to medium acid. The content of clay in the control section ranges from 40 to 55 percent.

The Ap horizon has chroma of 1 or 2. It is silty clay loam or silty clay. The Bg horizon has hue of 10YR or 2.5Y and value of 4 to 6. It is silty clay or clay. The Cg horizon has colors and textures similar to those of the Bg horizon. It is neutral to moderately alkaline.

Formation of the Soils

This section relates the major factors of soil formation to the soils in the county. It also describes the processes of soil formation.

Factors of Soil Formation

Soils form through the processes that act on deposited or accumulated geologic material. The characteristics of the soil at any given point are determined by the physical and mineralogical composition of the parent material; the climate under which the soil accumulated and has existed since accumulation; the plant and animal life on and in the soil; the relief, or lay of the land; and the length of time that the forces of soil formation have acted on the soil material.

Climate and plant and animal life, chiefly plants, are active factors of soil formation. They act on the parent material that has accumulated through the weathering of rocks and slowly change it into a natural body that has genetically related horizons. The effects of climate and plant and animal life are conditioned by relief. The parent material affects the kind of soil profile that forms and, in extreme cases, determines it almost entirely. Finally, time is needed for the transformation of the parent material into a soil that has genetically related horizons. Some time is always required for the differentiation of horizons.

The factors of soil formation are so closely interrelated in their effects on the soil that few generalizations can be made regarding the effects of any one factor unless conditions are specified for the other four.

Parent Material

Parent material is the unconsolidated mass in which a soil forms. It determines the chemical and mineralogical composition of the soils. The parent materials of most of the soils in the county are of glacial origin or are bedrock residuum. The glacial materials were reworked and redeposited by the subsequent actions of wind and water. The properties of these materials vary greatly, sometimes within small areas, depending on how the materials were deposited. The dominant parent materials in the county are loess, sandy windblown material, lacustrine deposits, glacial outwash, residuum, and alluvium.

Loess is silty material that was blown from bottom land and dry lakebeds and deposited on the adjacent uplands by strong winds during late Wisconsinan time. This material covers almost all of the uplands in the county. The thickness of the loess ranges from about 30 feet on nearly level ridgetops to less than 3 feet on the steeper side slopes. Unweathered loess is calcareous and friable and is made up mainly of silt particles. Alford and Sylvan are examples of soils that formed in loess. These soils generally are medium textured and have well developed structure.

Sandy windblown material was carried from bottom land and deposited as dunes in the uplands adjacent to the valleys of the Wabash and White Rivers. This material apparently was deposited during late Wisconsinan time. It was deposited in isolated areas that range from less than an acre to more than several thousand acres in size. It ranges from less than 1 foot to more than 15 feet in thickness. Alvin and Bloomfield are examples of soils that formed in this material.

Lacustrine material was deposited from still water in large lakes formed during late Wisconsinan time. As the glaciers retreated, lakes formed in stream valleys that had been blocked by glacial drift. These temporary glacial lakes collected silt and clay particles carried by the slowly moving water. As the water drained from the lakes, the material that had collected in the lakebed was exposed to soil-forming processes. Ragsdale and Evansville are examples of soils that formed in lacustrine deposits.

Glacial outwash was deposited by running water from melting glaciers. The size of the particles that make up outwash varies, depending on the speed of the water that carried the material. When the water slowed down, the coarser particles were deposited. Finer particles, such as very fine sand, silt, and clay, were carried by the more slowly moving water and tend to be farther from the stream channels. Outwash deposits generally occur as layers of similar-size particles, such as silt, sand, or gravel. In Gibson County these deposits are on side slopes along the major drainageways in the uplands. Most have been covered by a blanket of loess. Parke and other soils formed in both the loess and the outwash.

Residuum is material weathered from local bedrock. The nature of the bedrock determines the chemical and mineralogical limits of the soil. Generally, a long time is

necessary for soils to form in bedrock residuum because this material does not break down easily. In Gibson County the bedrock is sedimentary rock of Pennsylvanian age. It consists of interbedded sandstone, siltstone, and shale. It is exposed on the steeper side slopes along the more deeply entrenched drainageways. Gilpin Variant soils are an example of soils that formed in material weathered from Pennsylvanian bedrock.

Alluvium is material that has been washed from upland areas and deposited by floodwater on the flood plains along streams and drainageways. This material varies in texture, depending on the nature of its source and the speed of the water from which it was deposited. Alluvium derived from areas that are dominantly loess tends to be silty, whereas alluvium derived from areas of glacial till has more sand. Since alluvial material has been deposited for a relatively short time, soils that formed in alluvium have properties that are similar to those of the original parent material. Moundhaven and Wakeland soils are examples.

Climate

Climate helps to determine the kind of plant and animal life on and in the soil and the amount of water available for the weathering of minerals and the translocation of soil material. Through its influence on soil temperature, climate determines the rate of the chemical reactions that occur in the soil.

The climate in Gibson County is generally temperate and humid. It is presumably similar to the climate under which the soils formed. Although the climate is uniform throughout the county, its effect is modified locally by runoff and other factors. Only minor differences among the soils are the result of differences in climate. More detailed information about the climate is available under the heading "General Nature of the County."

Plant and Animal Life

Plants have been the principal organisms influencing the soils in Gibson County. Bacteria, fungi, and earthworms, however, also have been important. The chief contribution of plant and animal life to soil formation is the addition of organic matter and nitrogen to the soil. The kind of organic matter in and on the soil depends on the kinds of native plants that grew on the soil. The remains of these plants accumulated on the surface, decayed, and became humus. The roots of the plants provided channels for the downward movement of water through the soil and added organic matter as they decayed. Bacteria in the soil helped to break down the organic matter into plant nutrients.

The native vegetation in Gibson County was mainly deciduous trees. The soils on uplands and high terraces mainly supported sugar maple, beech, oak, hickory, and yellow-poplar. The soils on bottom land and low terraces mainly supported red maple, ash, sycamore, cottonwood, and pin oak. The organic matter that accumulated in the forested soils was derived mainly from fallen leaves. After the leaves fell on the surface, they quickly decomposed and their nutrients were recycled. Soils that formed under forest vegetation are low to moderate in organic matter content and have a thin, light colored or moderately dark colored surface layer.

In some areas swamp grasses and sedges grew in shallow lakebeds that were covered with water much of the year. The organic matter from these plants decayed and accumulated slowly. Most of the soils that formed in these areas are high in organic matter content and have a thick, dark surface layer.

Relief

Relief has markedly affected the soils in the county through its effect on natural drainage, erosion, runoff, plant cover, and soil temperature. In Gibson County slopes range from 0 to more than 50 percent. Runoff is most rapid on the steeper slopes. Water is ponded in the lower areas.

Natural drainage in the county ranges from somewhat excessively drained on sandy ridgetops to very poorly drained in depressions on lake plains. Through its effect on aeration of the soil, drainage determines the color of the soil. Water and air move freely through well drained soils but slowly through very poorly drained or poorly drained soils. In Alford and other well drained, well aerated soils, the iron compounds that give most soils their color are oxidized and are reddish or brownish. Ragsdale and other very poorly drained, poorly aerated soils are generally gray because of the removal or reduction of iron compounds.

Time

Time, usually a long time, is required for the processes of soil formation to form distinct soil horizons. Differences in the length of time that the parent material has been in place are commonly reflected in the degree of profile development. Some soils form rapidly. Others form slowly.

The soils in the county range from young to mature. The loess deposits in which many of the soils formed have been exposed to the soil-forming processes long enough for the development of distinct horizons. Alford soils are an example of mature soils. They have been in place long enough for soil-forming processes to transform the original parent material. The horizons in these soils are distinct. The parent material in its original form is not evident within a depth of 5 feet.

Some soils have not been in place long enough for the development of distinct horizons. Wilbur and other young soils that formed in recently deposited alluvium are examples. These soils have a surface layer and a thin, weakly expressed subsoil. The material below the surface layer has few distinct subhorizons, and its

physical and chemical properties are almost the same as those of the original parent material.

Processes of Soil Formation

Several processes have been involved in the formation of the soils in Gibson County. These processes are the accumulation of organic matter; the dissolution, transfer, and removal of calcium carbonates and bases; the liberation and translocation of silicate clay minerals; and the reduction and transfer of iron. In most soils more than one of these processes have helped to differentiate horizons.

Some organic matter has accumulated in the surface layer of all the soils in the county. Because most of the native plants were trees, the organic matter content of the uneroded soils is generally moderate.

Carbonates and bases have been leached from the upper horizons of nearly all the soils in the county. Only a few young soils that formed in alluvial material derived from calcareous glacial till have carbonates in the upper part. Leaching probably preceded the translocation of silicate clay minerals. It is indicated by the absence of carbonates and by an acid reaction. Leaching of wet soils is slow because of a high water table and the slow movement of water through the profile.

Clay-size particles form through the weathering of larger particles. Water moves the clay particles downward through the profile. These particles accumulate in pores and on the faces of the structural units along which water moves. As a result, most soils have a higher content of clay in the subsoil than in the surface layer. Uniontown soils are an example of soils in which translocated silicate clays in the form of clay films have accumulated in the Bt horizon.

Gleying, or the reduction and transfer of iron, has occurred in all of the somewhat poorly drained to very poorly drained soils in the county. In the naturally wet soils, this process has significantly affected horizon differentation. A gray color in the subsoil indicates the reduction of iron oxide. Reduction is commonly accompanied by some transfer of the iron, either from upper horizons to lower ones or completely out of the profile. Mottles, which are in some horizons, indicate the segregation of iron.

References

(1) American Association of State Highway and Transportation Officials. 1982. Standard specifications for highway materials and methods of sampling and testing. Ed. 13, 2 vols., illus.

(2) American Society for Testing and Materials. 1985. Standard test method for classification of soils for engineering purposes. ASTM Stand. D 2487.

(3) Bazzell-Philips and Associates. 1975. Comprehensive plan—phase 1 for Gibson County, Indiana. 146 pp.

(4) Bushnell, T.M., and W.E. Tharp. 1926. Soil survey of Gibson County, Indiana. U.S. Dep. Agric., Bur. of Soils, 58 pp., illus.

(5) Folck, Virginia. (n.d.) Princeton—from tomahawks to trenches. 52 pp., illus.

(6) Indiana State Planning Service Agency. 1979. Indiana fact book, 1979. 137 pp.

(7) Princeton Clarion News. October 1936. Gibson County. Vol. 140, No. 220, newspaper article, pg. 3, illus.

(8) Stormont, Gil R. 1914. History of Gibson County, Indiana. 1,076 pp., illus.

(9) Tartt, J.T. 1884. History of Gibson County, Indiana. 226 pp., illus.

(10) United States Department of Agriculture. 1951. Soil survey manual. U.S. Dep. Agric. Handb. 18, 503 pp., illus.

(11) United States Department of Agriculture. 1975. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. Soil Conserv. Serv., U.S. Dep. Agric. Handb. 436, 754 pp., illus.

(12) United States Department of Agriculture, Soil Conservation Service. Resource data, facts, and trends of SWCD in Area 5. 25 pp. (Distributed by the Area Office of the Soil Conservation Service in October 1981)

(13) United States Department of Agriculture, Soil Conservation Service. National resource inventory—Gibson County. 4 pp. (Data distributed in 1982; available in the local office of the Soil Conservation Service at Princeton, Indiana)

(14) United States Department of Commerce, Bureau of the Census. 1983. 1982 census of agriculture—preliminary report, Gibson County, Indiana. AC82-A-18-051, 4 pp., illus.

Glossary

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as—

	Inches
Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation-exchange capacity.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bench terrace. A raised, level or nearly level strip of earth constructed on or nearly on the contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Bottom land. The normal flood plain of a stream, subject to flooding.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

California bearing ratio (CBR). The load-supporting capacity of a soil as compared to that of a 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.

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.

Channery soil. A soil that is, by volume, more than 15 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches along the longest axis. A single piece is called a channer.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

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 vegetation. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15 to 38 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.5 to 25 centimeters) in diameter.

Colluvium. Soil material, rock fragments, or both moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—
Loose.—Noncoherent when dry or moist; does not hold together in a mass.
Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.
Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.
Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.
Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.
Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.
Soft.—When dry, breaks into powder or individual grains under very slight pressure.
Cemented.—Hard; little affected by moistening.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:
Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.
Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.
Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.
Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.
Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods

during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay in the soil. The soil is not a source of gravel or sand for construction purposes.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grains are grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Fine textured soil. Sandy clay, silty clay, and clay.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Foot slope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant not a grass or a sedge.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Glacial drift (geology). Pulverized and other rock material transported by glacial ice and then deposited. Also the sorted and unsorted material deposited by streams flowing from glaciers.

Glacial outwash (geology). Gravel, sand, and silt, commonly stratified, deposited by glacial meltwater.

Glacial till (geology). Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Glaciofluvial deposits (geology). Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.

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 and mottles.

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 up to 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water (geology). Water filling all the unblocked pores of underlying 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.

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.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. The major horizons are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, any plowed or disturbed surface layer.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an O, A, or E horizon. The B horizon is in part a layer of transition from the overlying horizon to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) granular, prismatic, or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Hard, consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon but can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration 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

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are—
Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.
Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.
Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.
Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.
Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.
Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.
Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.
Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.
Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Lacustrine deposit (geology). Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

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.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low strength. The soil is not strong enough to support loads.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, and fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, and silty clay loam.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent.* The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Muck. Dark colored, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Munsell notation. A designation of color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it is generally low in relief.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan.*

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affecting the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

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. For example, slope, stoniness, and thickness.

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 closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Range site. An area of rangeland where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. A range 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 range sites in kind or proportion of species or total production.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered, or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rippable. Bedrock or hardpan can be excavated using a single-tooth ripping attachment mounted on a tractor with a 200-300 draw bar horsepower rating.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Root zone. The part of the soil that can be penetrated by plant roots.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-size 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.

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.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Sodicity. The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of Na^+ to $Ca^{++} + Mg^{++}$. The degrees of sodicity are—

	SAR
Slight	less than 13:1
Moderate	13-30:1
Strong	more than 30:1

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows:

	Millimeters
Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter.

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 which provide vegetative barriers to soil blowing and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil

from soil blowing and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Breaking up a compact subsoil by pulling a special chisel through the soil.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summer fallow. The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from about 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil. The A, E, AB, and EB horizons. It includes all subdivisions of these horizons.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material too thin for the specified use.

Till plain. An extensive flat to undulating area underlain by glacial till.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, are in soils in extremely small amounts. They are essential to plant growth.

Underlying material. The part of the soil below the solum.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Valley fill. In glaciated regions, material deposited in stream valleys by glacial meltwater. In nonglaciated regions, alluvium deposited by heavily loaded streams.

Variant, soil. A soil having properties sufficiently different from those of other known soils to justify a new series name, but occurring in such a limited geographic area that creation of a new series is not justified.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

(Recorded in the period 1951-78 at Princeton, Indiana)

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January-----	39.6	22.0	30.8	67	-8	61	2.86	1.30	4.18	6	3.0
February----	45.2	25.9	35.5	70	-1	92	2.68	1.28	3.89	5	2.9
March-------	54.4	33.9	44.2	79	11	240	4.56	2.35	6.48	8	1.5
April-------	67.9	45.0	56.5	85	25	495	4.44	2.32	6.29	8	.2
May---------	76.9	54.0	65.5	92	33	791	4.78	2.97	6.40	8	.0
June--------	85.8	62.7	74.2	98	45	1,026	4.23	2.09	6.08	7	.0
July--------	88.5	66.1	77.3	97	49	1,156	3.92	2.04	5.55	6	.0
August------	87.1	63.7	75.4	97	48	1,097	3.17	1.40	4.68	5	.0
September---	81.8	57.1	69.4	95	37	882	3.11	1.20	4.71	5	.0
October-----	70.7	45.6	58.2	89	26	564	2.67	1.16	3.95	5	.0
November----	55.3	35.8	45.6	78	12	196	3.44	1.61	5.00	6	.8
December----	43.4	26.9	35.1	68	-2	81	3.76	1.78	5.46	7	.7
Yearly:											
Average---	66.4	44.9	55.6	---	---	---	---	---	---	---	---
Extreme---	---	---	---	99	-12	---	---	---	---	---	---
Total-----	---	---	---	---	---	6,681	43.62	37.47	49.54	76	9.1

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40 degrees F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

(Recorded in the period 1951-78 at Princeton, Indiana)

Probability	Temperature		
	24° F or lower	28° F or lower	32° F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	Apr. 5	Apr. 20	Apr. 30
2 years in 10 later than--	Apr. 1	Apr. 14	Apr. 26
5 years in 10 later than--	Mar. 24	Apr. 4	Apr. 16
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 26	Oct. 19	Oct. 5
2 years in 10 earlier than--	Oct. 31	Oct. 23	Oct. 10
5 years in 10 earlier than--	Nov. 10	Nov. 1	Oct. 21

TABLE 3.--GROWING SEASON

(Recorded in the period 1951-78 at Princeton, Indiana)

Probability	Daily minimum temperature during growing season		
	Higher than 24° F	Higher than 28° F	Higher than 32° F
	Days	Days	Days
9 years in 10	213	189	165
8 years in 10	219	197	172
5 years in 10	230	211	186
2 years in 10	242	224	200
1 year in 10	248	232	208

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
Ad	Adrian-Rensselaer complex, drained	265	0.1
AlA	Alford silt loam, 0 to 2 percent slopes	1,339	0.4
AlB2	Alford silt loam, 2 to 6 percent slopes, eroded	19,536	6.1
AlB3	Alford silt loam, 2 to 6 percent slopes, severely eroded	1,022	0.3
AlC2	Alford silt loam, 6 to 12 percent slopes, eroded	2,879	0.9
AlC3	Alford silt loam, 6 to 12 percent slopes, severely eroded	13,594	4.3
AlD2	Alford silt loam, 12 to 18 percent slopes, eroded	1,097	0.3
AlD3	Alford silt loam, 12 to 18 percent slopes, severely eroded	4,202	1.3
AlE	Alford silt loam, 18 to 25 percent slopes	1,040	0.3
AmF	Alford-Parke silt loams, 18 to 50 percent slopes	877	0.3
AnB	Alvin fine sandy loam, 2 to 6 percent slopes	2,359	0.7
AnC2	Alvin fine sandy loam, 6 to 12 percent slopes, eroded	757	0.2
AnC3	Alvin fine sandy loam, 6 to 12 percent slopes, severely eroded	1,024	0.3
AnD2	Alvin fine sandy loam, 12 to 18 percent slopes, eroded	274	0.1
AnD3	Alvin fine sandy loam, 12 to 18 percent slopes, severely eroded	405	0.1
Ao	Aquents, frequently flooded	221	0.1
Ar	Armiesburg silt loam, occasionally flooded	637	0.2
As	Armiesburg silt loam, protected	934	0.3
Ay	Ayrshire Variant fine sandy loam	1,049	0.3
Bd	Birds silt loam, frequently flooded	6,922	2.2
BlA	Bloomfield sand, 0 to 2 percent slopes	1,155	0.4
BlB	Bloomfield sand, 2 to 6 percent slopes	5,126	1.6
BlC	Bloomfield sand, 6 to 12 percent slopes	3,567	1.1
BlD	Bloomfield sand, 12 to 18 percent slopes	653	0.2
BlF	Bloomfield sand, 18 to 50 percent slopes	1,034	0.3
Bo	Bonnie silt loam, frequently flooded	5,364	1.7
Bp	Bonnie silt loam, ponded	799	0.2
Cg	Chagrin silt loam, frequently flooded	1,481	0.5
Cr	Crawleyville loam	1,595	0.5
Du	Dumps, mine	70	*
EkA	Elkinsville silt loam, 0 to 2 percent slopes	901	0.3
EkB	Elkinsville silt loam, 2 to 6 percent slopes	294	0.1
Ev	Evansville silt loam	4,426	1.4
FaG	Fairpoint shaly silt loam, 15 to 60 percent slopes	702	0.2
GnF	Gilpin Variant silt loam, 18 to 50 percent slopes	1,612	0.5
GuC3	Gudgel silt loam, 6 to 12 percent slopes, severely eroded	1,914	0.6
GuD3	Gudgel silt loam, 12 to 18 percent slopes, severely eroded	2,425	0.8
Hd	Haymond silt loam, frequently flooded	1,479	0.5
HhA	Henshaw Variant silt loam, 0 to 2 percent slopes, frequently flooded	1,451	0.5
HoB2	Hosmer silt loam, 2 to 6 percent slopes, eroded	23,988	7.5
HoB3	Hosmer silt loam, 2 to 6 percent slopes, severely eroded	2,414	0.8
HoC	Hosmer silt loam, 6 to 12 percent slopes	842	0.3
HoC3	Hosmer silt loam, 6 to 12 percent slopes, severely eroded	17,238	5.4
IvA	Iva silt loam, 0 to 2 percent slopes	2,931	0.9
IvB	Iva silt loam, 2 to 4 percent slopes	1,039	0.3
Ju	Junius Variant loamy sand	890	0.3
La	Landes sandy loam, occasionally flooded	312	0.1
Ln	Lindside silt loam, frequently flooded	958	0.3
Ly	Lyles fine sandy loam	980	0.3
Lz	Lyles sandy loam, loamy substratum	2,902	0.9
Ma	Maplehill silt loam, frequently flooded	2,360	0.7
Md	Medway loam, occasionally flooded	612	0.2
Me	Medway loam, protected	396	0.1
Mg	Montgomery silty clay loam	1,087	0.3
Mh	Moundhaven fine sandy loam, frequently flooded	1,482	0.5
MuA	Muren silt loam, 0 to 2 percent slopes	1,232	0.4
MuB2	Muren silt loam, 2 to 6 percent slopes, eroded	4,591	1.4
Nk	Newark silty clay loam, frequently flooded	2,114	0.7
Nn	Nolin silt loam, protected	1,402	0.4
No	Nolin silt loam, frequently flooded	9,490	3.0
Pn	Patton silty clay loam	1,197	0.4
Po	Peoga silt loam	3,880	1.2

See footnote at end of table.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
Pp	Petrolia silt loam, frequently flooded	4,481	1.4
Pv	Petrolia silty clay loam, frequently flooded, very long duration	2,663	0.8
Pw	Pits, sand	210	0.1
Ra	Ragsdale silt loam	11,777	3.7
Rb	Ragsdale silt loam, overwash	5,011	1.6
RlA	Reesville silt loam, 0 to 2 percent slopes	7,362	2.3
Rr	Rensselaer fine sandy loam, loamy substratum	1,828	0.6
SbA	Skelton loam, 0 to 2 percent slopes	1,280	0.4
ScA	Skelton silt loam, 0 to 2 percent slopes, frequently flooded	500	0.2
Sf	Steff silt loam, frequently flooded	1,932	0.6
Sr	Stendal silt loam, frequently flooded	12,460	3.9
SvC	Swanwick Variant silt loam, 1 to 15 percent slopes	624	0.2
SyB2	Sylvan silt loam, 2 to 6 percent slopes, eroded	1,910	0.6
SyC3	Sylvan silt loam, 6 to 12 percent slopes, severely eroded	4,215	1.3
SyD	Sylvan silt loam, 12 to 18 percent slopes	328	0.1
SyF	Sylvan silt loam, 18 to 50 percent slopes	3,840	1.2
TaD3	Taftown silt loam, 12 to 18 percent slopes, severely eroded	810	0.3
TaE	Taftown silt loam, 18 to 25 percent slopes	1,545	0.5
Ud	Udorthents, cut and filled	1,402	0.4
UmD3	Udorthents-Sylvan complex, 12 to 18 percent slopes, severely eroded	1,131	0.4
UnA	Uniontown silt loam, 0 to 2 percent slopes	6,104	1.9
UnB2	Uniontown silt loam, 2 to 6 percent slopes, eroded	12,384	3.9
UnB3	Uniontown silt loam, 2 to 6 percent slopes, severely eroded	2,072	0.6
UnC3	Uniontown silt loam, 6 to 12 percent slopes, severely eroded	557	0.2
Vn	Vincennes loam	16,421	5.1
Vo	Vincennes silt loam, frequently flooded	6,468	2.0
Wa	Wakeland silt loam, frequently flooded	10,692	3.3
Wk	Wilbur silt loam, frequently flooded	2,905	0.9
Wo	Wilhite silty clay, frequently flooded	2,090	0.7
Wr	Wirt silt loam, sandy substratum, frequently flooded	506	0.2
Zp	Zipp silty clay	7,091	2.2
	Water areas more than 40 acres in size	3,953	1.2
	Water areas less than 40 acres in size	2,086	0.6
	Total	319,456	100.0

* Less than 0.1 percent.

TABLE 5.--PRIME FARMLAND

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland. If a soil is prime farmland only under certain conditions, the conditions are specified in parentheses after the soil name)

Map symbol	Soil name
AlA	Alford silt loam, 0 to 2 percent slopes
AlB2	Alford silt loam, 2 to 6 percent slopes, eroded
AnB	Alvin fine sandy loam, 2 to 6 percent slopes
Ar	Armiesburg silt loam, occasionally flooded
As	Armiesburg silt loam, protected
Ay	Ayrshire Variant fine sandy loam (where drained)
Bd	Birds silt loam, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
Bo	Bonnie silt loam, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
Cg	Chagrin silt loam, frequently flooded (where protected from flooding or not frequently flooded during the growing season)
Cr	Crawleyville loam (where drained)
EkA	Elkinsville silt loam, 0 to 2 percent slopes
EkB	Elkinsville silt loam, 2 to 6 percent slopes
Ev	Evansville silt loam (where drained)
Hd	Haymond silt loam, frequently flooded (where protected from flooding or not frequently flooded during the growing season)
HhA	Henshaw Variant silt loam, 0 to 2 percent slopes, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
HoB2	Hosmer silt loam, 2 to 6 percent slopes, eroded
IvA	Iva silt loam, 0 to 2 percent slopes (where drained)
IvB	Iva silt loam, 2 to 4 percent slopes (where drained)
La	Landes sandy loam, occasionally flooded
Ln	Lindside silt loam, frequently flooded (where protected from flooding or not frequently flooded during the growing season)
Ly	Lyles fine sandy loam (where drained)
Lz	Lyles sandy loam, loamy substratum (where drained)
Ma	Maplehill silt loam, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
Md	Medway loam, occasionally flooded
Me	Medway loam, protected
Mg	Montgomery silty clay loam (where drained)
MuA	Muren silt loam, 0 to 2 percent slopes
MuB2	Muren silt loam, 2 to 6 percent slopes, eroded
Nk	Newark silty clay loam, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
Nn	Nolin silt loam, protected
No	Nolin silt loam, frequently flooded (where protected from flooding or not frequently flooded during the growing season)
Pn	Patton silty clay loam (where drained)
Po	Peoga silt loam (where drained)
Pp	Petrolia silt loam, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
Ra	Ragsdale silt loam (where drained)
Rb	Ragsdale silt loam, overwash (where drained)
RlA	Reesville silt loam, 0 to 2 percent slopes (where drained)
Rr	Rensselaer fine sandy loam, loamy substratum (where drained)
SbA	Skelton loam, 0 to 2 percent slopes
ScA	Skelton silt loam, 0 to 2 percent slopes, frequently flooded (where protected from flooding or not frequently flooded during the growing season)
Sf	Steff silt loam, frequently flooded (where protected from flooding or not frequently flooded during the growing season)
Sr	Stendal silt loam, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
SyB2	Sylvan silt loam, 2 to 6 percent slopes, eroded
UnA	Uniontown silt loam, 0 to 2 percent slopes
UnB2	Uniontown silt loam, 2 to 6 percent slopes, eroded
Vn	Vincennes loam (where drained)

TABLE 5.--PRIME FARMLAND--Continued

Map symbol	Soil name
Vo	Vincennes silt loam, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
Wa	Wakeland silt loam, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
Wk	Wilbur silt loam, frequently flooded (where protected from flooding or not frequently flooded during the growing season)
Wo	Wilhite silty clay, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
Wr	Wirt silt loam, sandy substratum, frequently flooded (where protected from flooding or not frequently flooded during the growing season)
Zp	Zipp silty clay (where drained)

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE

(Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Orchardgrass-alfalfa hay*	Tall fescue
		Bu	Bu	Bu	Tons	AUM**
Ad Adrian-Rensselaer	IVw	135	48	54	4.5	9.0
AlA Alford	I	125	44	50	4.1	8.2
AlB2 Alford	IIe	120	42	48	4.0	8.0
AlB3 Alford	IIIe	115	40	46	3.8	7.6
AlC2 Alford	IIIe	110	38	44	3.6	7.2
AlC3 Alford	IVe	105	37	42	3.5	7.0
AlD2 Alford	IVe	95	33	38	3.1	6.2
AlD3 Alford	VIe	---	---	36	3.0	6.0
AlE Alford	VIe	---	---	---	2.8	5.6
AmF Alford-Parke	VIIe	---	---	---	2.0	4.0
AnB Alvin	IIe	90	33	41	3.0	6.0
AnC2 Alvin	IIIe	80	30	36	2.6	5.2
AnC3 Alvin	IVe	75	25	35	2.5	5.0
AnD2 Alvin	IVe	65	23	29	2.2	4.4
AnD3 Alvin	VIe	---	---	27	2.0	4.0
Ao. Aquents						
Ar Armiesburg	IIw	135	47	54	4.5	9.0
As Armiesburg	I	125	44	54	4.1	8.2
Ay Ayrshire Variant	IIw	85	30	38	2.8	5.6

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Orchardgrass-alfalfa hay*	Tall fescue
		Bu	Bu	Bu	Tons	AUM**
Bd---------- Birds	IIIw	135	47	54	4.5	9.0
BlA, BlB---------- Bloomfield	IIIs	65	23	29	2.2	4.4
BlC---------- Bloomfield	IIIe	55	19	25	1.8	3.6
BlD---------- Bloomfield	IVe	40	14	18	1.3	2.6
BlF---------- Bloomfield	VIe	---	---	---	1.0	2.0
Bo---------- Bonnie	IIIw	125	44	50	4.1	8.2
Bp---------- Bonnie	VIIIw	---	---	---	0.2	0.4
Cg---------- Chagrin	IIw	120	42	48	4.0	8.0
Cr---------- Crawleyville	IIw	115	40	46	3.8	7.6
Du***. Dumps						
EkA---------- Elkinsville	I	120	42	48	4.0	8.0
EkB---------- Elkinsville	IIe	120	42	48	4.0	8.0
Ev---------- Evansville	IIw	145	51	58	4.8	9.6
FaG---------- Fairpoint	VIIe	---	---	---	0.2	0.4
GnF---------- Gilpin Variant	VIIe	---	---	---	1.0	2.0
GuC3---------- Gudgel	IVe	65	24	29	2.2	4.4
GuD3---------- Gudgel	VIe	---	---	23	1.7	3.4
Hd---------- Haymond	IIw	125	44	50	4.1	8.2
HhA---------- Henshaw Variant	IIw	135	47	54	4.5	9.0
HoB2---------- Hosmer	IIe	95	33	43	3.1	6.2

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Orchardgrass-alfalfa hay*	Tall fescue
		Bu	Bu	Bu	Tons	AUM**
HoB3---------- Hosmer	IIIe	85	30	38	2.8	5.6
HoC---------- Hosmer	IIIe	95	33	43	3.1	6.2
HoC3---------- Hosmer	IVe	75	26	34	2.5	5.0
IvA---------- Iva	IIw	135	47	54	4.5	9.0
IvB---------- Iva	IIe	135	47	54	4.5	9.0
Ju---------- Junius Variant	IIw	120	42	48	4.0	8.0
La---------- Landes	IIw	100	35	45	3.3	6.6
Ln---------- Lindside	IIw	130	46	52	4.3	8.6
Ly---------- Lyles	IIw	120	42	54	4.0	8.0
Lz---------- Lyles	IIw	125	44	56	4.1	8.2
Ma---------- Maplehill	IIw	135	47	54	4.5	9.0
Md---------- Medway	IIw	130	46	52	4.3	8.6
Me---------- Medway	I	130	46	52	4.3	8.6
Mg---------- Montgomery	IIIw	120	42	48	4.0	8.0
Mh---------- Moundhaven	IIIw	80	28	36	2.6	5.2
MuA---------- Muren	I	125	44	50	4.1	8.2
MuB2---------- Muren	IIe	120	42	48	4.0	8.0
Nk---------- Newark	IIw	135	47	54	4.5	9.0
Nn---------- Nolin	I	125	45	50	4.1	8.2
No---------- Nolin	IIIw	125	44	50	4.1	8.2

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Orchardgrass-alfalfa hay*	Tall fescue
		Bu	Bu	Bu	Tons	AUM**
Pn---------- Patton	IIw	155	54	62	5.1	10.2
Po---------- Peoga	IIIw	125	44	50	4.1	8.2
Pp---------- Petrolia	IIIw	135	47	54	4.5	9.0
Pv---------- Petrolia	Vw	---	---	---	0.2	0.4
Pw***. Pits						
Ra---------- Ragsdale	IIw	155	54	62	5.1	10.2
Rb---------- Ragsdale	IIw	150	53	60	5.0	10.0
RlA---------- Reesville	IIw	135	47	54	4.5	9.0
Rr---------- Rensselaer	IIw	145	51	58	4.8	9.6
SbA---------- Skelton	I	110	40	44	3.6	7.2
ScA---------- Skelton	IIw	110	40	44	3.6	7.2
Sf---------- Steff	IIw	120	42	48	4.0	8.0
Sr---------- Stendal	IIw	130	46	52	4.3	8.6
SvC---------- Swanwick Variant	IIIs	85	30	34	2.8	5.6
SyB2---------- Sylvan	IIe	120	42	48	4.0	8.0
SyC3, SyD---------- Sylvan	IVe	100	35	40	3.3	6.6
SyF---------- Sylvan	VIIe	---	---	---	2.1	4.2
TaD3---------- Taftown	VIe	---	---	32	2.6	5.2
TaE---------- Taftown	VIe	---	---	---	2.5	5.0
Ud. Udorthents						

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Orchardgrass-alfalfa hay*	Tall fescue
		Bu	Bu	Bu	Tons	AUM**
UmD3---------- Udorthents-Sylvan	VIe	---	---	36	3.0	6.0
UnA---------- Uniontown	I	120	42	48	4.0	8.0
UnB2---------- Uniontown	IIe	115	40	46	3.8	7.6
UnB3---------- Uniontown	IIIe	110	39	44	3.6	7.2
UnC3---------- Uniontown	IVe	100	35	40	3.3	6.6
Vn---------- Vincennes	IIw	130	46	52	4.3	8.6
Vo---------- Vincennes	IIw	130	46	52	4.3	8.6
Wa---------- Wakeland	IIw	135	47	54	4.5	9.0
Wk---------- Wilbur	IIw	125	44	50	4.1	8.2
Wo---------- Wilhite	IVw	115	40	46	3.8	7.6
Wr---------- Wirt	IIw	85	30	34	2.8	5.6
Zp---------- Zipp	IIIw	105	37	42	3.5	7.0

* The Birds, Bonnie, Evansville, Junius Variant, Lyles, Montgomery, Patton, Peoga, Petrolia, Ragsdale, Reesville, Rensselaer, Vincennes, Wilhite, and Zipp soils are suitable for alfalfa only if they are drained.

** Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

*** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 7.--CAPABILITY CLASSES AND SUBCLASSES

(Miscellaneous areas are excluded. Absence of an entry indicates no acreage)

Class	Total acreage	Major management concerns (Subclass)			
		Erosion (e)	Wetness (w)	Soil problem (s)	Climate (c)
		Acres	Acres	Acres	Acres
I	13,588	---	---	---	---
II	171,337	66,101	105,236	---	---
III	60,255	13,553	39,797	6,905	---
IV	43,249	40,894	2,355	---	---
V	2,663	---	2,663	---	---
VI	12,592	12,592	---	---	---
VII	7,031	7,031	---	---	---
VIII	799	---	799	---	---

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY

(Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available)

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Volume*	
Ad**:									
Adrian	2W	Slight	Severe	Severe	Severe	White ash	51	35	
						Red maple	51	33	
						Quaking aspen	56	56	
						Black willow	---	---	
						Silver maple	76	30	
Rensselaer	5W	Slight	Severe	Severe	Severe	Pin oak	86	68	Eastern white pine, baldcypress, sweetgum, red maple, white ash.
						White oak	75	57	
						Sweetgum	90	106	
						Northern red oak	76	58	
A1A, A1B2, A1B3, A1C2, A1C3, A1D2, A1D3----- Alford	5A	Slight	Slight	Slight	Slight	White oak	90	72	Eastern white pine, red pine, black walnut, yellow-poplar, white ash, black locust.
						Yellow-poplar	98	104	
						Sweetgum	76	70	
A1E---------- Alford	5R	Moderate	Moderate	Slight	Slight	White oak	90	72	Eastern white pine, red pine, black walnut, yellow-poplar, white ash, black locust.
						Yellow-poplar	98	104	
						Sweetgum	76	70	
AmF**:									
Alford	5R	Moderate	Moderate	Slight	Slight	White oak	90	72	Eastern white pine, red pine, black walnut, yellow-poplar, white ash, black locust.
						Yellow-poplar	98	104	
						Sweetgum	76	70	
Parke	5R	Moderate	Moderate	Slight	Slight	White oak	90	72	Eastern white pine, red pine, black walnut, yellow-poplar, white ash, black locust, northern red oak, green ash, black cherry, American sycamore, eastern cottonwood.
						Yellow-poplar	98	104	
						Sweetgum	76	70	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Volume*	
AnB, AnC2, AnC3-- Alvin	4A	Slight	Slight	Slight	Slight	White oak Northern red oak Black walnut Yellow-poplar	80 80 --- 90	62 62 --- 90	Green ash, black walnut, yellow-poplar, white oak, eastern white pine, American sycamore, sugar maple.
AnD2, AnD3------ Alvin	4R	Moderate	Moderate	Slight	Slight	White oak Northern red oak Black walnut Yellow-poplar	80 80 --- 90	62 62 --- 90	Green ash, black walnut, yellow-poplar, white oak, eastern white pine, American sycamore, sugar maple.
Ar, As---------- Armiesburg	8A	Slight	Slight	Slight	Slight	Yellow-poplar White oak Black walnut	100 90 70	107 72 ---	Eastern white pine, black walnut, yellow-poplar, black locust.
Ay---------- Ayrshire Variant	5A	Slight	Slight	Slight	Slight	White oak Yellow-poplar Pin oak	85 100 100	67 107 82	White oak, cherrybark oak, pin oak, green ash, white ash, American sycamore, eastern cottonwood, black locust.
Bd---------- Birds	5W	Slight	Severe	Moderate	Moderate	Pin oak Eastern cottonwood Sweetgum Cherrybark oak American sycamore	90 100 --- --- ---	72 128 --- --- ---	Eastern cottonwood, red maple, American sycamore, baldcypress, water tupelo.
BlA, BlB, BlC, BlD---------- Bloomfield	4S	Slight	Slight	Moderate	Slight	Black oak White oak Scarlet oak Shagbark hickory	70 --- --- ---	52 --- --- ---	Eastern white pine, Scotch pine, red pine, eastern redcedar, jack pine.
BlF---------- Bloomfield	4R	Moderate	Moderate	Moderate	Slight	Black oak White oak Scarlet oak Shagbark hickory	70 --- --- ---	52 --- --- ---	Eastern white pine, Scotch pine, red pine, eastern redcedar, jack pine.

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Volume*	
Bo---------- Bonnie	5W	Slight	Severe	Severe	Severe	Pin oak----------	90	72	Eastern cottonwood, red maple, American sycamore, sweetgum, baldcypress, pin oak.
						Eastern cottonwood--	100	128	
						Sweetgum----------	---	---	
						Cherrybark oak------	---	---	
						American sycamore---	---	---	
Cg---------- Chagrin	5A	Slight	Slight	Slight	Slight	Northern red oak----	86	68	Eastern white pine, black walnut, yellow-poplar, white ash, red pine, northern red oak, white oak.
						Yellow-poplar-------	96	100	
						Sugar maple---------	86	53	
						White oak-----------	---	---	
						Black cherry--------	---	---	
						White ash-----------	---	---	
						Black walnut--------	---	---	
Cr---------- Crawleyville	4A	Slight	Slight	Slight	Slight	White oak-----------	70	52	Eastern white pine, white ash, yellow-poplar, American sycamore, white oak, northern red oak, green ash, red pine, black cherry, eastern cottonwood.
						Pin oak----------	85	67	
						Yellow-poplar-------	85	81	
						Sweetgum----------	80	79	
						Northern red oak----	75	57	
EkA, EkB-------- Elkinsville	5A	Slight	Slight	Slight	Slight	White oak-----------	90	72	Eastern white pine, red pine, white ash, yellow-poplar, black walnut, black locust.
						Yellow-poplar-------	98	104	
						Sweetgum----------	76	70	
Ev---------- Evansville	5W	Slight	Severe	Moderate	Moderate	Pin oak----------	90	72	Eastern white pine, baldcypress, Norway spruce, red maple, white ash, sweetgum.
						White oak-----------	75	57	
						Sweetgum----------	90	106	
FaG---------- Fairpoint	1S	Severe	Severe	Severe	Slight		---	---	Eastern white pine, black locust, yellow-poplar, Scotch pine, Norway spruce, white spruce, blue spruce.

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Volume*	
GnF---------- Gilpin Variant	4R	Severe	Severe	Slight	Slight	Northern red oak----	80	62	Japanese larch, Virginia pine, eastern white pine, black cherry, yellow-poplar.
						Yellow-poplar-------	95	98	
GuC3, GuD3------ Gudgel	5D	Slight	Slight	Moderate	Moderate	Northern red oak----	85	67	Virginia pine, eastern white pine, northern red oak, white oak.
						Black oak----------	---	---	
						White oak----------	---	---	
						Hickory------------	---	---	
						Yellow-poplar-------	---	---	
Hd---------- Haymond	8A	Slight	Slight	Slight	Slight	Yellow-poplar-------	100	107	Eastern white pine, black walnut, yellow-poplar, black locust.
						White oak----------	90	72	
						Black walnut--------	70	---	
HhA---------- Henshaw Variant	5W	Slight	Moderate	Slight	Slight	Northern red oak----	85	67	Eastern white pine, white ash, eastern cottonwood, black cherry, red pine, northern red oak, white oak, yellow-poplar, green ash.
						Yellow-poplar-------	---	---	
						Sugar maple---------	---	---	
						White ash----------	---	---	
						White oak----------	---	---	
						Black walnut--------	---	---	
						Black cherry--------	---	---	
						Red maple----------	---	---	
HoB2, HoB3, HoC, HoC3---------- Hosmer	4A	Slight	Slight	Slight	Slight	White oak----------	75	57	Eastern white pine, shortleaf pine, red pine, yellow-poplar, white ash.
						Yellow-poplar-------	90	90	
						Virginia pine-------	75	115	
						Sugar maple---------	75	47	
IvA, IvB-------- Iva	4W	Slight	Moderate	Slight	Slight	White oak----------	75	57	Eastern white pine, baldcypress, white ash, red maple, yellow-poplar, American sycamore.
						Pin oak------------	85	67	
						Yellow-poplar-------	85	81	
						Sweetgum-----------	80	79	
Ju---------- Junius Variant	3W	Slight	Moderate	Moderate	Moderate	Red maple----------	70	43	Eastern white pine, northern white-cedar.
						Eastern white pine--	65	136	
						White ash----------	65	59	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Volume*	
La---------- Landes	7A	Slight	Slight	Slight	Slight	Yellow-poplar-------	95	98	Eastern cottonwood, yellow-poplar, American sycamore, sweetgum, green ash, black walnut, eastern white pine, sugar maple.
						Eastern cottonwood--	105	141	
						American sycamore---	---	---	
						Sweetgum-----------	---	---	
						Green ash----------	---	---	
Ln---------- Lindside	5A	Slight	Slight	Slight	Slight	Northern red oak----	86	68	Eastern white pine, yellow-poplar, Norway spruce, Japanese larch, black walnut, black oak, northern red oak, shortleaf pine, white ash, white oak, Virginia pine.
						Yellow-poplar-------	95	98	
						Black walnut--------	---	---	
						White ash----------	85	88	
						White oak----------	85	67	
						Red maple----------	---	---	
Ly---------- Lyles	5W	Slight	Severe	Severe	Severe	Pin oak------------	88	70	Eastern white pine, baldcypress, pin oak, red maple, American sycamore, sweetgum, green ash.
						White oak----------	75	57	
						Sweetgum-----------	90	106	
						Northern red oak----	76	58	
Lz---------- Lyles	5W	Slight	Severe	Severe	Severe	Pin oak------------	90	72	Pin oak, swamp white oak, green ash, red maple, silver maple, American sycamore, sweetgum, baldcypress.
						Sweetgum-----------	---	---	
						Red maple----------	---	---	
						Green ash----------	---	---	
Ma---------- Maplehill	4A	Slight	Slight	Slight	Slight	Northern red oak----	76	58	Eastern white pine, black cherry, white ash, yellow-poplar, red pine, white oak, northern red oak, green ash, eastern cottonwood, American sycamore.
						White oak----------	---	---	
						Black walnut--------	---	---	
						White ash----------	---	---	
						Sugar maple--------	---	---	
						Black cherry-------	---	---	
						Yellow-poplar-------	---	---	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Volume*	
Md, Me---------- Medway	5A	Slight	Slight	Slight	Slight	Northern red oak---- Yellow-poplar------- Sugar maple--------- White oak----------- Black walnut-------- Black cherry-------- White ash-----------	86 96 --- --- --- --- ---	68 100 --- --- --- --- ---	Eastern white pine, yellow-poplar, black walnut, white ash, red pine, northern red oak, white oak.
Mg---------- Montgomery	5W	Slight	Severe	Severe	Severe	Pin oak---------- White oak----------- Sweetgum-----------	88 75 90	70 57 106	American sycamore, pin oak, green ash, red maple, eastern cottonwood, silver maple.
Mh---------- Moundhaven	4S	Slight	Slight	Moderate	Severe	Northern red oak---- White oak----------- Yellow-poplar-------	78 --- ---	60 --- ---	Black walnut, black oak, yellow-poplar, red pine.
MuA, MuB2------- Muren	5A	Slight	Slight	Slight	Slight	White oak---------- Yellow-poplar------- Sweetgum-----------	90 98 76	72 104 70	Eastern white pine, red pine, black walnut, black locust, yellow-poplar, white ash.
Nk---------- Newark	4W	Slight	Moderate	Slight	Moderate	Pin oak---------- Eastern cottonwood-- Sweetgum---------- Green ash---------- Cherrybark oak------ Shumard oak--------- Overcup oak---------	96 89 85 --- --- --- ---	78 100 93 --- --- --- ---	Eastern cottonwood, sweetgum, American sycamore.
Nn---------- Nolin	8A	Slight	Moderate	Slight	Slight	Yellow-poplar------- Sweetgum---------- Cherrybark oak------ Eastern cottonwood-- Black walnut-------- American sycamore--- River birch---------	107 92 97 --- --- --- ---	119 112 79 --- --- --- ---	Yellow-poplar, eastern white pine, eastern cottonwood, white ash, cherrybark oak, sweetgum, black walnut.
No---------- Nolin	8W	Slight	Moderate	Moderate	Slight	Sweetgum---------- Cherrybark oak------ Eastern cottonwood-- River birch--------- Black willow-------- American sycamore---	92 97 --- --- --- ---	112 79 --- --- --- ---	Eastern cottonwood, green ash, cherrybark oak, sweetgum, pin oak.

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Volume*	
Pn---------- Patton	5W	Slight	Severe	Moderate	Moderate	Pin oak----------	85	67	Eastern white pine, baldcypress, Norway spruce, red maple, white ash, sweetgum.
						White oak----------	75	57	
						Sweetgum----------	80	79	
						Northern red oak----	75	57	
Po---------- Peoga	5W	Slight	Severe	Severe	Moderate	Pin oak----------	90	72	Eastern white pine, baldcypress, green ash, red maple, white ash, sweetgum, pin oak.
						White oak----------	75	57	
						Sweetgum----------	90	106	
Pp, Pv---------- Petrolia	5W	Slight	Moderate	Moderate	Slight	Pin oak----------	90	72	Eastern cottonwood, red maple, American sycamore, baldcypress, water tupelo.
						Eastern cottonwood--	100	128	
						Sweetgum----------	---	---	
						Cherrybark oak------	---	---	
						American sycamore---	---	---	
Ra, Rb---------- Ragsdale	5W	Slight	Severe	Severe	Severe	Pin oak----------	90	72	Eastern white pine, baldcypress, Norway spruce, red maple, white ash, sweetgum.
						White oak----------	75	57	
						Sweetgum----------	90	106	
RlA---------- Reesville	4W	Slight	Moderate	Slight	Slight	Northern red oak----	76	58	Red maple, silver maple, pin oak, sweetgum, red pine, swamp white oak, baldcypress, green ash, eastern cottonwood, American sycamore.
						Yellow-poplar-------	86	82	
						Sugar maple---------	90	55	
						Green ash----------	---	---	
						Swamp white oak-----	---	---	
						Black cherry--------	---	---	
						Red maple----------	---	---	
						Pin oak----------	---	---	
						Eastern cottonwood--	---	---	
Rr---------- Rensselaer	5W	Slight	Severe	Severe	Severe	Pin oak----------	85	67	Eastern white pine, baldcypress, Norway maple, red maple, white ash, sweetgum.
						White oak----------	75	57	
						Sweetgum----------	90	106	
						Northern red oak----	75	57	
SbA, ScA-------- Skelton	4A	Slight	Slight	Slight	Slight	Northern red oak----	80	62	Yellow-poplar, eastern white pine, American sycamore, white oak, white ash.
						Yellow-poplar-------	90	90	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Volume*	
Sf---------- Steff	8A	Slight	Slight	Slight	Slight	Yellow-poplar--------- River birch---------- Silver maple--------- American sycamore---- Black oak---------- White oak---------- Sweetgum---------- White ash---------- Red maple---------- Blackgum----------	107 --- --- --- 88 --- 100 --- --- ---	119 --- --- --- 70 --- 138 --- --- ---	Yellow-poplar, eastern white pine, sweetgum, black walnut, white oak, white ash, northern red oak, shortleaf pine.
Sr---------- Stendal	5W	Slight	Moderate	Slight	Slight	Pin oak---------- Sweetgum---------- Yellow-poplar--------- Virginia pine---------	90 85 90 90	72 93 90 135	Eastern white pine, baldcypress, American sycamore, red maple, white ash.
SvC---------- Swanwick Variant	---	---	---	---	---	---	---	---	Yellow-poplar, oak, Virginia pine, American sycamore, white oak, green ash.
SyB2, SyC3------ Sylvan	6A	Slight	Slight	Slight	Slight	Yellow-poplar--------- White oak---------- Northern red oak---- Black walnut---------	90 80 80 ---	90 62 62 ---	White oak, black walnut, northern red oak, green ash, eastern white pine, red pine, sugar maple.
SyD, SyF-------- Sylvan	6R	Moderate	Moderate	Moderate	Slight	Yellow-poplar--------- White oak---------- Northern red oak---- Black walnut---------	90 80 80 ---	90 62 62 ---	White oak, black walnut, northern red oak, green ash, eastern white pine, red pine, sugar maple.
TaD3, TaE------- Taftown	4R	Moderate	Moderate	Slight	Slight	Northern red oak---- Yellow-poplar--------- White oak---------- Black cherry--------- Sugar maple--------- White ash----------	71 90 --- --- --- ---	53 90 --- --- --- ---	White oak, yellow-poplar, northern red oak, white ash, green ash, black cherry, red pine, black cherry.
UmD3**: Udorthents.									

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Volume*	
UmD3**: Sylvan	6R	Moderate	Moderate	Moderate	Slight	Yellow-poplar White oak Northern red oak Black walnut	90 80 80 ---	90 62 62 ---	White oak, black walnut, northern red oak, green ash, eastern white pine, red pine, sugar maple.
UnA Uniontown	6A	Slight	Slight	Slight	Slight	Yellow-poplar Sweetgum Black walnut Cherrybark oak Hackberry Pin oak Red maple	89 80 --- --- --- --- ---	88 79 --- --- --- --- ---	Black walnut, yellow-poplar, white ash, eastern white pine, shortleaf pine, loblolly pine, cherrybark oak, sweetgum, eastern cottonwood.
UnB2 Uniontown	6A	Slight	Slight	Slight	Slight	Yellow-poplar Northern red oak Black oak Shumard oak Sweetgum Hickory White oak	89 83 82 83 79 --- ---	88 65 64 65 77 --- ---	Yellow-poplar, black walnut, white ash, white oak, northern red oak, eastern white pine, sweetgum.
UnB3, UnC3 Uniontown	4A	Slight	Slight	Slight	Slight	Northern red oak Black oak White oak Hickory Elm Red maple Sweetgum	70 70 65 --- --- --- ---	52 52 48 --- --- --- ---	White ash, eastern white pine, northern red oak, white oak.
Vn Vincennes	5W	Slight	Severe	Severe	Moderate	Pin oak White oak Sweetgum	86 75 90	68 57 106	American sycamore, baldcypress, green ash, red maple, pin oak, sweetgum, eastern cottonwood, silver maple, swamp white oak.

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Volume*	
Vo---------- Vincennes	5W	Slight	Severe	Severe	Moderate	Pin oak----------	86	68	American sycamore, baldcypress, green ash, red maple, pin oak, sweetgum, eastern cottonwood, silver maple, swamp white oak.
						White oak----------	75	57	
						Sweetgum----------	90	106	
						Red maple----------	---	---	
Wa---------- Wakeland	5A	Slight	Slight	Slight	Slight	Pin oak----------	90	72	Eastern white pine, baldcypress, American sycamore, red maple, white ash.
						Sweetgum----------	88	101	
						Yellow-poplar-------	90	90	
						Virginia pine-------	85	129	
Wk---------- Wilbur	8A	Slight	Slight	Slight	Slight	Yellow-poplar-------	100	107	Eastern white pine, black walnut, yellow-poplar, black locust.
Wo---------- Wilhite	5W	Slight	Severe	Severe	Severe	Pin oak----------	86	68	Eastern white pine, baldcypress, sweetgum, red maple, white ash.
						White oak----------	75	57	
						Sweetgum----------	90	106	
Wr---------- Wirt	4A	Slight	Slight	Slight	Slight	Northern red oak----	82	64	Black walnut, yellow-poplar, eastern white pine.
						Yellow-poplar-------	90	90	
						Sugar maple---------	---	---	
						Green ash----------	---	---	
						Black walnut--------	---	---	
						Boxelder-----------	---	---	
Zp---------- Zipp	5W	Slight	Severe	Severe	Severe	Pin oak----------	88	70	Eastern white pine, baldcypress, sweetgum, red maple, white ash.
						White oak----------	75	57	
						Sweetgum----------	90	106	

* Volume is the yield in cubic feet per acre per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS

(The symbol < means less than; > means more than. Absence of an entry indicates that trees generally do not grow to the given height on that soil)

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
Ad*: Adrian	Common ninebark	Amur honeysuckle, Amur privet, silky dogwood, nannyberry viburnum.	Tall purple willow	Black willow, golden willow.	Imperial Carolina poplar.
Rensselaer	---	Amur honeysuckle, silky dogwood, Amur privet, American cranberrybush.	Northern white-cedar, Norway spruce, Austrian pine, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
A1A, A1B2, A1B3, A1C2, A1C3, A1D2, A1D3, A1E Alford	---	Amur honeysuckle, American cranberrybush, Amur privet, silky dogwood.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
AmF*: Alford	---	Amur honeysuckle, American cranberrybush, Amur privet, silky dogwood.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
Parke	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, northern white-cedar, blue spruce, white fir.	Austrian pine, Norway spruce.	Pin oak, eastern white pine.
AnB, AnC2, AnC3, AnD2, AnD3 Alvin	---	Amur privet, Washington hawthorn, Amur honeysuckle, American cranberrybush.	Austrian pine, northern white-cedar, osageorange, eastern redcedar.	Eastern white pine, red pine, Norway spruce.	---
Ao. Aquents					

See footnote at end of table.

TABLE 9.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
Ar, As---------- Armiesburg	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak, imperial Carolina poplar.
Ay---------- Ayrshire Variant	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak, imperial Carolina poplar.
Bd---------- Birds	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Washington hawthorn, white fir, blue spruce, northern white-cedar, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.
BlA, BlB, BlC, BlD, BlF--------- Bloomfield	Siberian peashrub	Radiant crabapple, eastern redcedar, autumn-olive, Washington hawthorn, Amur honeysuckle, lilac.	Austrian pine, jack pine, red pine.	Eastern white pine	---
Bo---------- Bonnie	---	Silky dogwood, Amur honeysuckle, Amur privet, American cranberrybush.	White fir, blue spruce, Washington hawthorn, northern white-cedar, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.
Bp. Bonnie					
Cg---------- Chagrin	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak, imperial Carolina poplar.
Cr---------- Crawleyville	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak, imperial Carolina poplar.
Du*. Dumps					

See footnote at end of table.

TABLE 9.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
EkA, EkB---------- Elkinsville	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Pin oak, eastern white pine.
Ev---------- Evansville	---	Amur honeysuckle, Amur privet, American cranberrybush, silky dogwood.	Northern white-cedar, Norway spruce, Austrian pine, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak, imperial Carolina poplar.
FaG. Fairpoint					
GnF---------- Gilpin Variant	Siberian peashrub	Eastern redcedar, radiant crabapple, Washington hawthorn, autumn-olive, Amur honeysuckle, lilac.	Eastern white pine, Austrian pine, red pine, jack pine.	---	---
GuC3, GuD3-------- Gudgel	---	American cranberrybush, Amur honeysuckle, Amur privet, arrowwood, Washington hawthorn, eastern redcedar.	Hackberry, osageorange, Austrian pine.	Pin oak, eastern white pine.	---
Hd---------- Haymond	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak, imperial Carolina poplar.
HhA---------- Henshaw Variant	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak, imperial Carolina poplar.
HoB2, HoB3, HoC, HoC3---------- Hosmer	---	Eastern redcedar, arrowwood, Washington hawthorn, Amur privet, American cranberrybush, Amur honeysuckle.	Austrian pine, green ash, osageorange.	Eastern white pine, pin oak.	---

See footnote at end of table.

TABLE 9.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
IvA, IvB---------- Iva	---	Amur honeysuckle, American cranberrybush, Amur privet, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak, imperial Carolina poplar.
Ju---------- Junius Variant	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak, imperial Carolina poplar.
La---------- Landes	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak, imperial Carolina poplar.
Ln---------- Lindside	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, blue spruce, northern white-cedar, white fir, Austrian pine.	Norway spruce-----	Pin oak, eastern white pine, imperial Carolina poplar.
Ly---------- Lyles	---	Amur honeysuckle, silky dogwood, Amur privet, American cranberrybush.	Northern white-cedar, Norway spruce, Austrian pine, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak, imperial Carolina poplar.
Lz---------- Lyles	---	Silky dogwood, Amur privet, American cranberrybush, Amur honeysuckle.	Blue spruce, Washington hawthorn, northern white-cedar, Austrian pine, Norway spruce, white fir.	Eastern white pine	Pin oak, imperial Carolina poplar.
Ma---------- Maplehill	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak, imperial Carolina poplar.
Md, Me---------- Medway	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, imperial Carolina poplar.

See footnote at end of table.

TABLE 9.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
Mg---------- Montgomery	---	Silky dogwood, Amur honeysuckle, Amur privet, American cranberrybush.	Northern white-cedar, Norway spruce, Austrian pine, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
Mh---------- Moundhaven	---	Siberian peashrub	Green ash, Washington hawthorn, northern white-cedar, nannyberry viburnum, osageorange, white spruce, eastern redcedar.	---	---
MuA, MuB2--------- Muren	---	Amur honeysuckle, American cranberrybush, Amur privet, silky dogwood.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
Nk---------- Newark	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, blue spruce, northern white-cedar, white fir, Austrian pine, Norway spruce.	Eastern white pine	Pin oak, imperial Carolina poplar.
Nn, No---------- Nolin	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, blue spruce, northern white-cedar, white fir, Austrian pine.	Norway spruce-----	Pin oak, eastern white pine, imperial Carolina poplar.
Pn---------- Patton	---	Amur privet, silky dogwood, American cranberrybush, Amur honeysuckle.	White fir, northern white-cedar, blue spruce, Austrian pine, Washington hawthorn, Norway spruce.	Eastern white pine	Pin oak, imperial Carolina poplar.
Po---------- Peoga	---	Amur honeysuckle, silky dogwood, Amur privet, American cranberrybush.	Northern white-cedar, Norway spruce, Austrian pine, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.

See footnote at end of table.

TABLE 9.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
Pp, Pv---------- Petrolia	---	Silky dogwood, Amur privet, American cranberrybush, Amur honeysuckle.	White fir, blue spruce, Washington hawthorn, Norway spruce, Austrian pine, northern white-cedar.	Eastern white pine	Pin oak.
Pw*. Pits					
Ra, Rb---------- Ragsdale	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Norway spruce, Austrian pine, northern white-cedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak, imperial Carolina poplar.
RlA---------- Reesville	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak, imperial Carolina poplar.
Rr---------- Rensselaer	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Northern white-cedar, Washington hawthorn, blue spruce, Austrian pine, Norway spruce, white fir.	Eastern white pine	Pin oak, imperial Carolina poplar.
SbA, ScA---------- Skelton	---	Amur honeysuckle, American cranberrybush, Amur privet, silky dogwood.	Northern white-cedar, white fir, Washington hawthorn, blue spruce.	Austrian pine, Norway spruce.	Eastern white pine, pin oak, imperial Carolina poplar.
Sf---------- Steff	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, blue spruce, northern white-cedar, white fir, Austrian pine.	Norway spruce-----	Pin oak, eastern white pine, imperial Carolina poplar.
Sr---------- Stendal	---	Amur honeysuckle, silky dogwood, Amur privet, American cranberrybush.	Northern white-cedar, Austrian pine, white fir, blue spruce, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak, imperial Carolina poplar.

See footnote at end of table.

TABLE 9.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
SvC---------- Swanwick Variant	---	Eastern redcedar, Washington hawthorn, Amur honeysuckle, Amur privet, arrowwood, American cranberrybush.	Green ash, Austrian pine, osageorange.	Pin oak, eastern white pine.	---
SyB2, SyC3, SyD, SyF---------- Sylvan	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
TaD3, TaE--------- Taftown	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
Ud. Udorthents					
UmD3*: Udorthents.					
Sylvan----------	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
UnA---------- Uniontown	---	American cranberrybush, Amur honeysuckle, Amur privet, silky dogwood.	Northern white-cedar, white fir, Washington hawthorn, blue spruce.	Austrian pine, Norway spruce.	Eastern white pine, pin oak.
UnB2, UnB3, UnC3-- Uniontown	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, blue spruce, northern white-cedar, white fir.	Norway spruce-----	Austrian pine, pin oak, eastern white pine.
Vn, Vo---------- Vincennes	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Norway spruce, Austrian pine, northern white-cedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak, imperial Carolina poplar.
Wa---------- Wakeland	---	Amur honeysuckle, Amur privet, American cranberrybush, silky dogwood.	Northern white-cedar, Austrian pine, white fir, blue spruce, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak, imperial Carolina poplar.

See footnote at end of table.

TABLE 9.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
Wk---------- Wilbur	---	Amur honeysuckle, American cranberrybush, Amur privet, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak, imperial Carolina poplar.
Wo---------- Wilhite	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Norway spruce, Austrian pine, northern white-cedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
Wr---------- Wirt	---	Amur honeysuckle, American cranberrybush, Amur privet, silky dogwood.	Austrian pine, northern white-cedar, white fir, Washington hawthorn, blue spruce.	Norway spruce-----	Eastern white pine, pin oak, imperial Carolina poplar.
Zp---------- Zipp	---	Amur honeysuckle, silky dogwood, Amur privet, American cranberrybush.	Northern white-cedar, Norway spruce, Austrian pine, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--RECREATIONAL DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Ad*: Adrian	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.
Rensselaer	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
AlA Alford	Slight	Slight	Slight	Slight	Slight.
AlB2, AlB3 Alford	Slight	Slight	Moderate: slope.	Slight	Slight.
AlC2, AlC3 Alford	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
AlD2, AlD3, AlE Alford	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
AmF*: Alford	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
Parke	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
AnB Alvin	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
AnC2, AnC3 Alvin	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope, droughty.
AnD2, AnD3 Alvin	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Ao. Aquents					
Ar Armiesburg	Severe: flooding.	Slight	Moderate: flooding.	Slight	Moderate: flooding.
As Armiesburg	Severe: flooding.	Slight	Slight	Slight	Slight.
Ay Ayrshire Variant	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
Bd Birds	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.	Severe: ponding.	Severe: ponding, flooding.

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
BlA, BlB Bloomfield	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty, too sandy.
BlC, BlD Bloomfield	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Moderate: droughty, slope, too sandy.
BlF Bloomfield	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: too sandy, slope.	Severe: slope.
Bo, Bp Bonnie	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.	Severe: ponding.	Severe: ponding, flooding.
Cg Chagrin	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
Cr Crawleyville	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
Du*. Dumps					
EkA Elkinsville	Slight	Slight	Slight	Slight	Slight.
EkB Elkinsville	Slight	Slight	Moderate: slope.	Slight	Slight.
Ev Evansville	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
FaG Fairpoint	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, erodes easily.	Severe: small stones, droughty, slope.
GnF Gilpin Variant	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
GuC3 Gudgel	Severe: wetness.	Moderate: slope, wetness, percs slowly.	Severe: slope, wetness.	Severe: erodes easily.	Moderate: wetness, slope.
GuD3 Gudgel	Severe: slope, wetness.	Severe: slope.	Severe: slope, wetness.	Severe: erodes easily.	Severe: slope.
Hd Haymond	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
HhA Henshaw Variant	Severe: flooding, wetness.	Moderate: flooding, wetness, percs slowly.	Severe: wetness, flooding.	Moderate: wetness, flooding.	Severe: flooding.

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
HoB2, HoB3---------- Hosmer	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly.	Slight----------	Slight.
HoC, HoC3---------- Hosmer	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Severe: erodes easily.	Moderate: slope.
IvA, IvB---------- Iva	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
Ju---------- Junius Variant	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
La---------- Landes	Severe: flooding.	Slight----------	Moderate: flooding.	Slight----------	Moderate: flooding.
Ln---------- Lindside	Severe: flooding.	Moderate: flooding, wetness.	Severe: flooding.	Moderate: wetness, flooding.	Severe: flooding.
Ly, Lz---------- Lyles	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
Ma---------- Maplehill	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: wetness, flooding.	Moderate: wetness, flooding.	Severe: flooding.
Md---------- Medway	Severe: flooding.	Moderate: wetness.	Moderate: flooding, wetness.	Moderate: wetness.	Moderate: flooding, wetness.
Me---------- Medway	Severe: flooding.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
Mg---------- Montgomery	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
Mh---------- Moundhaven	Severe: flooding.	Slight----------	Moderate: flooding.	Slight----------	Moderate: droughty, flooding.
MuA---------- Muren	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Slight----------	Slight.
MuB2---------- Muren	Moderate: wetness.	Moderate: wetness.	Moderate: slope, wetness.	Slight----------	Slight.
Nk---------- Newark	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
Nn---------- Nolin	Severe: flooding.	Slight----------	Slight----------	Slight----------	Slight.
No---------- Nolin	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
Pn---------- Patton	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Po Peoga	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Pp, Pv Petrolia	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.	Severe: ponding.	Severe: ponding, flooding.
Pw*. Pits					
Ra, Rb Ragsdale	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
RlA Reesville	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
Rr Rensselaer	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
SbA Skelton	Slight	Slight	Slight	Slight	Slight.
ScA Skelton	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
Sf Steff	Severe: flooding.	Moderate: flooding, wetness.	Severe: flooding.	Moderate: flooding, wetness.	Severe: flooding.
Sr Stendal	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: wetness, flooding.	Moderate: flooding, wetness.	Severe: flooding.
SvC Swanwick Variant	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: droughty, slope.
SyB2 Sylvan	Slight	Slight	Moderate: slope.	Slight	Slight.
SyC3 Sylvan	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
SyD Sylvan	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
SyF Sylvan	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
TaD3, TaE Taftown	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
Ud. Udorthents					
UmD3*: Udorthents.					

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
UmD3*: Sylvan	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
UnA Uniontown	Slight	Slight	Slight	Severe: erodes easily.	Slight.
UnB2, UnB3 Uniontown	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight	Slight.
UnC3 Uniontown	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
Vn Vincennes	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
Vo Vincennes	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.	Severe: ponding.	Severe: ponding, flooding.
Wa Wakeland	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: wetness, flooding.	Moderate: flooding, wetness.	Severe: flooding.
Wk Wilbur	Severe: flooding.	Moderate: flooding, wetness.	Severe: flooding.	Moderate: flooding, wetness.	Severe: flooding.
Wo Wilhite	Severe: flooding, ponding, percs slowly.	Severe: ponding, too clayey, percs slowly.	Severe: too clayey, ponding, flooding.	Severe: ponding, too clayey.	Severe: ponding, flooding, too clayey.
Wr Wirt	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
Zp Zipp	Severe: ponding, percs slowly, too clayey.	Severe: ponding, too clayey, percs slowly.	Severe: too clayey, ponding, percs slowly.	Severe: ponding, too clayey.	Severe: ponding, too clayey.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--WILDLIFE HABITAT

(See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
Ad*:										
Adrian	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Rensselaer	Fair	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
AlA, AlB2, AlB3---- Alford	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
AlC2, AlC3--------- Alford	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
AlD2, AlD3, AlE---- Alford	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
AmF*:										
Alford	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Parke	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
AnB---------- Alvin	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
AnC2, AnC3--------- Alvin	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
AnD2, AnD3--------- Alvin	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Ao. Aquents										
Ar---------- Armiesburg	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
As---------- Armiesburg	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Ay---------- Ayrshire Variant	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Bd---------- Birds	Good	Fair	Good	Good	Fair	Good	Good	Good	Good	Good.
BlA, BlB, BlC, BlD, BlF---------- Bloomfield	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Bo---------- Bonnie	Poor	Fair	Fair	Fair	Poor	Good	Good	Fair	Fair	Good.
Bp---------- Bonnie	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.

See footnote at end of table.

TABLE 11.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
Cg---- Chagrin	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Cr---- Crawleyville	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Du*. Dumps										
EkA, EkB---- Elkinsville	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Ev---- Evansville	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
FaG---- Fairpoint	Very poor.	Very poor.	Poor	Poor	Poor	Very poor.	Very poor.	Very poor.	Poor	Very poor.
GnF---- Gilpin Variant	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
GuC3---- Gudgel	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
GuD3---- Gudgel	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Hd---- Haymond	Good	Good	Fair	Good	Good	Poor	Poor	Good	Good	Poor.
HhA---- Henshaw Variant	Poor	Fair	Fair	Good	Good	Fair	Fair	Fair	Good	Fair.
HoB2, HoB3---- Hosmer	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
HoC, HoC3---- Hosmer	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
IvA---- Iva	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
IvB---- Iva	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Ju---- Junius Variant	Poor	Fair	Fair	Poor	Poor	Fair	Poor	Fair	Poor	Poor.
La---- Landes	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Ln---- Lindside	Poor	Fair	Fair	Good	Good	Poor	Poor	Fair	Good	Poor.
Ly---- Lyles	Fair	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Lz---- Lyles	Fair	Poor	Poor	Good	Good	Good	Good	Fair	Good	Good.

See footnote at end of table.

TABLE 11.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
Ma---------- Maplehill	Poor	Fair	Fair	Good	Good	Fair	Fair	Fair	Good	Fair.
Md, Me---------- Medway	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Mg---------- Montgomery	Fair	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Mh---------- Moundhaven	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
MuA, MuB2---------- Muren	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Nk---------- Newark	Poor	Fair	Fair	Good	Good	Fair	Fair	Fair	Good	Fair.
Nn---------- Nolin	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
No---------- Nolin	Poor	Fair	Fair	Good	Good	Poor	Very poor.	Fair	Fair	Very poor.
Pn---------- Patton	Good	Good	Good	Fair	Fair	Good	Good	Good	Fair	Good.
Po---------- Peoga	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Pp, Pv---------- Petrolia	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Pw*. Pits										
Ra, Rb---------- Ragsdale	Fair	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Poor.
RlA---------- Reesville	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Rr---------- Rensselaer	Fair	Poor	Poor	Fair	Fair	Good	Good	Fair	Fair	Good.
SbA---------- Skelton	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
ScA---------- Skelton	Poor	Fair	Fair	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
Sf---------- Steff	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Sr---------- Stendal	Fair	Fair	Fair	Good	Good	Good	Fair	Fair	Good	Fair.
SvC---------- Swanwick Variant	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.

See footnote at end of table.

TABLE 11.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
SyB2, SyC3--------- Sylvan	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
SyD---------- Sylvan	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
SyF---------- Sylvan	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
TaD3---------- Taftown	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
TaE---------- Taftown	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Ud. Udorthents										
UmD3*: Udorthents.										
Sylvan----------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
UnA---------- Uniontown	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
UnB2, UnB3--------- Uniontown	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
UnC3---------- Uniontown	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Vn---------- Vincennes	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Vo---------- Vincennes	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Wa---------- Wakeland	Poor	Fair	Fair	Good	Good	Fair	Fair	Fair	Good	Fair.
Wk---------- Wilbur	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Wo---------- Wilhite	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Wr---------- Wirt	Poor	Fair	Fair	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
Zp---------- Zipp	Fair	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--BUILDING SITE DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Ad*:						
Adrian	Severe: ponding, cutbanks cave, excess humus.	Severe: ponding, low strength.	Severe: ponding.	Severe: ponding, low strength.	Severe: ponding, low strength, frost action.	Severe: excess humus, ponding.
Rensselaer	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, frost action.	Severe: ponding.
AlA Alford	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
AlB2, AlB3 Alford	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
AlC2, AlC3 Alford	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
AlD2, AlD3, AlE Alford	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope, frost action.	Severe: slope.
AmF*:						
Alford	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope, frost action.	Severe: slope.
Parke	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope, frost action.	Severe: slope.
AnB Alvin	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Moderate: frost action.	Moderate: droughty.
AnC2, AnC3 Alvin	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope, droughty.
AnD2, AnD3 Alvin	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Ao. Aquents						

See footnote at end of table.

TABLE 12.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Ar---------- Armiesburg	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding, frost action.	Moderate: flooding.
As---------- Armiesburg	Slight---------	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, frost action.	Slight.
Ay---------- Ayrshire Variant	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action.	Moderate: wetness.
Bd---------- Birds	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: ponding, flooding.
BlA---------- Bloomfield	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: droughty, too sandy.
BlB---------- Bloomfield	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Moderate: droughty, too sandy.
BlC, BlD---------- Bloomfield	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope, too sandy.
BlF---------- Bloomfield	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Bo, Bp---------- Bonnie	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: ponding, flooding.
Cg---------- Chagrin	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
Cr---------- Crawleyville	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action.	Moderate: wetness.
Du*. Dumps						
EkA---------- Elkinsville	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
EkB---------- Elkinsville	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
Ev---------- Evansville	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.

See footnote at end of table.

TABLE 12.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
FaG---------- Fairpoint	Severe: slope.	Severe: slope, unstable fill.	Severe: slope, unstable fill.	Severe: slope, unstable fill.	Severe: slope, unstable fill.	Severe: small stones, droughty, slope.
GnF---------- Gilpin Variant	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
GuC3---------- Gudgel	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, slope.	Severe: low strength, frost action.	Moderate: wetness, slope.
GuD3---------- Gudgel	Severe: wetness, slope.	Severe: wetness, slope.	Severe: wetness, slope.	Severe: wetness, slope.	Severe: low strength, slope, frost action.	Severe: slope.
Hd---------- Haymond	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding, frost action.	Severe: flooding.
HhA---------- Henshaw Variant	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, flooding, frost action.	Severe: flooding.
HoB2, HoB3-------- Hosmer	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness.	Moderate: shrink-swell, slope.	Severe: frost action.	Slight.
HoC, HoC3--------- Hosmer	Moderate: wetness, slope.	Moderate: shrink-swell, slope.	Moderate: wetness, slope.	Severe: slope.	Severe: frost action.	Moderate: slope.
IvA, IvB---------- Iva	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
Ju---------- Junius Variant	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
La---------- Landes	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
Ln---------- Lindside	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Severe: flooding.
Ly---------- Lyles	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, frost action.	Severe: ponding.
Lz---------- Lyles	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, frost action.	Severe: ponding.
Ma---------- Maplehill	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, frost action.	Severe: flooding.

See footnote at end of table.

TABLE 12.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Md---------- Medway	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding, frost action, low strength.	Moderate: flooding, wetness.
Me---------- Medway	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: frost action, low strength.	Moderate: wetness.
Mg---------- Montgomery	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: low strength, ponding, shrink-swell.	Severe: ponding.
Mh---------- Moundhaven	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: droughty, flooding.
MuA---------- Muren	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: low strength, frost action.	Slight.
MuB2---------- Muren	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: low strength, frost action.	Slight.
Nk---------- Newark	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.
Nn---------- Nolin	Moderate: wetness.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength.	Slight.
No---------- Nolin	Moderate: wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding.	Severe: flooding.
Pn---------- Patton	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
Po---------- Peoga	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness, frost action.	Severe: wetness.
Pp, Pv---------- Petrolia	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: ponding, flooding.
Pw*. Pits						
Ra---------- Ragsdale	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.

See footnote at end of table.

TABLE 12.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Rb---------- Ragsdale	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, frost action.	Severe: ponding.
RlA---------- Reesville	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
Rr---------- Rensselaer	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
SbA---------- Skelton	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, low strength.	Slight.
ScA---------- Skelton	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
Sf---------- Steff	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: low strength, flooding.	Severe: flooding.
Sr---------- Stendal	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, frost action.	Severe: flooding.
SvC---------- Swanwick Variant	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope.	Severe: slope.	Severe: frost action.	Moderate: droughty, slope.
SyB2---------- Sylvan	Slight---------	Moderate: shrink-swell.	Slight---------	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
SyC3---------- Sylvan	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
SyD, SyF---------- Sylvan	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope, frost action.	Severe: slope.
TaD3, TaE--------- Taftown	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, frost action.	Severe: slope.
Ud. Udorthents						
UmD3*: Udorthents.						
Sylvan----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope, frost action.	Severe: slope.

See footnote at end of table.

TABLE 12.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
UnA---------- Uniontown	Moderate: wetness.	Slight---------	Moderate: wetness.	Slight---------	Severe: low strength, frost action.	Slight.
UnB2, UnB3-------- Uniontown	Moderate: wetness.	Slight---------	Moderate: wetness.	Moderate: slope.	Severe: low strength, frost action.	Slight.
UnC3---------- Uniontown	Moderate: wetness, slope.	Moderate: slope.	Moderate: wetness, slope.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
Vn---------- Vincennes	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
Vo---------- Vincennes	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: ponding, flooding, frost action.	Severe: ponding, flooding.
Wa---------- Wakeland	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, frost action.	Severe: flooding.
Wk---------- Wilbur	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding, frost action.	Severe: flooding.
Wo---------- Wilhite	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: ponding, flooding, too clayey.
Wr---------- Wirt	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
Zp---------- Zipp	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: ponding, too clayey.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--SANITARY FACILITIES

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Ad*:					
Adrian	Severe: ponding, poor filter.	Severe: seepage, ponding, excess humus.	Severe: ponding, seepage, too sandy.	Severe: ponding, seepage.	Poor: ponding, too sandy, seepage.
Rensselaer	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
AlA	Slight	Moderate: seepage.	Moderate: too clayey.	Slight	Fair: too clayey.
Alford					
AlB2, AlB3	Slight	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
Alford					
AlC2, AlC3	Moderate: slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
Alford					
AlD2, AlD3, AlE	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Alford					
AmF*:					
Alford	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Parke	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
AnB	Slight	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage.
Alvin					
AnC2, AnC3	Moderate: slope.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage.
Alvin					
AnD2, AnD3	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: slope, seepage.
Alvin					
Ao.					
Aquents					
Ar	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Poor: hard to pack.
Armiesburg					
As	Moderate: flooding, percs slowly.	Moderate: seepage.	Moderate: flooding, too clayey.	Moderate: flooding.	Poor: hard to pack.
Armiesburg					
Ay	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Ayrshire Variant					

See footnote at end of table.

TABLE 13.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Bd---------- Birds	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: ponding.
BlA, BlB---------- Bloomfield	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
BlC, BlD---------- Bloomfield	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
BlF---------- Bloomfield	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
Bo, Bp---------- Bonnie	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: ponding.
Cg---------- Chagrin	Severe: flooding.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Good.
Cr---------- Crawleyville	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Du*. Dumps					
EkA---------- Elkinsville	Slight----------	Moderate: seepage.	Moderate: too clayey.	Slight----------	Fair: too clayey.
EkB---------- Elkinsville	Slight----------	Moderate: seepage, slope.	Moderate: too clayey.	Slight----------	Fair: too clayey.
Ev---------- Evansville	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: hard to pack, ponding.
FaG---------- Fairpoint	Severe: percs slowly, slope, unstable fill.	Severe: slope, unstable fill.	Severe: slope, unstable fill.	Severe: slope, unstable fill.	Poor: small stones, slope.
GnF---------- Gilpin Variant	Severe: thin layer, seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: slope.	Poor: area reclaim, slope, thin layer.
GuC3---------- Gudgel	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: seepage, wetness.	Severe: wetness.	Poor: wetness.

See footnote at end of table.

TABLE 13.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
GuD3---------- Gudgel	Severe: wetness, percs slowly, slope.	Severe: slope, wetness.	Severe: seepage, wetness, slope.	Severe: wetness, slope.	Poor: slope, wetness.
Hd---------- Haymond	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Good.
HhA---------- Henshaw Variant	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
HoB2, HoB3---------- Hosmer	Severe: wetness, percs slowly.	Moderate: slope.	Moderate: wetness, too clayey.	Moderate: wetness.	Fair: too clayey, wetness.
HoC, HoC3---------- Hosmer	Severe: wetness, percs slowly.	Severe: slope.	Moderate: wetness, slope, too clayey.	Moderate: wetness, slope.	Fair: too clayey, slope, wetness.
IvA, IvB---------- Iva	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Ju---------- Junius Variant	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
La---------- Landes	Severe: flooding, poor filter.	Severe: seepage, flooding.	Severe: flooding, seepage, too sandy.	Severe: flooding, seepage.	Poor: seepage, too sandy.
Ln---------- Lindside	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: too clayey, wetness.
Ly---------- Lyles	Severe: ponding.	Severe: seepage, ponding.	Severe: seepage, ponding.	Severe: ponding.	Poor: ponding.
Lz---------- Lyles	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
Ma---------- Maplehill	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
Md---------- Medway	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness, seepage.	Fair: wetness.
Me---------- Medway	Severe: wetness.	Severe: wetness, seepage.	Severe: seepage, wetness.	Severe: wetness, seepage.	Fair: wetness.
Mg---------- Montgomery	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.

See footnote at end of table.

TABLE 13.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Mh---------- Moundhaven	Severe: flooding, poor filter.	Severe: seepage, flooding.	Severe: flooding, seepage, too sandy.	Severe: flooding, seepage.	Poor: seepage, too sandy.
MuA, MuB2---------- Muren	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
Nk---------- Newark	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
Nn---------- Nolin	Severe: wetness.	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey.
No---------- Nolin	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: too clayey.
Pn---------- Patton	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
Po---------- Peoga	Severe: wetness, percs slowly.	Slight----------	Severe: wetness.	Severe: wetness.	Poor: wetness.
Pp, Pv---------- Petrolia	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: ponding.
Pw*. Pits					
Ra, Rb---------- Ragsdale	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
RlA---------- Reesville	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Rr---------- Rensselaer	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
SbA---------- Skelton	Moderate: percs slowly.	Moderate: seepage.	Moderate: too clayey.	Slight----------	Fair: too clayey.
ScA---------- Skelton	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Fair: too clayey.
Sf---------- Steff	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: too clayey, wetness.
Sr---------- Stendal	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.

See footnote at end of table.

TABLE 13.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
SvC---------- Swanwick Variant	Severe: percs slowly.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: seepage, small stones.
SyB2---------- Sylvan	Slight----------	Moderate: seepage, slope.	Slight----------	Slight----------	Good.
SyC3---------- Sylvan	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
SyD, SyF---------- Sylvan	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
TaD3, TaE---------- Taftown	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Ud. Udorthents					
UmD3*: Udorthents.					
Sylvan----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
UnA---------- Uniontown	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness.
UnB2, UnB3---------- Uniontown	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
UnC3---------- Uniontown	Moderate: wetness, percs slowly.	Severe: wetness, slope.	Severe: wetness.	Severe: wetness, slope.	Fair: too clayey, slope, wetness.
Vn---------- Vincennes	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
Vo---------- Vincennes	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: ponding.
Wa---------- Wakeland	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
Wk---------- Wilbur	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: wetness.
Wo---------- Wilhite	Severe: flooding, ponding, percs slowly.	Severe: flooding.	Severe: flooding, ponding, too clayey.	Severe: flooding, ponding.	Poor: too clayey, hard to pack, ponding.

See footnote at end of table.

TABLE 13.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Wr---------- Wirt	Severe: flooding.	Severe: seepage, flooding.	Severe: flooding, seepage.	Severe: flooding.	Fair: thin layer.
Zp---------- Zipp	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--CONSTRUCTION MATERIALS

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Ad*:				
Adrian	Poor: wetness.	Probable	Improbable: too sandy.	Poor: wetness, excess humus.
Rensselaer	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
AlA, AlB2, AlB3 Alford	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
AlC2, AlC3 Alford	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
AlD2, AlD3, AlE Alford	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
AmF*:				
Alford	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Parke	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
AnB, AnC2, AnC3 Alvin	Good	Probable	Improbable: too sandy.	Poor: too sandy.
AnD2, AnD3 Alvin	Fair: slope.	Probable	Improbable: too sandy.	Poor: too sandy, slope.
Ao. Aquents				
Ar, As Armiesburg	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Ay Ayrshire Variant	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
Bd Birds	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
BlA, BlB, BlC, BlD Bloomfield	Good	Probable	Improbable: too sandy.	Poor: too sandy.
BlF Bloomfield	Poor: slope.	Probable	Improbable: too sandy.	Poor: too sandy, slope.
Bo, Bp Bonnie	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.

See footnote at end of table.

TABLE 14.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Cg---------- Chagrin	Good----------	Improbable: excess fines.	Improbable: excess fines.	Good.
Cr---------- Crawleyville	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Du*. Dumps				
EkA, EkB---------- Elkinsville	Good----------	Improbable: excess fines.	Improbable: excess fines.	Good.
Ev---------- Evansville	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
FaG---------- Fairpoint	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
GnF---------- Gilpin Variant	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
GuC3---------- Gudgel	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, slope.
GuD3---------- Gudgel	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Hd---------- Haymond	Good----------	Improbable: excess fines.	Improbable: excess fines.	Good.
HhA---------- Henshaw Variant	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
HoB2, HoB3---------- Hosmer	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
HoC, HoC3---------- Hosmer	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
IvA, IvB---------- Iva	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
Ju---------- Junius Variant	Poor: wetness.	Probable----------	Improbable: too sandy.	Poor: wetness.
La---------- Landes	Good----------	Probable----------	Improbable: too sandy.	Fair: too sandy, small stones, thin layer.

See footnote at end of table.

TABLE 14.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Ln---------- Lindside	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Ly---------- Lyles	Poor: wetness.	Probable----------	Improbable: too sandy.	Poor: wetness.
Lz---------- Lyles	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Ma---------- Maplehill	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
Md, Me---------- Medway	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
Mg---------- Montgomery	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, too clayey.
Mh---------- Moundhaven	Good----------	Probable----------	Improbable: too sandy.	Poor: too sandy.
MuA, MuB2---------- Muren	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
Nk---------- Newark	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Nn, No---------- Nolin	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Pn---------- Patton	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Po---------- Peoga	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Pp, Pv---------- Petrolia	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Pw*. Pits				
Ra, Rb---------- Ragsdale	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
RlA---------- Reesville	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
Rr---------- Rensselaer	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
SbA, ScA---------- Skelton	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.

See footnote at end of table.

TABLE 14.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Sf---------- Steff	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, area reclaim.
Sr---------- Stendal	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
SvC---------- Swanwick Variant	Good----------	Improbable: small stones.	Probable----------	Poor: small stones, area reclaim.
SyB2---------- Sylvan	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
SyC3---------- Sylvan	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
SyD---------- Sylvan	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
SyF---------- Sylvan	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
TaD3, TaE---------- Taftown	Fair: low strength, slope, area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Ud. Udorthents				
UmD3*: Udorthents.				
Sylvan----------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
UnA---------- Uniontown	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
UnB2, UnB3---------- Uniontown	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
UnC3---------- Uniontown	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
Vn, Vo---------- Vincennes	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Wa---------- Wakeland	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
Wk---------- Wilbur	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
Wo---------- Wilhite	Poor: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.

See footnote at end of table.

TABLE 14.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Wr Wirt	Good	Probable	Improbable: too sandy.	Fair: small stones, area reclaim.
Zp Zipp	Poor: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--WATER MANAGEMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Ad*: Adrian	Severe: seepage.	Severe: seepage, ponding, piping.	Ponding, frost action, subsides.	Ponding, soil blowing.	Ponding, soil blowing, too sandy.	Wetness.
Rensselaer	Moderate: seepage.	Severe: ponding.	Ponding, frost action.	Ponding, soil blowing.	Ponding, soil blowing.	Wetness.
AlA Alford	Moderate: seepage.	Moderate: piping.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
AlB2, AlB3 Alford	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
AlC2, AlC3, AlD2, AlD3, AlE Alford	Severe: slope.	Moderate: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
AmF*: Alford	Severe: slope.	Moderate: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
Parke	Severe: slope.	Moderate: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
AnB Alvin	Severe: seepage.	Severe: piping, seepage.	Deep to water	Slope, soil blowing, droughty.	Soil blowing---	Droughty.
AnC2, AnC3, AnD2, AnD3 Alvin	Severe: seepage, slope.	Severe: piping, seepage.	Deep to water	Slope, soil blowing, droughty.	Slope, soil blowing.	Slope, droughty.
Ao. Aquents						
Ar Armiesburg	Moderate: seepage.	Moderate: hard to pack.	Deep to water	Flooding-------	Favorable------	Favorable.
As Armiesburg	Moderate: seepage.	Moderate: hard to pack.	Deep to water	Favorable------	Favorable------	Favorable.
Ay Ayrshire Variant	Moderate: seepage.	Severe: piping, wetness.	Frost action---	Wetness, soil blowing.	Wetness, soil blowing.	Wetness.
Bd Birds	Slight---------	Severe: ponding.	Ponding, flooding, frost action.	Ponding, erodes easily, flooding.	Erodes easily, ponding.	Wetness, erodes easily.

See footnote at end of table.

TABLE 15.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
BlA, BlB---------- Bloomfield	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty, rooting depth.
BlC, BlD, BlF----- Bloomfield	Severe: seepage, slope.	Severe: seepage, piping.	Deep to water	Droughty, fast intake, soil blowing.	Slope, too sandy, soil blowing.	Slope, droughty, rooting depth.
Bo, Bp---------- Bonnie	Slight---------	Severe: ponding.	Ponding, flooding, frost action.	Ponding, erodes easily, flooding.	Erodes easily, ponding.	Wetness, erodes easily.
Cg---------- Chagrin	Moderate: seepage.	Severe: piping.	Deep to water	Flooding-------	Favorable------	Favorable.
Cr---------- Crawleyville	Moderate: seepage.	Severe: piping, wetness.	Frost action---	Wetness--------	Wetness--------	Wetness.
Du*. Dumps						
EkA---------- Elkinsville	Moderate: seepage.	Moderate: thin layer, piping.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
EkB---------- Elkinsville	Moderate: seepage, slope.	Moderate: thin layer, piping.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
Ev---------- Evansville	Moderate: seepage.	Severe: ponding.	Ponding, frost action.	Ponding, erodes easily.	Erodes easily, ponding.	Wetness, erodes easily.
FaG---------- Fairpoint	Severe: slope.	Severe: piping.	Deep to water	Slope, large stones, droughty.	Slope, large stones, erodes easily.	Large stones, slope, erodes easily.
GnF---------- Gilpin Variant	Severe: slope.	Severe: piping.	Deep to water	Slope, thin layer, erodes easily.	Slope, area reclaim, erodes easily.	Slope, erodes easily, area reclaim.
GuC3, GuD3-------- Gudgel	Severe: slope.	Moderate: thin layer, wetness.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Slope, erodes easily, wetness.	Wetness, slope, erodes easily.
Hd---------- Haymond	Moderate: seepage.	Severe: piping.	Deep to water	Erodes easily, flooding.	Erodes easily	Erodes easily.
HhA---------- Henshaw Variant	Slight---------	Severe: thin layer, wetness.	Flooding, frost action.	Wetness, erodes easily, flooding.	Erodes easily, wetness.	Wetness, erodes easily.
HoB2, HoB3-------- Hosmer	Moderate: seepage, slope.	Severe: piping.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Erodes easily, wetness.	Erodes easily, rooting depth.
HoC, HoC3--------- Hosmer	Severe: slope.	Severe: piping.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Slope, erodes easily, wetness.	Slope, erodes easily, rooting depth.

See footnote at end of table.

TABLE 15.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
IvA---- Iva	Moderate: seepage.	Severe: thin layer, wetness.	Frost action---	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
IvB---- Iva	Moderate: seepage, slope.	Severe: thin layer, wetness.	Frost action, slope.	Wetness, slope, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
Ju---- Junius Variant	Moderate: seepage.	Severe: piping, wetness.	Favorable------	Wetness, fast intake, soil blowing.	Wetness, soil blowing.	Wetness.
La---- Landes	Severe: seepage.	Severe: seepage, piping.	Deep to water	Soil blowing---	Too sandy, soil blowing.	Rooting depth.
Ln---- Lindside	Moderate: seepage.	Severe: piping.	Flooding, frost action.	Flooding, wetness, erodes easily.	Wetness, erodes easily.	Erodes easily.
Ly---- Lyles	Severe: seepage.	Severe: piping, ponding.	Ponding, frost action.	Ponding, soil blowing.	Ponding, soil blowing.	Wetness.
Lz---- Lyles	Moderate: seepage.	Severe: ponding.	Ponding, frost action.	Ponding, soil blowing.	Ponding, soil blowing.	Wetness.
Ma---- Maplehill	Moderate: seepage.	Severe: piping, wetness.	Flooding, frost action.	Wetness, erodes easily, flooding.	Erodes easily, wetness.	Wetness, erodes easily.
Md---- Medway	Severe: seepage.	Severe: piping, wetness.	Frost action, flooding.	Wetness, flooding.	Wetness--------	Favorable.
Me---- Medway	Severe: seepage.	Severe: piping, wetness.	Frost action---	Wetness--------	Wetness--------	Favorable.
Mg---- Montgomery	Slight---------	Severe: hard to pack, ponding.	Ponding, percs slowly.	Ponding, percs slowly, erodes easily.	Erodes easily, ponding, percs slowly.	Wetness, erodes easily, percs slowly.
Mh---- Moundhaven	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, soil blowing, flooding.	Too sandy, soil blowing.	Droughty.
MuA---- Muren	Moderate: seepage.	Moderate: thin layer, piping, wetness.	Frost action---	Wetness, erodes easily.	Erodes easily, wetness.	Erodes easily.
MuB2---- Muren	Moderate: seepage, slope.	Moderate: thin layer, piping, wetness.	Frost action, slope.	Wetness, slope, erodes easily.	Erodes easily, wetness.	Erodes easily.
Nk---- Newark	Moderate: seepage.	Severe: piping, wetness.	Flooding, frost action.	Wetness, erodes easily, flooding.	Erodes easily, wetness.	Wetness, erodes easily.

See footnote at end of table.

TABLE 15.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Nn---------- Nolin	Severe: seepage.	Severe: piping.	Deep to water, frost action.	Erodes easily	Erodes easily	Erodes easily.
No---------- Nolin	Severe: seepage.	Severe: piping.	Deep to water, frost action.	Erodes easily, flooding.	Erodes easily	Erodes easily.
Pn---------- Patton	Slight---------	Severe: ponding.	Ponding, frost action.	Ponding--------	Ponding--------	Wetness.
Po---------- Peoga	Slight---------	Severe: wetness.	Percs slowly, frost action.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Pp, Pv---------- Petrolia	Slight---------	Severe: ponding.	Ponding, percs slowly, flooding.	Ponding, percs slowly, flooding.	Ponding, percs slowly.	Wetness, percs slowly.
Pw*. Pits						
Ra---------- Ragsdale	Moderate: seepage.	Severe: ponding.	Ponding, frost action.	Ponding--------	Ponding--------	Wetness.
Rb---------- Ragsdale	Moderate: seepage.	Severe: piping, ponding.	Ponding, frost action.	Ponding, erodes easily.	Erodes easily, ponding.	Wetness, erodes easily.
RlA---------- Reesville	Moderate: seepage.	Severe: piping.	Frost action---	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
Rr---------- Rensselaer	Moderate: seepage.	Severe: ponding.	Ponding, frost action.	Ponding, soil blowing.	Ponding, soil blowing.	Wetness.
SbA---------- Skelton	Moderate: seepage.	Moderate: piping.	Deep to water	Favorable------	Favorable------	Favorable.
ScA---------- Skelton	Moderate: seepage.	Moderate: piping.	Deep to water	Flooding-------	Favorable------	Favorable.
Sf---------- Steff	Moderate: seepage.	Severe: piping, wetness.	Flooding, frost action.	Wetness, erodes easily.	Erodes easily, wetness.	Erodes easily.
Sr---------- Stendal	Moderate: seepage.	Severe: piping, wetness.	Flooding, frost action.	Wetness, erodes easily, flooding.	Erodes easily, wetness.	Wetness, erodes easily.
SvC---------- Swanwick Variant	Severe: seepage, slope.	Severe: seepage.	Deep to water	Slope, droughty, rooting depth.	Slope, erodes easily.	Slope, erodes easily, droughty.
SyB2---------- Sylvan	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
SyC3, SyD, SyF---- Sylvan	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
TaD3, TaE--------- Taftown	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.

See footnote at end of table.

TABLE 15.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Ud. Udorthents						
UmD3*: Udorthents.						
Sylvan	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
UnA Uniontown	Moderate: seepage.	Severe: piping.	Frost action	Wetness, erodes easily.	Erodes easily, wetness.	Erodes easily.
UnB2, UnB3 Uniontown	Moderate: seepage.	Severe: piping.	Frost action, slope.	Slope, erodes easily, wetness.	Erodes easily, wetness.	Erodes easily.
UnC3 Uniontown	Moderate: seepage.	Severe: piping.	Frost action, slope.	Slope, erodes easily, wetness.	Slope, erodes easily, wetness.	Slope, erodes easily.
Vn Vincennes	Slight	Severe: ponding.	Ponding, percs slowly, frost action.	Ponding, percs slowly, erodes easily.	Erodes easily, ponding, percs slowly.	Wetness, erodes easily, percs slowly.
Vo Vincennes	Slight	Severe: ponding.	Ponding, percs slowly, flooding.	Ponding, percs slowly, erodes easily.	Erodes easily, ponding, percs slowly.	Wetness, erodes easily, percs slowly.
Wa Wakeland	Moderate: seepage.	Severe: piping, wetness.	Flooding, frost action.	Wetness, erodes easily, flooding.	Erodes easily, wetness.	Wetness, erodes easily.
Wk Wilbur	Moderate: seepage.	Severe: piping, wetness.	Flooding, frost action.	Wetness, erodes easily, flooding.	Erodes easily, wetness.	Erodes easily.
Wo Wilhite	Slight	Severe: ponding.	Ponding, percs slowly, flooding.	Ponding, slow intake, flooding.	Ponding, percs slowly.	Wetness, percs slowly.
Wr Wirt	Severe: seepage.	Severe: piping.	Deep to water	Erodes easily, flooding.	Erodes easily	Erodes easily.
Zp Zipp	Slight	Severe: ponding.	Ponding, percs slowly.	Ponding, slow intake, percs slowly.	Ponding, percs slowly.	Wetness, percs slowly.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--ENGINEERING INDEX PROPERTIES

(The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated)

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Ad*:											
Adrian----------	0-34	Sapric material	PT	A-8	---	---	---	---	---	---	---
	34-60	Sand, loamy sand, fine sand.	SP, SM	A-2, A-3, A-1	0	80-100	60-100	35-75	0-30	---	NP
Rensselaer------	0-9	Mucky loam-------	CL, CL-ML	A-4, A-6	0	95-100	90-100	85-95	60-75	20-30	5-11
	9-24	Mucky silty clay loam, clay loam, loam.	CL	A-6, A-4	0	95-100	90-100	80-100	50-80	25-40	8-20
	24-48	Silty clay loam, clay loam.	CL, SC	A-6, A-4, A-2-4, A-2-6	0	95-100	90-100	70-90	30-55	25-35	8-15
	48-60	Stratified sand to silt loam.	CL, SC, ML, SM	A-4, A-2	0	95-100	90-100	45-95	25-85	<25	2-10
A1A, A1B2--------	0-12	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-100	20-30	5-15
Alford	12-70	Silty clay loam, silt loam.	CL	A-6, A-4	0	100	100	90-100	80-100	25-35	8-15
	70-80	Silt loam, silt	ML, CL-ML, CL	A-4	0	100	100	90-100	70-100	<25	NP-10
A1B3----------	0-7	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-100	20-30	5-15
Alford	7-52	Silty clay loam, silt loam.	CL	A-6, A-4	0	100	100	90-100	80-100	25-35	8-15
	52-60	Silt loam, silt	ML, CL-ML, CL	A-4	0	100	100	90-100	70-100	<25	NP-10
A1C2----------	0-12	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-100	20-30	5-15
Alford	12-70	Silty clay loam, silt loam.	CL	A-6, A-4	0	100	100	90-100	80-100	25-35	8-15
	70-80	Silt loam, silt	ML, CL-ML, CL	A-4	0	100	100	90-100	70-100	<25	NP-10
A1C3----------	0-7	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-100	20-30	5-15
Alford	7-52	Silty clay loam, silt loam.	CL	A-6, A-4	0	100	100	90-100	80-100	25-35	8-15
	52-80	Silt loam, silt	ML, CL-ML, CL	A-4	0	100	100	90-100	70-100	<25	NP-10
A1D2----------	0-12	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-100	20-30	5-15
Alford	12-70	Silty clay loam, silt loam.	CL	A-6, A-4	0	100	100	90-100	80-100	25-35	8-15
	70-75	Silt loam, silt	ML, CL-ML, CL	A-4	0	100	100	90-100	70-100	<25	NP-10
A1D3----------	0-7	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-100	20-30	5-15
Alford	7-52	Silty clay loam, silt loam.	CL	A-6, A-4	0	100	100	90-100	80-100	25-35	8-15
	52-80	Silt loam, silt	ML, CL-ML, CL	A-4	0	100	100	90-100	70-100	<25	NP-10
A1E----------	0-12	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-100	20-30	5-15
Alford	12-70	Silty clay loam, silt loam.	CL	A-6, A-4	0	100	100	90-100	80-100	25-35	8-15
	70-80	Silt loam, silt	ML, CL-ML, CL	A-4	0	100	100	90-100	70-100	<25	NP-10

See footnote at end of table.

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
AmF*:											
Alford	0-12	Silt loam	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-100	20-30	5-15
	12-70	Silty clay loam, silt loam.	CL	A-6, A-4	0	100	100	90-100	80-100	25-35	8-15
	70-80	Silt loam, silt	ML, CL-ML, CL	A-4	0	100	100	90-100	70-100	<25	NP-10
Parke	0-8	Silt loam	CL-ML, CL	A-4, A-6	0	100	100	90-100	70-100	20-35	7-15
	8-27	Silt loam	CL, ML	A-6, A-4	0	95-100	95-100	90-100	80-100	25-40	7-15
	27-80	Sandy clay loam, loam.	SC, CL, ML, SM	A-2, A-6, A-4	0-3	90-100	85-100	55-90	30-60	25-35	7-15
AnB, AnC2	0-9	Fine sandy loam	SM, ML	A-4, A-2	0	100	100	80-95	30-60	<25	NP-4
Alvin	9-38	Fine sandy loam, sandy loam, loam.	SM, SC, CL, ML	A-2, A-4, A-6	0	100	100	90-100	20-80	15-40	NP-15
	38-70	Fine sand, fine sandy loam, loamy fine sand.	SP, SP-SM, SM	A-2, A-3	0	95-100	90-100	70-95	4-35	<20	NP-4
AnC3	0-5	Fine sandy loam	SM, ML	A-4, A-2	0	100	100	80-95	30-60	<25	NP-4
Alvin	5-36	Fine sandy loam, sandy loam, loam.	SM, SC, CL, ML	A-2, A-4, A-6	0	100	100	90-100	20-80	15-40	NP-15
	36-60	Sand, loamy sand, loamy fine sand.	SP, SP-SM, SM	A-2, A-3	0	95-100	90-100	70-95	4-35	<20	NP-4
AnD2	0-6	Fine sandy loam	SM, ML	A-4, A-2	0	100	100	80-95	30-60	<25	NP-4
Alvin	6-36	Fine sandy loam, sandy loam, loam.	SM, SC, CL, ML	A-2, A-4, A-6	0	100	100	90-100	20-80	15-40	NP-15
	36-60	Fine sand, fine sandy loam, loamy sand.	SP, SP-SM, SM	A-2, A-3	0	95-100	90-100	70-95	4-35	<20	NP-4
AnD3	0-4	Fine sandy loam	SM, ML	A-4, A-2	0	100	100	80-95	30-60	<25	NP-4
Alvin	4-32	Fine sandy loam, sandy loam, loam.	SM, SC, CL, ML	A-2, A-4, A-6	0	100	100	90-100	20-80	15-40	NP-15
	32-60	Fine sand, fine sandy loam, loamy fine sand.	SP, SP-SM, SM	A-2, A-3	0	95-100	90-100	70-95	4-35	<20	NP-4
Ao.											
Aquents											
Ar, As	0-18	Silt loam	CL, CH	A-6, A-7	0	100	100	95-100	85-95	35-55	20-35
Armiesburg	18-60	Silty clay loam, silt loam, clay loam.	CL, CH	A-6, A-7	0	100	100	95-100	85-95	35-55	20-35
Ay	0-8	Fine sandy loam	SM, ML	A-4	0	100	100	70-85	40-55	<20	NP-3
Ayrshire Variant	8-14	Fine sandy loam	SM, ML	A-4	0	100	100	70-85	40-55	<20	NP-3
	14-54	Loam, fine sandy loam.	ML, CL, SM, SC	A-4	0	100	100	70-95	40-75	<25	3-8
	54-80	Fine sandy loam	ML, CL-ML, SM, SM-SC	A-4	0	100	100	70-85	40-55	<20	3-6
Bd	0-12	Silt loam	CL	A-4, A-6	0	100	95-100	90-100	80-100	24-34	8-15
Birds	12-80	Silt loam	CL	A-4, A-6	0	100	95-100	90-100	80-100	24-34	8-15

See footnote at end of table.

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
B1A, B1B, B1C, B1D, B1F-------- Bloomfield	0-8	Sand----------	SM, SP, SP-SM	A-2-4, A-3	0	100	100	60-90	4-20	---	NP
	8-30	Fine sand, loamy sand, sand.	SP, SM, SP-SM	A-2-4, A-3	0	100	100	70-90	4-35	---	NP
	30-80	Fine sand, loamy fine sand, sand.	SM, SP, SP-SM	A-2-4, A-3	0	100	100	65-90	4-35	<20	NP-3
Bo----------	0-8	Silt loam--------	CL	A-4, A-6	0	100	100	95-100	90-100	27-34	8-12
Bonnie	8-17	Silt loam--------	CL	A-4, A-6	0	100	100	95-100	90-100	27-34	8-12
	17-60	Silt loam, silty clay loam.	CL	A-4, A-6	0	100	100	90-100	80-100	25-39	8-15
Bp----------	0-4	Silt loam--------	CL	A-4, A-6	0	100	100	95-100	90-100	25-35	8-15
Bonnie	4-60	Silt loam--------	CL	A-4, A-6	0	100	100	95-100	90-100	25-35	8-15
Cg----------	0-6	Silt loam--------	ML, CL, CL-ML	A-4	0	95-100	85-100	80-100	70-90	20-35	2-10
Chagrin	6-46	Silt loam, loam, sandy loam.	ML, SM	A-4, A-2, A-6	0	90-100	75-100	55-90	30-80	20-40	NP-14
	46-60	Stratified silt loam to sand.	ML, SM	A-4, A-2	0	85-100	75-100	50-85	15-80	20-40	NP-10
Cr----------	0-9	Loam----------	CL-ML, CL, ML	A-4	0	100	100	85-95	60-75	<25	4-8
Crawleyville	9-37	Sandy clay loam, loam.	CL-ML, CL, SM-SC, SC	A-4, A-6	0	100	100	80-95	35-75	20-35	5-15
	37-50	Fine sandy loam, sandy loam.	CL-ML, CL, SM-SC, SC	A-4, A-2-4	0	100	100	60-85	30-55	<25	4-8
	50-60	Fine sandy loam, sandy loam.	ML, CL-ML, SM, SM-SC	A-4, A-2-4	0	100	100	60-85	30-55	<25	NP-6
Du*. Dumps											
EkA, EkB----------	0-10	Silt loam--------	CL-ML, ML	A-4	0	100	100	90-100	70-90	<25	NP-7
Elkinsville	10-26	Silty clay loam, silt loam.	CL	A-6, A-4	0	100	100	85-100	65-90	20-35	7-15
	26-80	Silty clay loam, sandy loam, loam.	CL, CL-ML, SC, SM-SC	A-4, A-6	0	100	90-100	60-100	40-80	20-35	5-15
Ev----------	0-9	Silt loam--------	CL, CL-ML, ML	A-4, A-6	0	100	100	90-100	70-98	25-40	3-15
Evansville	9-40	Silty clay loam, silt loam.	CL, CH	A-6, A-7	0	100	100	95-100	85-98	35-55	20-35
	40-65	Stratified silt loam to silty clay loam.	CL	A-6, A-7	0	100	100	90-100	70-98	30-45	10-25
FaG----------	0-5	Shaly silt loam	CL, CL-ML, SC, GC	A-4, A-6, A-2	5-15	55-90	45-85	40-85	30-75	20-40	4-18
Fairpoint	5-60	Extremely shaly silt loam, very shaly silt loam, shaly loam.	GC, CL, CL-ML, SC	A-4, A-6, A-7, A-2	15-30	55-75	20-65	10-65	5-60	25-50	4-24

See footnote at end of table.

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
GnF---------- Gilpin Variant	0-8	Silt loam--------	CL, ML, CL-ML	A-4	0	100	95-100	90-100	70-90	<25	3-10
	8-16	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	95-100	90-100	70-90	20-30	5-11
	16-34	Silt loam, loam	CL, CL-ML	A-6, A-4	0-2	90-100	85-100	70-100	50-75	20-35	7-15
	34	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
GuC3, GuD3------- Gudgel	0-6	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	95-100	90-100	80-100	25-35	5-15
	6-12	Silt loam--------	CL	A-6	0	100	95-100	90-100	80-100	30-40	10-15
	12-29	Silt loam--------	CL	A-6	0	100	95-100	90-100	80-100	30-40	10-15
	29-51	Silty clay loam	CL	A-6, A-7	0-3	95-100	85-100	75-100	60-95	35-45	15-20
	51	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Hd---------- Haymond	0-8	Silt loam--------	ML	A-4	0	100	100	90-100	80-90	27-36	4-10
	8-45	Silt loam--------	ML	A-4	0	100	100	90-100	80-90	27-36	4-10
	45-60	Fine sandy loam, silt loam, loam.	ML, SM	A-4	0	95-100	90-100	80-100	35-90	27-36	4-10
HhA---------- Henshaw Variant	0-7	Silt loam--------	ML, CL-ML, CL	A-4	0	100	100	90-100	85-100	<25	4-8
	7-11	Silt loam--------	CL, CL-ML	A-6, A-4	0	100	100	90-100	85-100	25-35	5-12
	11-40	Silty clay loam	CL, ML	A-6, A-7	0	100	100	95-100	90-95	35-45	10-20
	40-60	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	90-100	85-100	25-35	5-12
HoB2---------- Hosmer	0-8	Silt loam--------	ML, CL-ML, CL	A-4	0	100	100	90-100	70-90	<25	3-10
	8-23	Silt loam, silty clay loam.	CL, CL-ML, ML	A-4, A-6	0	100	100	90-100	70-95	25-35	5-15
	23-80	Silt loam, silty clay loam.	CL, CL-ML, ML	A-4, A-6	0	100	100	90-100	70-95	20-30	5-15
HoB3---------- Hosmer	0-7	Silt loam--------	ML, CL-ML, CL	A-4	0	100	100	90-100	70-90	<25	3-10
	7-14	Silt loam, silty clay loam.	CL, CL-ML, ML	A-4, A-6	0	100	100	90-100	70-95	25-35	5-15
	14-80	Silt loam, silty clay loam.	CL, CL-ML, ML	A-4, A-6	0	100	100	90-100	70-95	20-30	5-15
HoC---------- Hosmer	0-8	Silt loam--------	ML, CL-ML, CL	A-4	0	100	100	90-100	70-90	<25	3-10
	8-23	Silt loam, silty clay loam.	CL, CL-ML, ML	A-4, A-6	0	100	100	90-100	70-95	25-35	5-15
	23-80	Silt loam, silty clay loam.	CL, CL-ML, ML	A-4, A-6	0	100	100	90-100	70-95	20-30	5-15
HoC3---------- Hosmer	0-7	Silt loam--------	ML, CL-ML, CL	A-4	0	100	100	90-100	70-90	<25	3-10
	7-14	Silt loam, silty clay loam.	CL, CL-ML, ML	A-4, A-6	0	100	100	90-100	70-95	25-35	5-15
	14-80	Silt loam, silty clay loam.	CL, CL-ML, ML	A-4, A-6	0	100	100	90-100	70-95	20-30	5-15
IvA, IvB--------- Iva	0-18	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-100	25-35	5-15
	18-49	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	90-100	80-100	35-50	15-30
	49-60	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-90	25-35	5-15

See footnote at end of table.

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Ju---------- Junius Variant	0-8	Loamy sand-------	SM-SC, SM	A-2-4	0	100	100	50-80	15-35	<20	NP-5
	8-19	Loamy fine sand, loamy sand.	SM-SC, SM	A-2-4	0	100	100	50-80	15-35	<20	NP-5
	19-46	Sandy loam, fine sandy loam.	SM, SM-SC, ML, CL-ML	A-2-4, A-4	0	100	100	60-85	30-55	<25	3-8
	46-60	Fine sand, sand	SP-SM, SM, SM-SC	A-2-4, A-3	0	100	100	50-80	5-35	<20	NP-5
La---------- Landes	0-16	Sandy loam-------	SM, SC, SM-SC	A-4, A-2	0	100	70-100	70-95	20-50	<25	NP-10
	16-40	Sandy loam, fine sandy loam, loamy fine sand.	SM, CL-ML, SC, SM-SC	A-2, A-4	0	100	80-100	70-95	15-60	<25	NP-10
	40-70	Stratified sand to silt loam.	SM, SP-SM, SC, SM-SC	A-2, A-4	0	100	80-100	70-85	10-50	<30	NP-10
Ln---------- Lindside	0-7	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0	100	95-100	80-100	55-90	20-35	2-15
	7-60	Silty clay loam, silt loam.	CL, ML, CL-ML	A-4, A-6	0	100	95-100	90-100	70-95	25-40	4-18
	60-70	Stratified silty clay loam to silt loam.	CL, ML, SM, SC	A-2, A-4, A-6	0	60-100	55-100	45-100	30-95	20-40	4-18
Ly---------- Lyles	0-24	Fine sandy loam	SM, SM-SC	A-2-4, A-4	0	95-100	95-100	55-80	25-50	<20	NP-5
	24-51	Sandy loam, loam, fine sandy loam.	SM-SC, SC, CL-ML, CL	A-4, A-6	0	95-100	95-100	50-80	35-60	20-30	4-14
	51-60	Loamy fine sand, sand.	SP-SM, SM, SM-SC	A-2-4, A-1-b, A-3	0	95-100	95-100	45-75	5-30	<20	NP-5
Lz---------- Lyles	0-11	Sandy loam-------	SM, SC, SM-SC	A-4, A-2-4	0	100	95-100	55-70	25-40	<25	3-8
	11-34	Sandy loam-------	SM, SC, SM-SC	A-2-4, A-4	0	100	95-100	55-70	25-40	<25	3-8
	34-62	Sandy loam-------	SC, SM-SC	A-2-4, A-4	0	95-100	95-100	55-70	25-40	20-30	5-10
	62-70	Sandy clay loam	SC	A-2-6, A-6, A-2-4, A-4	0	95-100	95-100	75-90	25-40	20-30	7-12
Ma---------- Maplehill	0-26	Silt loam--------	CL-ML, CL	A-4	0	100	100	90-100	70-90	20-30	4-9
	26-47	Silt loam--------	CL-ML, CL	A-4	0	100	100	90-100	70-90	20-30	4-9
	47-80	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-90	25-40	7-18
Md, Me---------- Medway	0-19	Loam----------	ML, CL, CL-ML	A-4, A-6	0	100	100	90-100	70-80	20-40	3-15
	19-57	Loam, clay loam, sandy clay loam.	ML, CL, CL-ML	A-4, A-6, A-7	0	95-100	80-95	75-90	70-90	20-45	4-20
	57-70	Stratified sandy loam to clay loam.	ML, CL, SM-SC, SM	A-4, A-2, A-6	0	90-100	75-100	45-95	25-75	15-30	NP-15

See footnote at end of table.

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Mg Montgomery	0-22	Silty clay loam	CL	A-7	0	100	100	100	85-100	40-50	20-30
	22-48	Silty clay loam, silty clay.	CH	A-7	0	100	100	95-100	90-100	50-65	30-42
	48-60	Stratified clay to silty clay loam.	CL, CH	A-7	0	100	100	90-100	85-100	40-55	20-32
Mh Moundhaven	0-9	Fine sandy loam	SM	A-4, A-2-4	0	100	100	60-85	30-50	<20	NP-3
	9-70	Stratified sand to fine sandy loam.	SW-SM, SM, SP-SM	A-3, A-2-4	0	100	95-100	50-80	5-35	<20	NP-3
MuA, MuB2 Muren	0-9	Silt loam	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-90	20-30	5-15
	9-54	Silty clay loam, silt loam.	CL	A-6, A-4	0	100	100	90-100	80-100	25-35	8-15
	54-80	Silt loam, silt	CL, CL-ML, ML	A-4	0	100	100	90-100	70-90	<25	NP-10
Nk Newark	0-9	Silty clay loam	CL	A-6	0	95-100	90-100	85-100	80-95	30-40	11-20
	9-60	Silt loam, silty clay loam.	ML, CL, CL-ML	A-4, A-6, A-7	0	95-100	90-100	85-100	70-100	22-42	3-20
	60-80	Silt loam, silty clay loam.	ML, CL, CL-ML	A-4, A-6, A-7	0-3	75-100	70-100	65-100	55-95	22-42	3-20
Nn, No Nolin	0-10	Silt loam	CL, CL-ML	A-4, A-6	0	100	95-100	90-100	80-100	25-40	5-18
	10-61	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6, A-7	0	100	95-100	85-100	75-100	25-46	5-23
	61-80	Loam, silt loam, sandy loam.	ML, CL, CL-ML, GM	A-4, A-6	0-10	50-100	50-100	40-95	35-95	<30	NP-15
Pn Patton	0-23	Silty clay loam	CL	A-6	0	100	100	95-100	75-95	30-40	15-25
	23-57	Silty clay loam, silt loam.	CL, CH, ML, MH	A-7	0	100	100	95-100	75-100	40-55	15-25
	57-70	Stratified silt loam to silty clay loam.	CL	A-6	0	100	100	95-100	75-95	25-40	10-20
Po Peoga	0-19	Silt loam	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-100	25-40	5-15
	19-65	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	95-100	85-100	35-50	20-30
	65-75	Stratified silty clay loam to silt loam.	CL, ML	A-6, A-7	0	100	100	90-100	70-95	35-50	10-25
Pp Petrolia	0-11	Silt loam	CL, ML	A-6, A-7, A-4	0	100	95-100	80-95	75-90	30-45	5-20
	11-33	Silty clay loam	ML, CL	A-6, A-7	0	100	95-100	90-100	80-100	35-50	10-25
	33-60	Silty clay loam, silt loam.	CL	A-4, A-6, A-7	0	100	95-100	80-100	60-100	20-45	8-20
Pv Petrolia	0-8	Silty clay loam	CL	A-6, A-7	0	100	95-100	90-100	80-100	30-45	12-20
	8-51	Silty clay loam	ML, CL	A-6, A-7	0	100	95-100	90-100	80-100	35-50	10-25
	51-80	Silty clay loam, silt loam.	CL	A-4, A-6, A-7	0	100	95-100	80-100	60-100	20-45	8-20
Pw*. Pits											

See footnote at end of table.

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Ra	0-20	Silt loam	CL	A-4, A-6	0	100	100	90-100	70-100	20-30	7-12
Ragsdale	20-56	Silty clay loam, silt loam.	CL	A-6, A-4	0	100	100	90-100	80-95	25-35	8-13
	56-60	Silt loam	CL-ML, ML, CL	A-4	0	100	100	90-100	70-90	<25	3-8
Rb	0-14	Silt loam	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-90	20-30	5-11
Ragsdale	14-30	Silt loam	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-90	20-30	5-11
	30-50	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-90	20-35	5-15
	50-60	Silt loam	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-90	20-30	5-11
RlA	0-21	Silt loam	ML, CL-ML	A-4	0	100	90-100	90-100	85-100	25-35	4-10
Reesville	21-52	Silty clay loam, silt loam.	CL, CL-ML	A-6, A-7, A-4	0	100	90-100	90-100	90-100	20-50	4-28
	52-60	Silt loam	CL, CL-ML	A-4, A-6	0	100	90-100	85-100	80-90	20-40	4-20
Rr	0-9	Fine sandy loam	SM-SC, SC, CL, CL-ML	A-4	0	100	100	70-85	40-55	<25	5-8
Rensselaer	9-52	Clay loam, sandy clay loam, sandy loam.	CL	A-6, A-7	0	100	95-100	85-100	70-90	33-47	15-26
	52-60	Clay loam, loam	CL	A-6, A-7	0	100	100	85-100	70-90	33-47	15-26
SbA	0-11	Loam	CL-ML, CL	A-4, A-6	0	100	95-100	80-100	55-95	25-35	7-15
Skelton	11-60	Clay loam, sandy clay loam.	CL, SC, SM, ML	A-6, A-7	0	100	95-100	75-100	35-80	35-45	10-20
	60-70	Clay loam, sandy clay loam.	CL, SC	A-2-6, A-6	0	100	95-100	75-100	30-80	25-40	10-20
ScA	0-9	Silt loam	CL-ML, CL	A-4, A-6	0	100	95-100	80-100	55-95	25-35	7-15
Skelton	9-53	Clay loam, sandy clay loam, silty clay loam.	CL, SC, SM, ML	A-6, A-7	0	100	95-100	75-100	35-80	35-45	10-20
	53-60	Clay loam, sandy clay loam, sandy loam.	CL, SC	A-2-6, A-6	0	100	95-100	75-100	30-80	25-40	10-20
Sf	0-9	Silt loam	ML	A-4	0	95-100	90-100	80-100	55-95	<35	NP-10
Steff	9-41	Silt loam, silty clay loam.	ML, CL, CL-ML	A-4, A-6	0	95-100	90-100	85-100	70-95	20-40	3-20
	41-60	Silt loam, gravelly loam, very fine sandy loam.	ML, CL-ML, SM, GM	A-4, A-2, A-1	0-10	50-100	40-100	35-95	20-90	<35	NP-10
Sr	0-10	Silt loam	CL, CL-ML	A-4, A-6	0	100	100	90-100	75-90	25-40	5-15
Stendal	10-60	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	100	100	90-100	75-90	25-40	5-15
SvC	0-6	Silt loam	CL-ML, ML	A-4	0	90-100	90-100	90-100	65-90	<25	3-7
Swanwick Variant	6-34	Silt loam, silty clay loam.	CL	A-4, A-6	0	90-100	85-100	80-100	60-95	20-40	7-20
	34-60	Extremely shaly silt loam.	GP, GM, GP-GM, GM-GC	A-1	30-60	15-30	5-25	5-25	3-25	<25	NP-5
SyB2, SyC3	0-6	Silt loam	CL-ML, CL	A-4, A-6	0	100	100	100	95-100	25-35	5-15
Sylvan	6-17	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	100	95-100	35-50	20-30
	17-60	Silt loam, silt	CL, CL-ML	A-6, A-4	0	100	100	95-100	95-100	20-40	5-20

See footnote at end of table.

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
SyD, SyF--------- Sylvan	0-3	Silt loam---------	CL-ML, CL	A-4, A-6	0	100	100	100	95-100	25-35	5-15
	3-7	Silt loam---------	CL, ML	A-4, A-6	0	100	100	100	95-100	30-40	7-15
	7-22	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	100	95-100	35-50	20-30
	22-60	Silt loam, silt	CL, CL-ML	A-6, A-4	0	100	100	95-100	95-100	20-40	5-20
TaD3------------- Taftown	0-3	Silt loam---------	ML, CL-ML	A-4	0	100	100	90-100	70-90	<25	NP-7
	3-31	Silt loam---------	CL-ML, CL	A-4	0	100	95-100	90-100	70-90	20-30	5-10
	31-41	Loam, silt loam, silty clay loam.	CL, CL-ML	A-6, A-4	0-3	90-100	75-100	60-100	50-90	25-35	5-15
	41	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
TaE-------------- Taftown	0-9	Silt loam---------	ML, CL-ML	A-4	0	100	100	90-100	70-90	<25	NP-7
	9-29	Silt loam---------	CL-ML, CL	A-4	0	100	95-100	90-100	70-90	20-30	5-10
	29-49	Loam, silt loam	CL, CL-ML	A-6, A-4	0-3	90-100	75-100	60-100	50-90	25-35	5-15
	49-64	Silt loam, loam	CL, CL-ML	A-6, A-4	0-3	90-100	75-100	60-100	50-90	25-35	5-15
	64	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Ud. Udorthents											
UmD3*: Udorthents.											
Sylvan----------	0-4	Silt loam---------	CL-ML, CL	A-4, A-6	0	100	100	100	95-100	25-35	5-15
	4-24	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	100	95-100	35-50	20-30
	24-60	Silt loam---------	CL, CL-ML	A-6, A-4	0	100	100	95-100	95-100	20-40	5-20
UnA-------------- Uniontown	0-11	Silt loam---------	CL-ML, CL	A-4	0	100	100	90-100	70-90	18-25	4-8
	11-42	Silt loam---------	CL-ML, CL	A-4, A-6	0	100	100	90-100	70-90	20-30	5-11
	42-60	Silt loam---------	CL-ML, CL, ML	A-4, A-6	0	100	100	90-100	70-90	16-30	3-11
UnB2------------- Uniontown	0-9	Silt loam---------	ML, CL-ML, CL	A-4	0	100	95-100	90-100	80-100	20-35	2-10
	9-39	Silt loam, silty clay loam.	CL, ML	A-6, A-4, A-7	0	100	95-100	90-100	85-100	30-45	7-20
	39-60	Silt loam, silty clay loam.	ML, CL	A-4, A-6, A-7	0	90-100	90-100	85-100	75-100	30-45	7-20
UnB3, UnC3------- Uniontown	0-5	Silt loam---------	CL	A-6, A-7	0	100	95-100	90-100	85-100	35-45	15-22
	5-35	Silt loam, silty clay loam.	CL, ML	A-6, A-4, A-7	0	100	95-100	90-100	85-100	30-45	7-20
	35-60	Silt loam, silty clay loam, silt.	ML, CL	A-4, A-6, A-7	0	90-100	90-100	85-100	75-100	30-45	7-20
Vn--------------- Vincennes	0-15	Loam--------------	CL	A-6	0	100	90-100	75-100	60-90	25-35	10-20
	15-49	Clay loam, sandy clay loam, loam.	CL, SC	A-6, A-4	0	100	90-100	60-100	35-80	25-40	8-15
	49-60	Stratified clay loam to sandy loam.	SC, CL, SM-SC, CL-ML	A-6, A-4	0	100	85-100	50-80	40-65	20-35	5-15
Vo--------------- Vincennes	0-18	Silt loam---------	CL	A-4, A-6	0	100	100	90-100	70-90	25-30	8-12
	18-65	Clay loam, sandy clay loam, loam.	CL, SC	A-6	0	100	100	80-100	35-80	30-40	10-16
	65-80	Sandy clay loam, clay loam.	CL, SC, CL-ML, SM-SC	A-4, A-6	0	100	100	80-100	35-55	25-40	5-16

See footnote at end of table.

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Wa	0-6	Silt loam	ML	A-4	0	100	100	90-100	80-90	27-36	4-10
Wakeland	6-65	Silt loam	ML	A-4	0	100	100	90-100	80-90	27-36	4-10
Wk	0-7	Silt loam	ML, CL-ML	A-4	0	100	100	90-100	70-90	<25	3-7
Wilbur	7-60	Silt loam	ML, CL-ML	A-4	0	100	100	90-100	70-90	<25	3-7
Wo	0-8	Silty clay	CH, CL, ML, MH	A-7	0	100	100	95-100	90-95	40-55	15-25
Wilhite	8-36	Silty clay, silty clay loam.	CL	A-6, A-7	0	100	100	95-100	85-95	35-50	15-25
	36-60	Silty clay, silty clay loam.	CL	A-6, A-7	0	100	100	90-100	85-95	35-50	15-25
Wr	0-16	Silt loam	CL-ML, ML	A-4	0	95-100	90-100	80-100	65-90	<25	3-7
Wirt	16-24	Loam, sandy loam, fine sandy loam.	CL-ML, ML	A-4	0	95-100	90-100	75-100	55-90	<25	3-7
	24-60	Stratified sand to loamy fine sand.	SP, SP-SM, SM	A-1, A-3, A-2-4, A-4	0-5	85-100	50-100	25-95	2-50	<25	NP-4
Zp	0-9	Silty clay	CL, CH	A-7, A-6	0	100	100	95-100	90-95	35-55	20-30
Zipp	9-46	Clay, silty clay	CL, CH	A-7	0	100	100	95-100	90-95	45-60	25-35
	46-60	Clay, silty clay	CL, CH	A-7	0	100	100	90-100	75-95	45-60	25-35

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

(The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated)

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	g/cc	In/hr	In/in	pH					Pct
Ad*:											
Adrian	0-34	---	0.30-0.55	0.2-6.0	0.35-0.45	5.1-7.8			2	2	55-75
	34-60	2-10	1.40-1.75	6.0-20	0.03-0.08	5.6-8.4	Low				
Rensselaer	0-9	15-25	1.00-1.25	0.6-2.0	0.20-0.22	6.1-7.3	Low	0.20	5	3	8-14
	9-24	20-35	1.40-1.60	0.6-2.0	0.15-0.19	6.1-7.3	Moderate	0.32			
	24-48	27-30	1.40-1.60	0.6-2.0	0.16-0.18	6.6-7.8	Moderate	0.32			
	48-60	8-20	1.50-1.70	0.6-2.0	0.10-0.18	7.4-8.4	Low	0.32			
AlA, AlB2	0-12	12-26	1.25-1.40	0.6-2.0	0.22-0.24	3.6-7.3	Low	0.37	5	5	.5-4
Alford	12-70	22-30	1.35-1.50	0.6-2.0	0.18-0.20	3.6-6.0	Moderate	0.37			
	70-80	8-20	1.30-1.45	0.6-2.0	0.20-0.22	4.5-7.3	Low	0.37			
AlB3	0-7	18-26	1.25-1.40	0.6-2.0	0.22-0.24	3.6-7.3	Low	0.37	5	5	.5-2
Alford	7-52	18-30	1.35-1.50	0.6-2.0	0.18-0.20	3.6-6.0	Moderate	0.37			
	52-60	8-20	1.30-1.45	0.6-2.0	0.20-0.22	4.5-7.3	Low	0.37			
AlC2	0-12	12-26	1.25-1.40	0.6-2.0	0.22-0.24	3.6-7.3	Low	0.37	5	5	.5-2
Alford	12-70	22-30	1.35-1.50	0.6-2.0	0.18-0.20	3.6-6.0	Moderate	0.37			
	70-80	8-20	1.30-1.45	0.6-2.0	0.20-0.22	4.5-7.3	Low	0.37			
AlC3	0-7	18-26	1.25-1.40	0.6-2.0	0.22-0.24	3.6-7.3	Low	0.37	5	5	.5-2
Alford	7-52	18-30	1.35-1.50	0.6-2.0	0.18-0.20	3.6-6.0	Moderate	0.37			
	52-80	8-20	1.30-1.45	0.6-2.0	0.20-0.22	4.5-7.3	Low	0.37			
AlD2	0-12	12-26	1.25-1.40	0.6-2.0	0.22-0.24	3.6-7.3	Low	0.37	5	5	.5-2
Alford	12-70	22-30	1.35-1.50	0.6-2.0	0.18-0.20	3.6-6.0	Moderate	0.37			
	70-75	8-20	1.30-1.45	0.6-2.0	0.20-0.22	4.5-7.3	Low	0.37			
AlD3	0-7	18-26	1.25-1.40	0.6-2.0	0.22-0.24	3.6-7.3	Low	0.37	5	5	.5-2
Alford	7-52	18-30	1.35-1.50	0.6-2.0	0.18-0.20	3.6-6.0	Moderate	0.37			
	52-80	8-20	1.30-1.45	0.6-2.0	0.20-0.22	4.5-7.3	Low	0.37			
AlE	0-12	12-26	1.25-1.40	0.6-2.0	0.22-0.24	3.6-7.3	Low	0.37	5	5	.5-2
Alford	12-70	22-30	1.35-1.50	0.6-2.0	0.18-0.20	3.6-6.0	Moderate	0.37			
	70-80	8-20	1.30-1.45	0.6-2.0	0.20-0.22	4.5-7.3	Low	0.37			
AmF*:											
Alford	0-12	12-26	1.25-1.40	0.6-2.0	0.22-0.24	3.6-7.3	Low	0.37	5	5	.5-2
	12-70	22-30	1.35-1.50	0.6-2.0	0.18-0.20	3.6-6.0	Moderate	0.37			
	70-80	8-20	1.30-1.45	0.6-2.0	0.20-0.22	4.5-7.3	Low	0.37			
Parke	0-8	18-27	1.25-1.40	0.6-2.0	0.22-0.24	5.1-7.3	Low	0.37	5	5	.5-2
	8-27	22-27	1.30-1.45	0.6-2.0	0.18-0.20	4.5-6.0	Moderate	0.37			
	27-80	18-30	1.55-1.65	0.6-2.0	0.16-0.18	4.5-6.0	Low	0.28			
AnB, AnC2	0-9	10-15	1.45-1.65	2.0-6.0	0.14-0.20	4.5-7.3	Low	0.24	5	3	.5-1
Alvin	9-38	15-18	1.45-1.65	0.6-2.0	0.12-0.20	4.5-6.5	Low	0.24			
	38-70	3-10	1.55-1.75	2.0-6.0	0.05-0.13	5.1-7.8	Low	0.24			
AnC3	0-5	10-15	1.45-1.65	2.0-6.0	0.14-0.20	4.5-7.3	Low	0.24	5	3	.5-1
Alvin	5-36	15-18	1.45-1.65	0.6-2.0	0.12-0.20	4.5-6.5	Low	0.24			
	36-60	3-10	1.55-1.75	2.0-6.0	0.05-0.13	5.1-7.8	Low	0.24			

See footnote at end of table.

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	g/cc	In/hr	In/in	pH					Pct
AnD2----------	0-6	10-15	1.45-1.65	2.0-6.0	0.14-0.20	4.5-7.3	Low----------	0.24	5	3	.5-1
Alvin	6-36	15-18	1.45-1.65	0.6-2.0	0.12-0.20	4.5-6.5	Low----------	0.24			
	36-60	3-10	1.55-1.75	2.0-6.0	0.05-0.13	5.1-7.8	Low----------	0.24			
AnD3----------	0-4	10-15	1.45-1.65	2.0-6.0	0.14-0.20	4.5-7.3	Low----------	0.24	5	3	.5-1
Alvin	4-32	15-18	1.45-1.65	0.6-2.0	0.12-0.20	4.5-6.5	Low----------	0.24			
	32-60	3-10	1.55-1.75	2.0-6.0	0.05-0.13	5.1-7.8	Low----------	0.24			
Ao.											
Aquents											
Ar, As----------	0-18	20-26	1.30-1.45	0.6-2.0	0.21-0.23	6.1-7.3	Moderate-----	0.28	5	6	2-4
Armiesburg	18-60	20-30	1.30-1.45	0.6-2.0	0.18-0.20	6.1-7.8	Moderate-----	0.28			
Ay----------	0-8	3-10	1.45-1.55	0.6-2.0	0.16-0.18	5.6-7.3	Low----------	0.24	5	3	.5-1
Ayrshire Variant	8-14	3-10	1.45-1.55	0.6-2.0	0.16-0.18	5.6-7.3	Low----------	0.24			
	14-54	10-20	1.40-1.60	0.6-2.0	0.15-0.19	5.1-6.5	Low----------	0.32			
	54-80	10-15	1.55-1.70	0.6-2.0	0.14-0.16	5.6-6.5	Low----------	0.24			
Bd----------	0-12	15-25	1.20-1.40	0.2-0.6	0.22-0.24	5.6-7.8	Low----------	0.43	5	6	1-3
Birds	12-80	18-27	1.40-1.60	0.2-0.6	0.20-0.22	5.1-7.8	Low----------	0.43			
B1A, B1B, B1C,											
B1D, B1F--------	0-8	2-10	1.60-1.80	6.0-20	0.07-0.09	5.1-7.3	Low----------	0.15	5	1	.5-2
Bloomfield	8-30	2-10	1.60-1.80	6.0-20	0.06-0.11	5.1-7.3	Low----------	0.15			
	30-80	5-13	1.60-1.80	2.0-20	0.05-0.10	5.1-7.8	Low----------	0.15			
Bo----------	0-8	18-27	1.20-1.40	0.6-2.0	0.22-0.24	4.5-7.3	Low----------	0.43	5	6	1-3
Bonnie	8-17	18-27	1.40-1.60	0.2-0.6	0.20-0.22	4.5-5.5	Low----------	0.43			
	17-60	18-30	1.45-1.65	0.2-0.6	0.18-0.20	4.5-7.8	Low----------	0.43			
Bp----------	0-4	18-27	1.20-1.40	0.6-2.0	0.22-0.24	4.5-6.5	Low----------	0.43	5	6	1-2
Bonnie	4-60	18-27	1.40-1.60	0.2-0.6	0.20-0.22	4.5-7.8	Low----------	0.43			
Cg----------	0-6	10-27	1.20-1.40	0.6-2.0	0.20-0.24	5.6-7.3	Low----------	0.32	5	5	2-4
Chagrin	6-46	18-27	1.20-1.50	0.6-2.0	0.14-0.20	5.6-7.3	Low----------	0.32			
	46-60	5-25	1.20-1.40	0.6-2.0	0.08-0.20	5.6-7.3	Low----------	0.32			
Cr----------	0-9	10-20	1.35-1.50	0.6-2.0	0.20-0.22	5.6-6.5	Low----------	0.32	5	5	1-2
Crawleyville	9-37	18-30	1.40-1.65	0.6-2.0	0.16-0.19	4.5-6.0	Low----------	0.32			
	37-50	10-20	1.50-1.65	0.6-2.0	0.11-0.16	4.5-5.5	Low----------	0.24			
	50-60	8-15	1.50-1.65	0.6-2.0	0.11-0.16	4.5-5.5	Low----------	0.24			
Du*.											
Dumps											
EkA, EkB---------	0-10	7-18	1.30-1.45	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.37	5	5	.5-2
Elkinsville	10-26	19-30	1.40-1.60	0.6-2.0	0.18-0.22	4.5-5.5	Moderate-----	0.37			
	26-80	14-30	1.40-1.60	0.6-2.0	0.11-0.20	4.5-6.0	Low----------	0.37			
Ev----------	0-9	20-26	1.30-1.45	0.6-2.0	0.20-0.24	6.1-7.3	Low----------	0.37	5	5	1-3
Evansville	9-40	25-34	1.40-1.55	0.6-2.0	0.18-0.20	6.1-7.8	Moderate-----	0.37			
	40-65	25-34	1.40-1.55	0.6-2.0	0.19-0.21	6.6-8.4	Low----------	0.37			
FaG----------	0-5	18-27	1.40-1.55	0.6-2.0	0.09-0.18	5.6-7.3	Low----------	0.37	5	6	<.5
Fairpoint	5-60	18-27	1.60-1.80	0.2-0.6	0.03-0.10	5.6-7.3	Moderate-----	0.37			
GnF----------	0-8	10-18	1.20-1.40	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.37	2	5	2-4
Gilpin Variant	8-16	15-25	1.30-1.50	0.6-2.0	0.20-0.22	5.1-7.3	Low----------	0.37			
	16-34	18-27	1.40-1.65	0.6-2.0	0.15-0.20	5.1-7.3	Low----------	0.37			
	34	---	---	---	---	---	----------	----			

See footnote at end of table.

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	g/cc	In/hr	In/in	pH					Pct
GuC3, GuD3------- Gudgel	0-6	16-24	1.35-1.45	0.6-2.0	0.21-0.23	5.6-6.5	Low----------	0.43	3	5	.5-1
	6-12	20-27	1.35-1.45	0.6-2.0	0.20-0.22	4.5-6.0	Low----------	0.43			
	12-29	20-27	1.70-1.75	0.06-0.2	0.06-0.08	4.5-6.0	Low----------	0.43			
	29-51	27-35	1.40-1.50	0.2-0.6	0.06-0.08	6.1-7.3	Low----------	0.43			
	51	---	---	---	---	---	----------	----			
Hd----------	0-8	10-18	1.30-1.45	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.37	5	5	1-3
Haymond	8-45	10-18	1.30-1.45	0.6-2.0	0.20-0.22	5.6-7.3	Low----------	0.37			
	45-60	10-18	1.30-1.45	0.6-2.0	0.20-0.22	6.1-7.3	Low----------	0.37			
HhA----------	0-7	12-20	1.20-1.45	0.6-2.0	0.22-0.24	6.1-7.3	Low----------	0.37	5	5	1-2
Henshaw Variant	7-11	20-27	1.50-1.65	0.2-0.6	0.20-0.22	5.6-7.3	Low----------	0.37			
	11-40	32-40	1.50-1.65	0.2-0.6	0.18-0.20	5.6-7.3	Moderate-----	0.37			
	40-60	20-27	1.20-1.45	0.2-0.6	0.20-0.22	7.4-8.4	Low----------	0.37			
HoB2----------	0-8	10-17	1.20-1.40	0.6-2.0	0.22-0.24	4.5-6.5	Low----------	0.43	4	5	1-2
Hosmer	8-23	24-30	1.30-1.50	0.6-2.0	0.18-0.22	4.5-5.5	Moderate-----	0.43			
	23-80	16-30	1.60-1.70	<0.06	0.06-0.08	4.5-6.0	Low----------	0.43			
HoB3----------	0-7	10-17	1.20-1.40	0.6-2.0	0.22-0.24	4.5-6.5	Low----------	0.43	4	5	.5-1
Hosmer	7-14	24-30	1.30-1.50	0.6-2.0	0.18-0.22	4.5-5.5	Moderate-----	0.43			
	14-80	16-30	1.60-1.70	<0.06	0.06-0.08	4.5-6.0	Low----------	0.43			
HoC----------	0-8	10-17	1.20-1.40	0.6-2.0	0.22-0.24	4.5-6.5	Low----------	0.43	4	5	1-2
Hosmer	8-23	24-30	1.30-1.50	0.6-2.0	0.18-0.22	4.5-5.5	Moderate-----	0.43			
	23-80	16-30	1.60-1.70	<0.06	0.06-0.08	4.5-6.0	Low----------	0.43			
HoC3----------	0-7	10-17	1.20-1.40	0.6-2.0	0.22-0.24	4.5-6.5	Low----------	0.43	4	5	.5-1
Hosmer	7-14	24-30	1.30-1.50	0.6-2.0	0.18-0.22	4.5-5.5	Moderate-----	0.43			
	14-80	16-30	1.60-1.70	<0.06	0.06-0.08	4.5-6.0	Low----------	0.43			
IvA, IvB----------	0-18	18-27	1.25-1.40	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.43	4	5	1-3
Iva	18-49	22-30	1.35-1.55	0.6-2.0	0.18-0.20	4.5-6.5	Moderate-----	0.43			
	49-60	10-20	1.35-1.55	0.6-2.0	0.20-0.22	5.1-6.5	Low----------	0.43			
Ju----------	0-8	3-15	1.55-1.70	0.6-2.0	0.10-0.12	6.1-7.3	Low----------	0.17	5	2	1-3
Junius Variant	8-19	3-15	1.65-1.70	0.6-2.0	0.08-0.11	6.1-7.3	Low----------	0.17			
	19-46	10-20	1.55-1.70	0.6-2.0	0.12-0.17	6.1-7.3	Low----------	0.24			
	46-60	1-10	1.65-1.70	0.6-2.0	0.05-0.08	6.1-7.3	Low----------	0.15			
La----------	0-16	7-20	1.40-1.60	2.0-6.0	0.13-0.20	6.1-8.4	Low----------	0.20	5	3	2-4
Landes	16-40	5-18	1.45-1.70	2.0-6.0	0.10-0.15	6.1-8.4	Low----------	0.20			
	40-70	5-18	1.60-1.80	6.0-20	0.05-0.15	6.1-8.4	Low----------	0.20			
Ln----------	0-7	15-27	1.20-1.40	0.6-2.0	0.20-0.26	5.1-7.8	Low----------	0.32	5	6	2-4
Lindside	7-60	18-35	1.20-1.40	0.2-2.0	0.17-0.22	5.1-7.8	Low----------	0.37			
	60-70	18-35	1.20-1.40	0.2-6.0	0.12-0.18	5.6-7.8	Low----------	0.32			
Ly----------	0-24	7-20	1.40-1.60	0.6-2.0	0.16-0.18	5.1-7.3	Low----------	0.20	5	3	2-4
Lyles	24-51	10-27	1.50-1.70	0.6-2.0	0.14-0.19	6.1-7.8	Low----------	0.20			
	51-60	0-10	1.30-1.50	2.0-6.0	0.14-0.16	6.1-7.8	Low----------	0.15			
Lz----------	0-11	10-20	1.30-1.50	0.6-2.0	0.15-0.17	5.6-7.3	Low----------	0.20	5	3	1-3
Lyles	11-34	10-20	1.50-1.70	0.6-2.0	0.14-0.16	6.1-7.3	Low----------	0.20			
	34-62	15-22	1.50-1.70	0.6-2.0	0.13-0.17	6.1-7.3	Low----------	0.20			
	62-70	20-27	1.50-1.70	0.6-2.0	0.15-0.17	6.6-7.3	Low----------	0.32			
Ma----------	0-26	10-18	1.25-1.40	0.6-2.0	0.22-0.24	6.1-7.3	Low----------	0.37	5	5	1-3
Maplehill	26-47	12-20	1.40-1.55	0.6-2.0	0.20-0.22	6.1-7.3	Low----------	0.37			
	47-80	18-30	1.45-1.65	0.6-2.0	0.20-0.22	6.6-8.4	Moderate-----	0.37			

See footnote at end of table.

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	g/cc	In/hr	In/in	pH					Pct
Md, Me	0-19	18-27	1.20-1.45	0.6-2.0	0.17-0.22	6.1-7.8	Low	0.32	5	6	3-6
Medway	19-57	18-32	1.20-1.50	0.6-2.0	0.17-0.19	6.1-8.4	Low	0.32			
	57-70	5-30	1.20-1.60	0.6-6.0	0.15-0.19	6.1-8.4	Low	0.32			
Mg	0-22	35-40	1.35-1.55	0.2-0.6	0.20-0.23	6.1-7.8	High	0.37	5	7	3-6
Montgomery	22-48	35-55	1.45-1.65	0.06-0.2	0.11-0.18	6.1-7.8	High	0.37			
	48-60	35-48	1.50-1.70	0.06-0.2	0.18-0.20	7.4-8.4	Moderate	0.37			
Mh	0-9	4-10	1.50-1.60	6.0-20	0.13-0.18	7.4-8.4	Low	0.24	5	3	.5-2
Moundhaven	9-70	1-8	1.50-1.65	6.0-20	0.06-0.11	7.4-8.4	Low	0.17			
MuA, MuB2	0-9	15-27	1.25-1.40	0.6-2.0	0.22-0.24	5.1-7.3	Low	0.37	5	5	.5-2
Muren	9-54	22-30	1.35-1.50	0.6-2.0	0.18-0.20	5.1-7.3	Moderate	0.37			
	54-80	8-20	1.30-1.45	0.6-2.0	0.20-0.22	5.6-7.3	Low	0.37			
Nk	0-9	27-35	1.20-1.40	0.6-2.0	0.18-0.22	5.6-7.8	Low	0.37	5	7	1-4
Newark	9-60	18-35	1.20-1.45	0.6-2.0	0.18-0.23	5.6-7.8	Low	0.43			
	60-80	12-40	1.30-1.50	0.6-2.0	0.15-0.22	5.6-7.8	Low	0.43			
Nn, No	0-10	12-27	1.20-1.40	0.6-2.0	0.18-0.23	5.6-8.4	Low	0.43	5	5	2-4
Nolin	10-61	18-35	1.25-1.50	0.6-2.0	0.18-0.23	5.6-8.4	Low	0.43			
	61-80	10-27	1.30-1.55	0.6-6.0	0.10-0.23	5.1-8.4	Low	0.43			
Pn	0-23	27-35	1.15-1.35	0.6-2.0	0.21-0.23	6.6-7.3	Moderate	0.28	5	7	3-5
Patton	23-57	22-35	1.25-1.45	0.6-2.0	0.18-0.20	6.1-7.8	Moderate	0.28			
	57-70	22-35	1.30-1.50	0.2-0.6	0.18-0.22	7.4-8.4	Moderate	0.28			
Po	0-19	15-26	1.30-1.45	0.6-2.0	0.20-0.24	4.5-7.3	Low	0.43	5	5	1-2
Peoga	19-65	19-34	1.40-1.60	0.06-0.2	0.18-0.20	4.5-5.5	Moderate	0.43			
	65-75	20-34	1.40-1.60	0.06-0.2	0.19-0.21	4.5-6.5	Low	0.43			
Pp	0-11	20-27	1.25-1.45	0.2-0.6	0.22-0.24	5.6-8.4	Low	0.32	5	6	1-3
Petrolia	11-33	27-35	1.35-1.45	0.2-0.6	0.18-0.20	6.1-7.3	Moderate	0.32			
	33-60	20-35	1.40-1.60	0.2-0.6	0.18-0.20	4.5-7.8	Moderate	0.32			
Pv	0-8	27-35	1.20-1.40	0.2-0.6	0.21-0.23	5.6-8.4	Moderate	0.32	5	7	2-3
Petrolia	8-51	27-35	1.35-1.45	0.2-0.6	0.18-0.20	6.1-7.3	Moderate	0.32			
	51-80	20-35	1.40-1.60	0.2-0.6	0.18-0.20	4.5-7.8	Moderate	0.32			
Pw*.											
Pits											
Ra	0-20	18-25	1.50-1.70	0.6-2.0	0.22-0.24	6.1-7.3	Low	0.28	5	5	4-6
Ragsdale	20-56	20-30	1.50-1.70	0.6-2.0	0.18-0.20	6.1-7.3	Moderate	0.28			
	56-60	10-20	1.50-1.70	0.6-2.0	0.20-0.22	7.4-8.4	Low	0.28			
Rb	0-14	15-25	1.25-1.45	0.6-2.0	0.22-0.24	6.1-7.3	Low	0.37	5	5	.5-2
Ragsdale	14-30	18-27	1.40-1.60	0.6-2.0	0.20-0.22	6.1-7.3	Low	0.37			
	30-50	18-30	1.50-1.70	0.6-2.0	0.18-0.22	6.1-7.3	Moderate	0.37			
	50-60	15-25	1.40-1.60	0.6-2.0	0.20-0.22	7.4-8.4	Low	0.37			
RlA	0-21	12-20	1.20-1.45	0.6-2.0	0.17-0.24	5.1-7.3	Low	0.37	5	5	2-4
Reesville	21-52	24-35	1.30-1.55	0.6-2.0	0.17-0.22	5.1-7.8	Moderate	0.37			
	52-60	20-25	1.30-1.60	0.6-2.0	0.15-0.20	6.6-8.4	Low	0.37			
Rr	0-9	15-20	1.30-1.40	0.6-2.0	0.16-0.18	5.6-7.3	Low	0.20	5	3	2-3
Rensselaer	9-52	15-35	1.40-1.60	0.6-2.0	0.15-0.19	6.1-7.3	Moderate	0.24			
	52-60	20-35	1.50-1.70	0.6-2.0	0.14-0.16	6.6-8.4	Moderate	0.24			

See footnote at end of table.

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	g/cc	In/hr	In/in	pH					Pct
SbA----------	0-11	15-25	1.20-1.45	0.6-2.0	0.20-0.24	5.1-7.3	Low----------	0.32	5	5	1-2
Skelton	11-60	27-35	1.40-1.60	0.6-2.0	0.15-0.19	4.5-5.5	Moderate-----	0.32			
	60-70	20-30	1.50-1.65	0.6-2.0	0.14-0.17	4.5-6.0	Low----------	0.32			
ScA----------	0-9	15-25	1.20-1.45	0.6-2.0	0.20-0.24	5.1-7.3	Low----------	0.32	5	5	1-2
Skelton	9-53	27-35	1.40-1.60	0.6-2.0	0.15-0.19	4.5-5.5	Moderate-----	0.32			
	53-60	18-30	1.50-1.65	0.6-2.0	0.14-0.17	4.5-6.0	Low----------	0.32			
Sf----------	0-9	12-25	1.30-1.50	0.6-2.0	0.15-0.23	4.5-7.3	Low----------	0.43	5	5	1-2
Steff	9-41	12-34	1.30-1.55	0.6-2.0	0.18-0.23	4.5-5.5	Low----------	0.43			
	41-60	10-25	1.40-1.65	0.6-2.0	0.08-0.21	4.5-5.5	Low----------	0.43			
Sr----------	0-10	18-27	1.30-1.45	0.6-2.0	0.22-0.24	4.5-7.3	Low----------	0.37	5	5	1-3
Stendal	10-60	18-35	1.45-1.65	0.6-2.0	0.20-0.22	4.5-5.5	Low----------	0.37			
SvC----------	0-6	10-18	1.30-1.50	0.2-0.6	0.22-0.24	5.6-7.3	Low----------	0.37	2	5	.5-1
Swanwick Variant	6-34	18-35	1.70-1.80	0.2-0.6	0.08-0.10	5.6-7.3	Moderate-----	0.37			
	34-60	5-20	1.60-1.70	2.0-6.0	0.01-0.05	6.6-8.4	Low----------	0.28			
SyB2, SyC3-------	0-6	20-27	1.20-1.40	0.6-2.0	0.20-0.22	5.6-7.3	Low----------	0.37	5	6	.5-2
Sylvan	6-17	25-35	1.30-1.50	0.6-2.0	0.18-0.20	5.6-7.3	Moderate-----	0.37			
	17-60	10-27	1.30-1.50	0.6-2.0	0.20-0.22	6.6-8.4	Low----------	0.37			
SyD, SyF---------	0-3	18-27	1.20-1.40	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.37	5	6	1-2
Sylvan	3-7	15-25	1.25-1.45	0.6-2.0	0.20-0.22	5.6-7.3	Low----------	0.37			
	7-22	25-35	1.30-1.50	0.6-2.0	0.18-0.20	5.6-7.3	Moderate-----	0.37			
	22-60	10-27	1.30-1.50	0.6-2.0	0.20-0.22	6.6-8.4	Low----------	0.37			
TaD3----------	0-3	5-15	1.35-1.45	0.6-2.0	0.22-0.24	5.1-6.5	Low----------	0.37	3	5	1-2
Taftown	3-31	12-18	1.45-1.60	0.6-2.0	0.18-0.22	4.5-6.0	Low----------	0.37			
	31-41	15-28	1.40-1.65	0.6-2.0	0.15-0.20	4.5-6.0	Low----------	0.37			
	41	---	---	---	---	---	----------	----			
TaE----------	0-9	5-15	1.35-1.45	0.6-2.0	0.22-0.24	5.1-6.5	Low----------	0.37	3	5	1-2
Taftown	9-29	12-18	1.45-1.60	0.6-2.0	0.18-0.22	4.5-6.0	Low----------	0.37			
	29-49	15-25	1.40-1.65	0.6-2.0	0.15-0.20	4.5-6.0	Low----------	0.37			
	49-64	15-25	1.40-1.65	0.6-2.0	0.15-0.20	5.6-6.0	Low----------	0.37			
	64	---	---	---	---	---	----------	----			
Ud.											
Udorthents											
UmD3*:											
Udorthents.											
Sylvan----------	0-4	20-27	1.20-1.40	0.6-2.0	0.20-0.22	5.6-7.3	Low----------	0.37	5	6	.5-2
	4-24	25-35	1.30-1.50	0.6-2.0	0.18-0.20	5.6-7.3	Moderate-----	0.37			
	24-60	18-27	1.30-1.50	0.6-2.0	0.20-0.22	6.6-8.4	Low----------	0.37			
UnA----------	0-11	12-20	1.30-1.50	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.37	5	5	.5-2
Uniontown	11-42	15-25	1.40-1.55	0.6-2.0	0.20-0.22	5.6-8.4	Low----------	0.37			
	42-60	10-25	1.40-1.50	0.2-0.6	0.20-0.22	7.4-8.4	Low----------	0.37			
UnB2----------	0-9	12-20	1.20-1.40	0.6-2.0	0.19-0.33	5.6-7.3	Low----------	0.37	5	5	.5-2
Uniontown	9-39	18-35	1.20-1.40	0.6-2.0	0.18-0.22	5.6-8.4	Low----------	0.37			
	39-60	10-30	1.20-1.40	0.2-2.0	0.18-0.22	6.6-8.4	Low----------	0.37			
UnB3, UnC3-------	0-5	18-27	1.20-1.40	0.6-2.0	0.18-0.22	5.6-7.3	Low----------	0.37	4	7	.5-1
Uniontown	5-35	18-35	1.20-1.40	0.6-2.0	0.18-0.22	5.6-8.4	Low----------	0.37			
	35-60	10-30	1.20-1.40	0.2-2.0	0.18-0.22	6.6-8.4	Low----------	0.37			

See footnote at end of table.

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	g/cc	In/hr	In/in	pH					Pct
Vn	0-15	15-25	1.30-1.45	0.6-2.0	0.20-0.24	5.1-7.3	Low	0.37	5	5	1-3
Vincennes	15-49	20-33	1.40-1.60	0.06-0.2	0.15-0.19	4.5-6.5	Moderate	0.37			
	49-60	15-35	1.50-1.70	0.2-0.6	0.15-0.20	5.1-7.3	Low	0.37			
Vo	0-18	20-27	1.30-1.40	0.6-2.0	0.22-0.24	5.1-7.3	Low	0.37	5	6	1-3
Vincennes	18-65	20-35	1.40-1.60	0.06-0.2	0.15-0.19	4.5-6.5	Moderate	0.37			
	65-80	20-35	1.50-1.70	0.2-0.6	0.15-0.17	5.6-6.0	Moderate	0.37			
Wa	0-6	10-17	1.30-1.50	0.6-2.0	0.22-0.24	5.6-7.3	Low	0.37	5	5	1-3
Wakeland	6-65	10-17	1.30-1.50	0.6-2.0	0.20-0.22	5.6-7.3	Low	0.37			
Wk	0-7	10-17	1.30-1.45	0.6-2.0	0.22-0.24	5.6-7.3	Low	0.37	5	5	1-3
Wilbur	7-60	10-17	1.30-1.45	0.6-2.0	0.20-0.22	5.6-7.3	Low	0.37			
Wo	0-8	40-50	1.40-1.45	0.06-0.2	0.12-0.14	5.1-6.0	High	0.32	5	4	1-3
Wilhite	8-36	35-45	1.40-1.65	0.06-0.2	0.08-0.18	5.1-6.5	Moderate	0.32			
	36-60	35-45	1.40-1.65	<0.06	0.08-0.18	5.1-6.5	Moderate	0.32			
Wr	0-16	10-18	1.30-1.45	0.6-2.0	0.17-0.20	5.6-7.3	Low	0.37	5	5	.5-3
Wirt	16-24	7-18	1.40-1.55	0.6-2.0	0.15-0.20	5.6-7.3	Low	0.24			
	24-60	3-12	1.25-1.50	2.0-20	0.03-0.10	5.6-7.3	Low	0.17			
Zp	0-9	40-45	1.40-1.55	0.2-2.0	0.12-0.21	5.6-7.3	High	0.28	5	4	1-3
Zipp	9-46	40-55	1.55-1.70	0.06-0.2	0.11-0.13	5.6-7.3	High	0.28			
	46-60	40-50	1.55-1.70	<0.2	0.08-0.10	6.6-8.4	High	0.28			

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 18.--SOIL AND WATER FEATURES

("Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
Ad*:												
Adrian	A/D	None	---	---	+1-1.0	Apparent	Nov-May	>60	---	High	High	Moderate.
Rensselaer	B/D	None	---	---	+.5-1.0	Apparent	Dec-May	>60	---	High	Moderate	Low.
AlA, AlB2, AlB3, AlC2, AlC3, AlD2, AlD3, AlE--- Alford	B	None	---	---	>6.0	---	---	>60	---	High	Moderate	High.
AmF*:												
Alford	B	None	---	---	>6.0	---	---	>60	---	High	Moderate	High.
Parke	B	None	---	---	>6.0	---	---	>60	---	High	Moderate	High.
AnB, AnC2, AnC3, AnD2, AnD3--- Alvin	B	None	---	---	>6.0	---	---	>60	---	Moderate	Low	High.
Ao. Aquents												
Ar--- Armiesburg	B	Occasional	Brief	Oct-Jun	>6.0	---	---	>60	---	High	Moderate	Low.
As--- Armiesburg	B	Rare	---	---	>6.0	---	---	>60	---	High	Moderate	Low.
Ay--- Ayrshire Variant	B	None	---	---	1.0-3.0	Apparent	Jan-May	>60	---	High	Moderate	Moderate.
Bd--- Birds	C/D	Frequent	Long	Mar-Jun	+.5-1.0	Apparent	Mar-Jun	>60	---	High	High	Moderate.
BlA, BlB, BlC, BlD, BlF--- Bloomfield	A	None	---	---	>6.0	---	---	>60	---	Low	Low	High.
Bo--- Bonnie	C/D	Frequent	Brief to long.	Jan-Jun	+.5-1.0	Apparent	Jan-Jun	>60	---	High	High	High.
Bp--- Bonnie	C	Frequent	Very long	Oct-Jul	+1-0.5	Apparent	Oct-Jul	>60	---	High	Moderate	High.

See footnote at end of table.

TABLE 18.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
Cg---------- Chagrin	B	Frequent----	Brief-----	Nov-May	4.0-6.0	Apparent	Feb-Mar	>60	---	Moderate	Low------	Moderate.
Cr---------- Crawleyville	B	None--------	---	---	1.0-3.0	Apparent	Dec-May	>60	---	High-----	High-----	High.
Du*. Dumps												
EkA, EkB---------- Elkinsville	B	None--------	---	---	>6.0	---	---	>60	---	High-----	Moderate	High.
Ev---------- Evansville	B/D	None--------	---	---	+.5-1.0	Apparent	Jan-May	>60	---	High-----	High-----	Low.
FaG---------- Fairpoint	C	None--------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Moderate.
GnF---------- Gilpin Variant	C	None--------	---	---	>6.0	---	---	20-40	Soft	Moderate	Low------	High.
GuC3, GuD3-------- Gudgel	C	None--------	---	---	1.0-2.0	Perched	Dec-Apr	40-60	Soft	High-----	Moderate	High.
Hd---------- Haymond	B	Frequent----	Brief-----	Jan-May	>6.0	---	---	>60	---	High-----	Low------	Low.
HhA---------- Henshaw Variant	C	Frequent----	Brief-----	Feb-Apr	1.0-2.0	Apparent	Jan-May	>60	---	High-----	High-----	Moderate.
HoB2, HoB3, HoC, HoC3---------- Hosmer	C	None--------	---	---	2.5-3.0	Perched	Mar-Apr	>60	---	High-----	Moderate	High.
IvA, IvB---------- Iva	C	None--------	---	---	1.0-3.0	Apparent	Jan-Apr	>60	---	High-----	High-----	Moderate.
Ju---------- Junius Variant	B	None--------	---	---	0.5-1.5	Apparent	Dec-May	>60	---	Moderate	High-----	Moderate.
La---------- Landes	B	Occasional	Brief-----	Jan-Jun	>6.0	---	---	>60	---	Moderate	Low------	Low.
Ln---------- Lindside	C	Frequent----	Very brief to brief.	Dec-Apr	1.5-3.0	Apparent	Dec-Apr	>60	---	High-----	Moderate	Low.
Ly, Lz---------- Lyles	B/D	None--------	---	---	+.5-1.0	Apparent	Dec-May	>60	---	High-----	High-----	Low.

See footnote at end of table.

TABLE 18.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
Ma---------- Maplehill	C	Frequent----	Very brief	Feb-May	1.0-2.0	Apparent	Dec-May	>60	---	High-----	High-----	Low.
Md---------- Medway	B	Occasional	Very brief to long.	Nov-Jun	1.5-3.0	Apparent	Jan-Apr	>60	---	High-----	High-----	Low.
Me---------- Medway	B	Rare--------	---	---	1.5-3.0	Apparent	Jan-Apr	>60	---	High-----	High-----	Low.
Mg---------- Montgomery	D	None--------	---	---	+1-1.0	Apparent	Dec-May	>60	---	High-----	High-----	Low.
Mh---------- Moundhaven	A	Frequent----	Very brief	Nov-May	>6.0	---	---	>60	---	Low------	Low------	Low.
MuA, MuB2--------- Muren	B	None--------	---	---	2.0-6.0	Apparent	Mar-Apr	>60	---	High-----	High-----	Moderate.
Nk---------- Newark	C	Frequent----	Brief to long.	Jan-Apr	0.5-1.5	Apparent	Dec-May	>60	---	High-----	High-----	Low.
Nn---------- Nolin	B	Rare--------	---	---	3.0-6.0	Apparent	Feb-Mar	>60	---	High-----	Low------	Moderate.
No---------- Nolin	B	Frequent----	Brief to long.	Feb-May	3.0-6.0	Apparent	Feb-Mar	>60	---	High-----	Low------	Moderate.
Pn---------- Patton	B/D	None--------	---	---	+.5-2.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Low.
Po---------- Peoga	C	None--------	---	---	0-1.0	Apparent	Jan-May	>60	---	High-----	High-----	High.
Pp, Pv---------- Petrolia	C/D	Frequent----	Brief to long.	Mar-Jun	+.5-3.0	Apparent	Apr-Jun	>60	---	High-----	High-----	Low.
Pw*. Pits												
Ra---------- Ragsdale	B/D	None--------	---	---	+.5-1.0	Apparent	Dec-May	>60	---	High-----	High-----	Low.
Rb---------- Ragsdale	B	None--------	---	---	+.5-1.0	Apparent	Dec-May	>60	---	High-----	High-----	Low.
RlA---------- Reesville	C	None--------	---	---	1.0-2.5	Perched	Jan-Apr	>60	---	High-----	High-----	Moderate.

See footnote at end of table.

TABLE 18.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
Rr---------- Rensselaer	C	None---------	---	---	+.5-1.0	Apparent	Nov-May	>60	---	High-----	High-----	Low.
SbA---------- Skelton	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Moderate.
ScA---------- Skelton	B	Frequent----	Brief-----	Feb-Apr	>6.0	---	---	>60	---	Moderate	Moderate	Moderate.
Sf---------- Steff	C	Frequent----	Brief-----	Dec-Apr	1.5-3.0	Apparent	Dec-Apr	>60	---	High-----	Moderate	High.
Sr---------- Stendal	C	Frequent----	Brief to very long.	Jan-May	1.0-3.0	Apparent	Jan-Apr	>60	---	High-----	High-----	High.
SvC---------- Swanwick Variant	C	None---------	---	---	>6.0	---	---	>60	---	High-----	Moderate	Moderate.
SyB2, SyC3, SyD, SyF---------- Sylvan	B	None---------	---	---	>6.0	---	---	>60	---	High-----	Moderate	Moderate.
TaD3, TaE--------- Taftown	B	None---------	---	---	>6.0	---	---	40-70	Soft	High-----	Moderate	High.
Ud. Udorthents												
UmD3*: Udorthents.												
Sylvan----------	B	None---------	---	---	>6.0	---	---	>60	---	High-----	Moderate	Moderate.
UnA---------- Uniontown	B	None---------	---	---	2.5-4.0	Apparent	Nov-May	>60	---	High-----	Low------	Moderate.
UnB2, UnB3, UnC3-- Uniontown	B	None---------	---	---	2.5-6.0	Apparent	Nov-May	>60	---	High-----	Low------	Moderate.
Vn---------- Vincennes	C/D	None---------	---	---	+.5-1.0	Apparent	Jan-May	>60	---	High-----	High-----	High.
Vo---------- Vincennes	C/D	Frequent----	Brief-----	Feb-Apr	+.5-1.0	Apparent	Jan-May	>60	---	High-----	High-----	High.
Wa---------- Wakeland	C	Frequent----	Brief to long.	Jan-May	1.0-3.0	Apparent	Jan-Apr	>60	---	High-----	High-----	Low.

See footnote at end of table.

TABLE 18.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
Wk---------- Wilbur	B	Frequent----	Brief-----	Oct-Jun	1.5-3.0	Apparent	Mar-Apr	>60	---	High-----	Moderate	Moderate.
Wo---------- Wilhite	C/D	Frequent----	Brief-----	Dec-Jun	+.5-1.0	Apparent	Dec-May	>60	---	Moderate	High-----	Moderate.
Wr---------- Wirt	B	Frequent----	Very brief	Dec-May	>6.0	---	---	>60	---	Moderate	Low------	Moderate.
Zp---------- Zipp	D	None--------	---	---	+.5-1.0	Apparent	Dec-May	>60	---	Moderate	High-----	Low.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 19.--CLASSIFICATION OF THE SOILS

(An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series)

Soil name	Family or higher taxonomic class
Adrian	Sandy or sandy-skeletal, mixed, euic, mesic Terric Medisaprists
*Alford	Fine-silty, mixed, mesic Typic Hapludalfs
*Alvin	Coarse-loamy, mixed, mesic Typic Hapludalfs
Aquents	Mixed, mesic Fluvaquents
Armiesburg	Fine-silty, mixed, mesic Fluventic Hapludolls
Ayrshire Variant	Coarse-loamy, mixed, mesic Aeric Ochraqualfs
Birds	Fine-silty, mixed, nonacid, mesic Typic Fluvaquents
Bloomfield	Sandy, mixed, mesic Psammentic Hapludalfs
*Bonnie	Fine-silty, mixed, acid, mesic Typic Fluvaquents
Chagrin	Fine-loamy, mixed, mesic Dystric Fluventic Eutrochrepts
Crawleyville	Fine-loamy, mixed, mesic Aeric Ochraqualfs
*Elkinsville	Fine-silty, mixed, mesic Ultic Hapludalfs
Evansville	Fine-silty, mixed, nonacid, mesic Typic Haplaquepts
Fairpoint	Loamy-skeletal, mixed, nonacid, mesic Typic Udorthents
Gilpin Variant	Fine-loamy, mixed, mesic Typic Hapludalfs
Gudgel	Fine-silty, mixed, mesic Aquic Fragiudalfs
Haymond	Coarse-silty, mixed, nonacid, mesic Typic Udifluvents
Henshaw Variant	Fine-silty, mixed, mesic Aeric Ochraqualfs
Hosmer	Fine-silty, mixed, mesic Typic Fragiudalfs
Iva	Fine-silty, mixed, mesic Aeric Ochraqualfs
Junius Variant	Coarse-loamy, mixed, mesic Typic Haplaquepts
Landes	Coarse-loamy, mixed, mesic Fluventic Hapludolls
Lindside	Fine-silty, mixed, mesic Fluvaquentic Eutrochrepts
Lyles	Coarse-loamy, mixed, mesic Typic Haplaquolls
Maplehill	Coarse-silty, mixed, nonacid, mesic Aeric Fluvaquents
*Medway	Fine-loamy, mixed, mesic Fluvaquentic Hapludolls
Montgomery	Fine, mixed, mesic Typic Haplaquolls
*Moundhaven	Sandy, mixed, mesic Typic Udifluvents
Muren	Fine-silty, mixed, mesic Aquic Hapludalfs
Newark	Fine-silty, mixed, nonacid, mesic Aeric Fluvaquents
Nolin	Fine-silty, mixed, mesic Dystric Fluventic Eutrochrepts
Parke	Fine-silty, mixed, mesic Ultic Hapludalfs
Patton	Fine-silty, mixed, mesic Typic Haplaquolls
Peoga	Fine-silty, mixed, mesic Typic Ochraqualfs
Petrolia	Fine-silty, mixed, nonacid, mesic Typic Fluvaquents
*Ragsdale	Fine-silty, mixed, mesic Typic Argiaquolls
Reesville	Fine-silty, mixed, mesic Aeric Ochraqualfs
*Rensselaer	Fine-loamy, mixed, mesic Typic Argiaquolls
Skelton	Fine-loamy, mixed, mesic Typic Hapludalfs
Steff	Fine-silty, mixed, mesic Fluvaquentic Dystrochrepts
Stendal	Fine-silty, mixed, acid, mesic Aeric Fluvaquents
Swanwick Variant	Fine-silty, mixed, nonacid, mesic Typic Udorthents
Sylvan	Fine-silty, mixed, mesic Typic Hapludalfs
Taftown	Coarse-silty, mixed, mesic Typic Hapludalfs
Udorthents	Loamy, mixed, mesic Udorthents
Udorthents, cut and filled	Mesic Udorthents
Uniontown	Fine-silty, mixed, mesic Typic Hapludalfs
Vincennes	Fine-loamy, mixed, nonacid, mesic Typic Haplaquepts
Wakeland	Coarse-silty, mixed, nonacid, mesic Aeric Fluvaquents
Wilbur	Coarse-silty, mixed, nonacid, mesic Aquic Udifluvents
Wilhite	Fine, mixed, nonacid, mesic Typic Fluvaquents
Wirt	Coarse-loamy, mixed, nonacid, mesic Typic Udifluvents
Zipp	Fine, mixed, nonacid, mesic Typic Haplaquepts

☆ U.S. GOVERNMENT PRINTING OFFICE : 1989 O - 205-551

NRCS Accessibility Statement

This document is not accessible by screen-reader software. The Natural Resources Conservation Service (NRCS) is committed to making its information accessible to all of its customers and employees. If you are experiencing accessibility issues and need assistance, please contact our Helpdesk by phone at 1-800-457-3642 or by e-mail at ServiceDesk-FTC@ftc.usda.gov. For assistance with publications that include maps, graphs, or similar forms of information, you may also wish to contact our State or local office. You can locate the correct office and phone number at http://offices.sc.egov.usda.gov/locator/app.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.